3rd International Conference

Women in Science & Technology : Creating Sustainable Career

(ICWSTCSC:2023)

December 28-30, 2023

Souvenir

Organized by:

CHARUTAR VIDYA MANDAL'S

BVM ENGINEERING COLLEGE

[An Autonomous Institution]

Affiliated to Gujarat Technological University

Vallabh Vidyanagar, Anand, Gujarat, India-388120

(ICWSTCSC:2016)

(ICWSTCSC:2018)

3rd International Conference

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BIRLA VISHVAKARMA MAHAVIDYALAYA ENGINEERING COLLEGE

An Autonomous Institution

(Managed by Charutar Vidya Mandal)
Affiliated to Gujarat Technological University
Vallabh Vidyanagar – 388120, Anand, Gujarat, India

3RD INTERNATIONAL CONFERENCE ON WOMEN IN SCIENCE & TECHNOLOGY: CREATING SUSTAINABLE CAREER (ICWSTCSC:2023) DECEMBER 28-30, 2023

Editor's

Dr. Indrajit N Patel
Dr. Jagdish M Rathod
Dr. Darshankumar C Dalwadi
Dr. Mukesh E Shimpi
Dr. Darshana Bhatt
Prof. Jagruti Shah

Inquiries for bulk sales may be solicited at mahibookpublication@gmail.com

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3rd International Conference

Women in Science & Technology : Creating Sustainable Career

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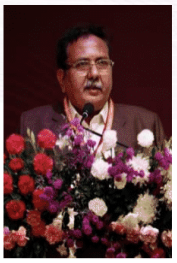

Preface

It is with immense pride and a profound sense of responsibility that I, as the Principal of BVM Engineering College, present the preface for our International Conference on Women in Science and Technology: Creating Sustainable Careers.

At the heart of this conference lies our unwavering commitment to fostering an environment where women in science and technology not only thrive but also lead the way towards a future driven by innovation and equity. This conference is not just an event; it is a testament to our dedication to breaking down barriers and building bridges for women in these critical fields.

As we navigate the complexities of the 21st century, the role of women in science and technology has never been more crucial. They bring unique perspectives, diverse skills, and invaluable insights to the table. Yet, the path towards achieving a sustainable career in these fields is often fraught with challenges. This conference aims to address these challenges head-on, offering a platform for discourse, networking, and the sharing of best practices.

Through a series of keynotes, panel discussions, and workshops led by eminent personalities and trailblazers, we endeavor to highlight the success stories, discuss the hurdles, and explore the myriad opportunities available for women in these dynamic sectors. We also aim to foster collaborations and partnerships that transcend geographical boundaries, encouraging a global dialogue on the empowerment of women in science and technology.

BVM Engineering College is proud to be at the forefront of this vital conversation. We believe that empowering women in science and technology is not just about gender equality; it's about driving forward the engine of human progress. As we gather some of the brightest minds from around the world, we look forward to insightful discussions, meaningful exchanges, and actionable outcomes that will pave the way for a more inclusive and sustainable future.

Let us embark on this journey together, with the shared vision of creating a world where every woman in science and technology can realize her full potential, unimpeded by the barriers of the past and empowered by the possibilities of the future.

About Charutar Vidya Mandal (CVM)

One of the greatest sons of India, Late Sardar Vallabhbhai Patel inspired Shri Bhaikaka and Shri Bhikabhai Saheb for rural resurgence of post-independent India through education, and Charutar Vidya Mandal was born. Charutar Vidya Mandal was established in the year 1945 as a charitable trust with a prime objective of rural development through education to bring out the social awakening, social upliftment and enrichment. The uniqueness of Charutar Vidya Mandal lies in its ability to use quality education as a powerful means of social transformation.

It was a stupendous task for the founders to establish a visionary organization; but the large-heartedness and high sense of philanthropy of this region made this possible. Over the subsequent years, Dr. H M Patel consolidated the efforts put in by the founders.

Later on, in the 1990s, when Late Shri Dr. C. L. Patel took over the reins of Charutar Vidya Mandal as the Chairman, the country was facing a major economic and ideological change paving the way for globalization and liberalization. This generated two major challenges before the sector of education - (a) Withdrawal of monetary support by the government to educational institutions, and (b) Need for new programs and courses to meet with the emerging demands arising out of a globalized and liberalized world in science and technology and in business.

Various self-financed educational institutions started being established in the areas of Technology, Science and Engineering, Commerce and Management, offering emerging and innovative courses and programs such as Mechatronics, Automobile Engineering, Bio-technology, Food Processing Technology, E-Commerce, Valuation, etc. The dynamic leadership, missionary zeal and visionary outlook of Er. Bhikhubhai Patel successfully took up the CVM on new benchmark. His unique leadership style attracts many philanthropists to contribute to the development of Charutar Vidya Mandal.

The twin campuses of Vallabh Vidyanagar and New Vallabh Vidyanagar of Charutar Vidya Mandal are shining examples of an institution serving the community in the field of education and contributing to the improvement of the quality of life of the people. Today Charutar Vidya Mandal is empowering budding graduates to live up to the ever-changing environment and equipping them to face the Third Millennium with confidence and competence. Building competitive advantages is the renewed focus of Charutar Vidya Mandal in the 21st century. At present, Charutar Vidya Mandal operates more than 48 Educational Institutions from schools to colleges, and a sophisticated Research Institute, with over 40,000 students on the rolls.

*About Birla Vishvakarma Mahavidyalaya (*BVM)

"The future of India lies in its Villages" with the vision of Mahatma Gandhiji, Birla Vishvakarma Mahavidyalaya (BVM), has established having the prime objective of the institute is rural development through education to bring about the social awakening, social upliftment, and enrichment. Institute functions under the aegis of Charutar Vidya Mandal (CVM), is the **first engineering college** of the state of Gujarat, established in 1948, with the inspiration and motivation from Iron Man of India Shri Sardar Vallabhai Patel and a generous contribution from Shri Ghansyamdasji Birla and inaugurated by His Excellency Lord Mountbatten. Majority programs of BVM are awarded Accreditation by NBA, AICTE and recently, Institute is accredited with NAAC.

Meritorious students of Gujarat (Upto rank 2000) take the admission in BVM. This premier technical institution has nurtured 20,000+ engineers and continuously evolved with the facilities like best infrastructure, state of art Laboratories upgraded with instruments and utility software packages, enriched library, central computing and net station, canteen, play field, gymnasium, medical facilities, hostel and residence quarters.

BVM has made its mark nationally and internationally by developing learners with passion and commitment to work in a global environment, capable of creativity, innovation, and entrepreneurship for nation building through state-of-the-art teaching, learning and mentoring experience. The OBE is practiced in true spirit resulting in more focused all-round development of our students. The mapping to the appropriate POs and COs is also done as per the Bloom's Taxonomy levels. Choice based credit system and facility of credit transfer of elective courses by MOOCS completed through NPTEL platform. Choice base credit transfer arrangements with foreign universities and one semester abroad arrangements through MOU with 12 foreign universities. Offering Minor and Honors Degree for eligible and meritorious students as per NEP 2020.

Institute is awarded prestigious World Bank Assistance Project TEQIP-II TEQIP-III state government projects like SSIP and many more appreciation award from Gujarat government and national technical bodies like AICTE, GTU for its remarkable contribution in the field of technical education. The Institute has established 5 Centre of Excellence in emerging field of Engineering and Technology.

It is one of the leading institutions across Gujarat which is renowned for its excellent placement record. 100+corporates visit the college for conducting Campus Interviews and all eligible students are placed through campus drive every year. Institute gain in good positions almost in co-curricular and extracurricular activities like technical events Ideathon/Hackathon/Project competitions, youth festivals, sport competitions at state, national and international level.

To make our engineers "INDUSTRY READY" according to the benchmark of Industry 4.0, Institute has established Industry institute interaction programme under which 1 faculty – 1 industry is collaborated to provide the industrial platform to the students and faculties. Number of MOUs are done between top industries at National/International level through which industry experts are giving their guidance and expertise for events like project expo, expert talks, seminars, workshops, industry tour etc. These programs have helped to achieve Academia- industry collaboration and Partnership for Innovation.

Institute is providing ample opportunities for the exposure to and interactions with international experts and global leaders in a variety of curricular, co- and extra- curricular activities for enrichment of learning experience through NCC, NSS, Professional chapters and SSIP cell. Institute is offering course curriculum with industry orientation and unique specialisations. Faculties of various department is contributing through R& D projects under different state level and international level funding Agencies. Faculties are also providing traditional consultancy in various sectors and firms.

Acharya Devvrat
Governor, Gujarat
Gandhinagar-382021

सत्यमेव जयते

आचार्य देवव्रत
राज्यपाल, गुजरात
गांधीनगर-३८२०२१

MESSAGE

I am delighted to extend my heartfelt congratulations on the successful execution of the "International Conference on Women in Science and Technology" at BVM Engineering College. This noteworthy initiative dedicated to empowering women in the realms of science and technology is truly inspiring.

I admire BVM Engineering College's dedication to promoting equality and inclusivity in technical education and research. It is commendable that you are dedicated to providing a platform for women to share their experiences, triumphs, and struggles.

I acknowledge and appreciate BVM Engineering College for organizing this conference and creating a forum for collaboration and idea sharing. Your commitment is invaluable, and as we work together to achieve gender parity in the rapidly advancing fields of science and technology, your dedication is crucial.

I wish BVM Engineering College, its students, faculty, and staff members all success in their future endeavours.

(Acharya Devvrat)

Bhupendra Patel

Chief Minister, Gujarat State

Dt. 20-11-2023

Message

Current era is the era of science and technology. The whole world has witnessed the growth of this field by leaps and bounds within last two decades. India has always been a land of Rishis like Aryabhatt, Bhaskaracharya who were thinkers and innovators with deep scientific urge and insight. Our scientists have made us proud by their priceless contribution in the development of the nation. Women are an important section of the workforce, particularly in the field of Science & Technology. Even though 'break in career' arising due to motherhood and family responsibilities cannot stop their desire to expertise in the field of Science and Technology and return to mainstream. When such development encompasses the people even at the fringe of the society, it becomes inclusive in real sense.

I am much pleased to learn that **3rd International Conference** on **"Women in Science & Technology: Creating Sustainable Career"** is being organized by the **Birla Vishvakarma Mahavidyalaya (BVM), Vallabh Vidyanagar** during **28th-30th December, 2023**. It is heartening to learn that this institute is organizing such events with a view to provide professional women in technological space that fuel innovation, facilitate and knowledge sharing to provide them support through highly interactive sessions designed to foster discussions and collaborations. I convey my best wishes to the organizing team of **BVM**, all the participants and stakeholders for grand success of the event and for a bright future ahead.

(Bhupendra Patel)

To,
Prof. (Dr.) Indrajitbhai N. Patel, *Principal,*
BVM Engineering College,
Nr. Shastri Ground, Vallabh Vidyanagar,
Dist. Anand-388120.
Email: principal@bvmengineering.ac.in,
jagruti.shah@bvmengineering.ac.in
Mo: 9714073963

Apro/ab/2023/11/20/rs

सत्यमेव जयते

Letter No. 463/2023
Dt. 13.12.2023

Message

I am delighted to learn that the 3rd International Conference on "Women in Science & Technology: Creating Sustainable Careers" is being organized by Birla Vishvakarma Mahavidhyala in Vallabh Vidhyanagar, Gujarat from 28 to 30 December 2023. Indian women are making remarkable strides and demonstrating excellence across various domains, including science, information and technology.

Hon'ble Prime Minister Shri Narendra Modi ji has consistently underscored the pivotal role of women in the progress and development of our nation, emphasizing their significance from local Panchayats to the halls of Parliament. Various developmental and welfare schemes in this direction substantiates this assertion. Gujarat Government under the leadership of our Hon'ble Chief Minister Shri Bhupendrabhai Patel is actively spearheading the creation of a conducive environment that ensures equal opportunities for women.

I am confident that this conference is dedicated to empowering women, offering a distinctive platform and exposure for them to contribute towards the betterment of themselves, their families, the economy and the society. This International Conference will serve as an exclusive platform for the advancement of all stakeholders, offering opportunities to contribute to the enhancement of the economy and society. Participants will have the chance to share and exchange ideas, as well as identify and discuss options for the overall development of women.

I encourage all participants to reaffirm the commitment to chart a course that opens up opportunities for sustainable careers for women in the realms of Science and Technology through the exploration of innovative ideas.

I extend my best wishes for a resounding success to the organizers and delegates of the conference.

RUSHIKESH PATEL
Minister,
Health & Family Welfare and Medical Education, Higher and Technical Education,
Law, Justice, Legislative & Parliamentary Affairs,
Government of Gujarat

SMT. BHANUBEN BABARIYA

No.: MIN/SJED,WCW/ VIP / 2023

Minister,
Social Justice and Empowerment,
Women and Child Welfare,
Government of Gujarat
Swarnim Sankul-1, 1st Floor,
Sachivalaya, Gandhinagar-382010

Date : 21 DEC 2023

Best Wishes

Dear Participants and Organizers,

I am honored to address this esteemed gathering at the International Conference on Women in Science and Technology, a commendable initiative hosted by **BVM Engineering College**. As the Minister of Women and Child Welfare, it brings me immense pride to witness such a significant event dedicated to the empowerment and advancement of women in the science and technology sectors.

The organization of this conference by BVM Engineering College is a testament to the institution's dedication to fostering an environment of inclusivity and equality in technical education and research. It underscores the pivotal role educational institutions play in shaping a future where women are integral and influential contributors to the fields of science and technology.

This conference is more than just an academic gathering; it is a beacon of inspiration and a catalyst for change. It provides a unique platform for women to share their experiences, challenges, and triumphs in the science and technology domains. Through this exchange, we not only celebrate the remarkable achievements of women but also identify and work towards dismantling the barriers that hinder their full participation and recognition in these fields.

I commend BVM Engineering College for their exceptional efforts in organizing this event. Your commitment to creating a forum where ideas can flourish and collaborations can be fostered is invaluable in our quest to achieve gender parity in science and technology.

To all the brilliant minds present, I encourage you to engage in meaningful discussions, form lasting connections, and harness the collective wisdom gathered here. Let this conference be a stepping stone towards building a more inclusive, diverse, and innovative scientific community.

Wishing you all a successful, enriching, and transformative conference experience.

Yours sincerly,

B M Babaliu.

(Bhanuben babariya)

Phone No. (Office) : 079-23256428 / 50131 / 55623 **Fax No. :** 079-23250135
E-mail : min-sj@gujarat.gov.in

Mukesh Kumar, IAS
Principal Secretary
(Higher & Technical Education)

Education Department
Government of Gujarat
Block No. 5, 8th Floor
Sardar Bhavan, New Sachivalaya
Gandhinagar - 382010.

Date : 13 DEC 2023

MESSAGE

I am glad to hear that **Birla Vishvakarma Mahavidyalaya** (An Autonomous Institution) managed by Charutar Vidya Mandal affiliated to Gujarat Technological University organizing **3rd International Conference** on **"Women in Science & Technology: Creating Sustainable Career" (ICWSTCSC:2023)** during 28-30 December,2023.

In today's world, women play a crucial and indispensable role in society. In addition to discussing policies and other measures of women's empowerment from an international perspective, I hope that ICWSTCSC: 2023 will bring together current research conducted by women scientists and technocrats and give you the chance to share your ideas, network, and collaboratively explore current and future research directions. This conference will give women a fantastic platform to voice their concerns about a diversification of ideas leading to a more expansive vision for the future. It also offers networking opportunities, inspiration, and motivation.

I extend my greetings and grand success to the organizer and the participants also wishes the conference all success.

(Shri Mukesh Kumar)

Tel. : 079-23251306, 23251308 Fax : 079-23254697 E-mail : secedu@gujarat.gov.in

BANCHHANIDHI PANI I.A.S.
Commissioner,
Technical Education

Government of Gujarat

Office of the Commissionerate of Technical Education
Block No. 2, 6th Floor,
Karmayogi Bhavan, Sector-10-A,
Gandhinagar-382010

Date :

MESSAGE

I am extremely glad to know that Birla Vishvakarma Mahavidyalaya College, Vallabh Vidyanagar is organizing 3rd International Conference on "Women in Science & Technology : Creating Sustainable Career" during 28-30 December,2023.

The role of women has changed considerably due to advancement of Technology. In today's world, – the modern era of mass communication and globalization, women actually are standing shoulder to shoulder with men in every field, I am sure that this conference will enable empowering women and to provide a unique platform & exposure to contribute towards the betterment of the society and self, which definitely is quite significant. I hope the conference will provide opportunity for early career professionals and aspiring leaders to nurture growth, networking and career development. Since the world is changing, people everywhere around the globe are continuously striving to shape the future in sustainable way.

My best wishes for the "Organizers and Delegates of the Conference" a grand success.

Banchhanidhi Pani, IAS

Commissioner, Commissionerate of Technical Education

Tel. : 079-23253546, 079-23253539 • E-mail : dire-dte@gujarat.gov.in

Dr. Rajul K. Gajjar
Vice Chancellor

GUJARAT TECHNOLOGICAL UNIVERSITY
VGEC Campus, Chandkheda,
Ahmedabad-382424, Gujarat, INDIA
Ph : +91-79-232 67527/622 Fax : +91-79-232 67 564
E-mail : vc@gtu.ac.in

Date: 07/11/2023

MESSAGE

It gives me immense pleasure to learn that Birla Vishvakarma Mahavidyalaya, Vallabh Vidyanagar is organizing the 3rd International Conference on "Women in Science & Technology: Creating Sustainable Career" (ICWSTCSC: 2023) during 28 - 30 December 2023 in collaboration with All India Council of Technical Education, Indian Society for Technical Education, NITs, reputed industries and Universities from Canada, Russia, Germany and Norway.

Women are now playing a vital role in science and technology. As we all know, India successfully landed Chandrayan-3 and The Prime Minister Shri of India highlighted the significant contributions of female scientists and engineers to the Chandrayaan-3 mission. It indicates that women are continuing to fulfill crucial roles in science and technology to the Nation.

This International Conference will aid in bringing together female professionals from industry, academia, research organizations, and research scholars with similar interests to share innovative concepts, experience, and information in many disciplines. This will also provide a platform for the development of all stakeholders, by providing them opportunities to contribute towards the betterment of the economy and society.

I congratulate the Principal, Organizers, and all stakeholders of BVM Engineering College for organizing the 3rd International Conference on "Women in Science & Technology: Creating Sustainable Career" (ICWSTCSC: 2023).

With best wishes,

Dr. Rajul K. Gajjar

To,
Dr. Indrajit Patel
Principal
BVM Engineering College,
Vallabh Vidyanagar- 388120.

Accredited with A+ Grade by NAAC

Er. Bhikhubhai B. Patel
CHAIRMAN

CHARUTAR VIDYA MANDAL
P. B. NO. 22, MOTA BAZAR, VALLABH VIDYANAGAR-388 120,
TA & DIST : ANAND, GUJARAT INDIA
PHONE : (O) 02692-238400
Website : www.ecvm.net e-mail : cvmandal@hotmail.com

MESSAGE

Dear Esteemed Participants,

As the Chairman of Charutar Vidya Mandal (CVM), I am delighted to extend my heartfelt greetings to all attendees of the **International Conference on Women in Science and Technology,** hosted by **BVM Engineering College**. This conference is a significant milestone in our collective journey towards amplifying the role and recognition of women in the vital fields of science and technology.

The collaboration between BVM Engineering College and CVM in organizing this event is a reflection of our shared vision and commitment to fostering gender equality and empowering women in the scientific community. BVM Engineering College's leadership in convening this international gathering is commendable and aligns perfectly with CVM's dedication to promoting inclusive education and professional growth.

This conference is not just an assembly of minds but a beacon of hope and inspiration. It is a platform where the challenges faced by women in science and technology are acknowledged and addressed, and where their achievements and contributions are celebrated. The diverse array of perspectives and experiences present here today is crucial for driving innovation, fostering collaboration, and ensuring a more equitable future in these dynamic fields.

I feel extremely happy for BVM Engineering College for their exemplary effort in organizing this conference. Your dedication to creating a space for dialogue, exchange, and inspiration is a testament to the positive impact educational institutions can have in shaping a more inclusive world.

To all the participants, I encourage you to seize this opportunity to engage, learn, and collaborate. Let us work together to build a scientific community where women are equally represented, where their contributions are valued, and where their potential is limitless.

I wish you all a very productive, edifying, and inspiring conference.

Warm regards,

[Er. Bhikhubhai Patel]
Chairman, Charutar Vidya Mandal

(1) V. P. & R. P. T. P. SCIENCE COLLEGE, (2) BIRLA VISHWAKARMA MAHAVIDYALAYA (ENGINEERING COLLEGE), (3) B. J. VANIJYA MAHAVIDYALAYA, (4) NALINI-ARVIND & T.V. PATEL ARTS COLLEGE, (5) H. M. PATEL INSTITUTE OF ENGLISH TRAINING & RESEARCH, (6) RAMA MANUBHAI DESAI COLLEGE OF MUSIC & DANCE, (7) S. M. PATEL COLLEGE OF HOME SCIENCE, (8) ARVINDBHAI PATEL INSTITUTE OF ENVIRONMENTAL DESIGN & H. M. PATEL INSTITUTE OF INTERIOR DESIGN, (9) A. R. COLLEGE & G. H. PATEL INSTITUTE OF PHARMACY, (10) SOPHISTICATED INSTRUMENTATION CENTRE FOR APPLIED RESEARCH & TESTING, (11) B. & B. INSTITUTE OF TECHNOLOGY, (12) IPCOWALA-SANTRAM COLLEGE OF FINE ARTS, (13) CHIMANBHAI M. U. PATEL INDUSTRIAL TRAINING CENTRE, (14) SARDAR PATEL RENEWABLE ENERGY RESEARCH INSTITUTE (SPRERI), (15) C.V.M. HIGHER SECONDARY EDUCATION COMPLEX-SCIENCE STREAM (R.P.T.P.), (16) C.V.M. HIGHER SECONDARY EDUCATION COMPLEX-GENERAL STREAM (T.V. PATEL), (17) C.V.M. HIGHER SECONDARY EDUCATION COMPLEX-VOCATIONAL STREAM (HOME SCIENCE), (18) I. B. PATEL ENGLISH SCHOOL (GIA), (19) I. B. PATEL ENGLISH SCHOOL (SFI), (20) G. J. SHARDA MANDIR, (21) M. U. PATEL TECHNICAL HIGH SCHOOL, (22) S. D. DESAI HIGH SCHOOL, (23) M. S. MISTRY PRIMARY SCHOOL, (24) V. & C. PATEL ENGLISH SCHOOL (CBSE), (25) SHARDABEN C. L. PATEL I. T. I. FOR WOMEN, (26) KANUBHAI M. PATEL ITI FOR ENGINEERING TRADES.
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CHAIRMAN : ER. BHIKHUBHAI B. PATEL
HON.SECRETARY : DR. SHANTIBHAI G. PATEL

CHARUTAR VIDYA MANDAL
P. B. NO. 22, MOTA BAZAR, VALLABH VIDYANAGAR-388 120,
TA & DIST : ANAND, GUJARAT INDIA
PHONE : (O) 02692-238400
Website : www.ecvm.net e-mail : cvmandal@hotmail.com

MESSAGE

Dear Esteemed Delegates and Participants,

I am writing with immense pride and enthusiasm as we gather for the **International Conference on Women in Science and Technology**, a landmark event graciously hosted by **BVM Engineering College**. As the Secretary of Charutar Vidya Mandal, it is a profound honor to be a part of an initiative that champions the role of women in the ever-evolving realms of science and technology.

This conference marks an essential milestone in our collective pursuit of equity and diversity within the scientific community. BVM Engineering College's role in orchestrating this event demonstrates a commendable commitment to fostering an environment where women in science and technology can thrive, breaking new ground and challenging the status quo.

The importance of such a conference cannot be overstated. It is a vibrant forum for sharing insights, debating challenges, and celebrating the significant strides women have made in these fields. Moreover, it serves as a powerful reminder of the work still needed to ensure equal opportunities and representation for women in science and technology.

I applaud the team at BVM Engineering College for their dedication and hard work in bringing this conference to fruition. Your efforts have created a valuable space for dialogue, collaboration, and inspiration, contributing significantly to the advancement of gender equality in science and technology.

To all the distinguished delegates and participants, I encourage you to make the most of this unique opportunity. Engage in the rich exchange of ideas, forge new partnerships, and let us collectively work towards a future where the contributions of women in science and technology are fully recognized and valued.

I wish you all an enlightening and successful conference, filled with fruitful discussions and meaningful connections.

Warm regards,

22.12.23

[Dr.S.G.Patel]
Hon. Secretary, Charutar Vidya Mandal

Acknowledgement

Many people have made significant contributions to the inception, organization and implementation of this women conference and they all deserve our heartfelt acknowledgement and appreciation for their contributions.

Our heartiest thanks to the parent institute **Charutar Vidya Mandal(CVM)**, Vallabh Vidyanagar for the valuable support to this International Conference.

We are highly indebted to Hon'ble **Er. Bhikhubhai B. Patel**, **Chairman**, CVM for his persistent and apt guidance with serenity, keeping us focused on our work.

We are thankful to **Gujarat Technological University (GTU)** for their support throughout this conference.

We are very much thankful to **All India Council for Technical Education** (AICTE), **Indian Society for Technical Education** (ISTE), and **Institution of Engineers, India** (IEI) for the encouragement provided.

We express our sincere thanks to **Commissionarate of Technical Education** (CTE), **Gujarat State**, **Department of Science and Technology**(DST), **Government of Gujarat, Gujarat Council of Science and Technology**(GUJCOST) for appreciating and acknowledging our work.

We are heartily thankful to our academic partners **Sardar Vallabhbhai National Institute of Technology**(SVNIT), **Sardar Patel University**, **OUS- Switzerland, ISHIK Univesity, WSU-Whichita State University, Ural Federal University-Russia, University of Prince Edward Island-Canada, Huazhong University of Science and Technology-China, Laurentain University-Canada, Wismar University-Germany, CPIT-New Zealand, Jiangsu University-China, Illinois Institute of technology- Chicago and Polzunov Altai State Technical University-Russia**.

We express our sincere thanks to **Smt. Bhanuben M. Babariya,** Hon'ble Minister of State, Women and Child Welfare, Social Justice and Empowerment, Govt. of Gujarat for unveiling the conference.

We are highly indebted to **Prof. Saroj Sharma**, Chairperson, National Institute for Open Schooling, MHRD, New Delhi, **Dr. Rajul Gajjar**, Vice Chancellor, Gujarat Technological University and **Shri Vipulbhai Patel,** Chairman, Amul for being distinguished guests of the conference.

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We extend our sincere thanks to **press and electronic media** for their support during the programs.

Above all, we would like to thank **everyone** who have been directly or indirectly involved and supported this Conference.

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3rd International Conference on

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Abstracts

1

An Offset Reflector Antenna with Dual Mode Feed: Effects of Pin Discontinuity on Wideband Crosspolarization Suppression

Balvant J. Makwana[1], Shahid Modasiya[2], Langhnoja Namrata V.[3], Keraliya Divyesh R.[4]
[1,2,3,4] Assistant Professor, EC Department, Government Engineering College, Rajkot, Gujarat, India

Abstract

The offset parabolic reflector generates very high cross-polarization due to its structural asymmetry when used with a linearly polarized primary feed. The higher level of crosspolarization in the far-field pattern results in loss of energy in unwanted polarization, which reduces the overall efficiency of the antenna system in many practical applications. To reduce the cross-polarization, asymmetrical higher order mode (TE21) is used along with TE11 with proper magnitude and phase. An oversized cylindrical waveguide horn is used to generate higherorder TE21 mode with odd numbers of discontinuities. This dualmode horn is then used as a primary feed to obtain secondary far-field radiation patterns from the offset reflector antenna. The radiation parameters of offset parabolic reflectors were analyzed for different numbers of pins in feed horns. On the basis of the analysis, a feed was designed and tested. The results of the measured and simulated experiments show excellent symmetry. It was possible to reduce cross-polarization over more than 15% of the bandwidth in comparison to an ideal Gaussian feed.

Keywords: Conjugate feed; Cross-polarizationt; cylidrical feed; Dual mode feed; Offset reflector

2

Experimental Study on Pile Behavior of various material and Soil Conditions under Uplift Load

Prof. Pratiti Bhatt[1], Dr.Khadija Priyan[2], Er. Snehal Patel[3], Dhruv Pandya[4]

[1] Structural Engineering Department, Birla Vishvakarma Mahavidhyalaya,V.V.nagar,Gujarat,India

[2] Professor & Head, Civil Engineering Department, G H Patel College of Engineering & Technology,Gujarat,India

[3]Principal Engineer, SuperCell Bharat, V.V. Nagar,Gujarat,India

[4]M.E. Student Structural Engineering Department, Birla Vishvakarma Mahavidhyalaya,V.V.nagar,Gujarat,India

Abstract

Due to wind, seismic events, wave action, or ship collisions, the foundations of various buildings, such as tall chimneys, transmission towers, mooring systems for ocean surface or submerged platforms, jetty structures, etc., are prone to overturning moments and uplift loads. Therefore, it is crucial to understand the pile's ability to carry uplift loads as well as the soil's propensity for failure under various soil conditions. Around the world, much study is being done to determine the uplift load bearingcapability of cylindrical and belled piles made of various materials. The aim of conducting laboratory test is to get idea about behaviorof different material of piles under pull out test as well as in different soil conditions. Furthermore, soil tests were also performed to get the soil parameters which are been used to for calculations. Soil test, namely Box shears test, Standard Proctor test and sand cone test. Pile materials which are used in this test are Concreteand Steel Pile.

Keywords: Pile foundation, Pull-out test, Displacement, Soil Conditions, Concrete Pile, Steel Pile

3

Women Safety Application

Devarshi Patel[1]
[1]Dharmsinh Desai University

Abstract

Technology has evolved into a priceless instrument for solving the issue of ensuring the protection and security of women in society. In-depth analysis and development of the women's safety application IamSafe, which has advanced features including SOS messages, location tracking, audio recording capabilities, and other key features, are presented in this research document. The proposed system offers a dependable and effective way to warn authorities and emergency contacts in stressful situations. A detailed assessment of the literature on current applications for women's safety and their shortcomings forms the basis of the research. It pinpoints the crucial areas where existing solutions fall short, which contributes to creating a solid and user-centered design for the proposed system.

Keywords: women safety; handset; coordinates; tracking; emergency situations; microphone; SOS messages

4

Estimation of wear volume of piston ring along the circumference using 3D modelling.

Kirti H Niralgikar[1], **Mukesh A. Bulsara**[2]
[1] Research Scholar, Chandulal S.Patel Institute of Technology, CHARUSAT, Changa, Gujarat
[2] Professor, Mechanical Engineering Department, GCET, Vallabh Vidyanagar, Anand, Gujarat

Abstract

Piston Ring of an I C Engine experiences wear as is usually experienced by all the components of an I C Engine. But the contribution of friction in a piston ring assembly is the maximum. Most wear models, have quantified wear of a piston ring in terms of total wear volume (Archard's wear equation), total weight loss or depth of the wear scar with an underlined assumption that wear is uniform along the circumference. This research work presents the comparison of results of wear calculation of the top piston ring of an IC Engine by measuring piston ring profile at 9 different angular sections, constituting 8 sectors of piston ring. Piston ring profile was measured over axial width of the worn-out piston ring at 13 different locations along the axial direction for each of the 9 sections. Volume loss for each of the 8 sectors is calculated by comparing piston ring profile of worn-out piston ring with profile of new piston ring of same type. The results have been compared with the software results (calculations done by CREO). The wear volume loss calculated by the analytical method has been compared with the results of CREO.The pattern of the wear volume loss in both the cases is the almost similar. It is observed that the wear volume loss is different for different sectors.

Keywords: Piston ring, Wear, Piston ring profile, Wear volume.

5

Determination of Mobilized Pile Capacity using Bi-directional Static Load Test

Prof. Pratiti Bhatt[1], Dr.Khadeeja Priyan[2], Er.Snehal Patel[3]

[1] Structural Department, Birla Vishvakarma Mahavidyalaya Engineering College, V.V.Nagar, Gujarat, India
[2] Professor & Head, Civil Engineering Department, G H Patel College of Engineering & Technology, Gujarat, India
[3] Principal Engineer, SuperCell भारत, V.V. Nagar, Gujarat, India.

Abstract

The bi-directional static load test ("BDSLT") is often used to test the geotechnical strength of deep foundations. These tests are performed on instrumented drilling foundations where applied loads, strains, and displacements are measured during the load test. When the test is complete, the measured data is analyzed to determine the parameters necessary to create the Equivalent Top Load ("ETL") curve. The bi-directional static load test is widely used to test drilled stems that conveniently provide strength on both the sides and the tip of the pile. However, extrapolation of the lateral and top drag motion curves is often required to determine the equivalent top-down, load-settling curve. In this research study, the loadcell was located at the bottom of the pile and the diameter of the pile was larger than the loadcell, so a bottom plate of diameter 1400 mm was provided, which was attached to the loadcell bottom. The pile diameter was 1400 mm and the pile height was 50.3 m. The design load acting on the pile was 7996 kN, the test load provided at the pile was 20003 kN and the bi-directional load applied on the pile was 10940 kN. In this research, the load was applied on the pile by using a bi-directional method, and the settlements of the loadcell top plate, loadcell bottom plate, and pile top were observed, with the help of field data obtained settlement and occurs the settlement curve using ETL Theory compare the results. The mobilized skin friction was also observed. Strain gauges were provided at different levels of the pile.

Key Words: Pile foundation, Settlement, Bi-directional Static Load Test, Mobilized Capacity, Load cell, Strain gauge
.

6

Applicability of Machine Learning Algorithms in Drug Formulation – A Literature Review

Hetalbahen Kiritkumar Dave[1], Dr. Tejas Thakkar[2], Dr. Vaishali Thakkar[3]

[1] Research Scholar, Charutar Vidya Mandal University, Vallabh Vidyanagar, Gujarat, 388120, India
[2] Department of Computer Science, Natubhai V. Patel College of Pure and Applied Sciences, Vallabh Vidhyanagar, Gujarat, 388120, India
[3] Department of Pharmaceutics, Anand Pharmacy College, Anand, 388001, India

Abstract

Artificial Intelligence (AI) is an emerging field with the potential to enhance various processes and outcomes. AI, particularly Machine Learning (ML), can simulate human-like thinking and intelligence through artificial systems. Within AI, Machine Learning involves creating models using data. In the pharmaceutical industry, drug formulation is a complex and resource-intensive process. AI, especially ML, offers a solution to streamline this process by optimizing cost, time, and accuracy. AI tools can be applied to catalyze drug formulation. Machine Learning algorithms can predict drug permeation through the skin, aiding the selection of optimal drug-delivery system combinations. ML can optimize transdermal formulation design by identifying the best mix of ingredients and delivery methods for desired therapeutic results. By analyzing data on drug properties, skin physiology, and more, ML expedites formulation development, reducing time and costs associated with traditional trial-and-error approaches. Machine Learning models can predict potential adverse effects of drug permeation and recommend formulations for improved efficacy and safety. Recent research has shown various machine learning algorithms, including Artificial Neural Networks, Convolutional Neural Networks, and Random Forest, being used for drug formulation optimization over the past decade. This highlights the current importance of AI in pharmaceutical research and its potential to reshape drug development.

Keywords: Algorithm, Machine Learning, Artificial Neural Network, Supervised Learning, Unsupervised Learning, Drug Formulation.

7

Career of Women Academicians in Engineering: A Case Study of Gujarat, India

Prof. Nikita P. Desai[1], Srushti Pednekar[2], Ananya Kulkarni[3], Maitri Shah[4]
[1,2,3,4] Dept of IT, Dharmsinh Desai University, Nadiad, Gujarat, India

Abstract

Teaching is a highly skilled profession accessible to women in many countries, including India. Good communication skills and effective teaching are essential for academic success. Gender does not predict an individual's abilities, skills, and interests. Both earning and education are crucial for women's empowerment. Upholding women's dignity in the education field is essential. Our research study aims to identify the current situation of women professionals in engineering colleges in Gujarat, India. The survey evaluates qualifications, ratio, and number of women working in various institutes. This comprehensive survey will help policymakers ensure gender equality in the higher education sector.

Keywords: Women faculties, Indian Universities, Engineering Colleges, Ratio of women faculties.

8

Automatic Weed Prediction Using Machine Learning

Pooja Jitendrakumar Raval[1], Dr. Monika Patel[2], Dr. Priti Sajja[3]
[1] Reserch Student, Natubhai V. Patel College of Pure and Applied Sciences
[2] Guide, Natubhai V. Patel College of Pure and Applied Sciences
[3] Professor and Head of the Post Graduate Department of Computer Science, Sardar Patel University, India.

Abstract

Weeds are unwanted plants that compete with crops for essential resources, causing significant reductions in agricultural productivity. In recent years, breakthroughs in Agriculture using Artificial intelligence and machine learning techniques have the potential to transform and modernize how crops are grown, cared and even predict yield. This research proposes an innovative Image processing-based approach for automatic weed detection in agricultural fields. In this system, I will apply new methods to solve problems that farmers have been facing for hundreds of years. With the advancement in machine learning techniques and the availability of machine learning techniques, this work focuses on leveraging convolutional neural networks (CNNs) to make predictions in the native language on the identification of weeds and predict the yield of Crops. The performance of the proposed weed detection system is evaluated through rigorous testing on multiple real-world datasets, showcasing its ability to accurately distinguish between weed species and crops. This weed detection system offers numerous benefits for precision agriculture. By automatically identifying and mapping weed infestations, farmers can target herbicide applications more precisely, reducing chemical usage and potential environmental impacts. This paper details the promise of crop plant signaling for accurate and automated plant recognition in cropping systems. There is no doubt that this report is of great importance for scientists in related research fields to investigate the solutions for weed control in real time.

Keywords: Automatic Weed Detection, Image Processing, Machine learning, Artificial Intelligence.

9

Intelligent Health Awareness System for Rural Women: A Case of Gujarat

Dr. Monika Patel[1], Dr. Priti Srinivas Sajja[2]

[1] Assistant Professor, Computer Science Department, Natubhai V. Patel College of Pure and Applied Sciences, The CVM University, Vallabh Vidyanagar

[2] Professor and Director, PG Department of Computer Science, Sardar Patel University, Vallabh Vidyanagar

Abstract

Women are the essential pillar of the family and society as they can shape the future of the entire society. Developing country like India consists of a significant amount of rural area. Because of a lack of education, socio-economic status, and other factors awareness about one's health is overlooked, generally in the case of rural women. This study demonstrates the development of an intelligent healthcare system, especially for rural women. In the era of technology, it is possible to reach millions of women nationwide and educate them about their health issues. The major objectives of this study are to identify basic women's health issues like menstruation, pregnancy issues, sanitation, malnutrition, etc., and to provide awareness regarding these health issues in rural areas using intelligent technology such as fuzzy logic. Further, this study focuses on finding out various government schemes and experts' advice for tackling health issues in rural areas. This paper presents objectives, a literature review, a generic architecture of the system, fuzzy rules, and other details related to the system.

Keyword: Artificial Intelligence; Fuzzy Logic; Rural Women; Health Awarness.

10

Impact of Household Tasks on Musculoskeletal Health: Prevalence and Associations among Housewives

Dr. Komal Patel[1]

[1] Assistant Professor, P.G. Department of Home Science, Sardar Patel University, Vallabh Vidyanagar

Abstract

Household tasks, especially for housewives managing domestic chores, are integral to daily life. This study examines how these tasks affect housewives' musculoskeletal health, emphasizing the prevalence of musculoskeletal disorders (MSDs) and their connections to different responsibilities. Household tasks, especially for housewives managing domestic chores, are integral to daily life. This study examines how these tasks affect housewives' musculoskeletal health, emphasizing the prevalence of musculoskeletal disorders (MSDs) and their connections to different responsibilities. Methods: A cross-sectional survey was conducted among a representative sample of housewives from diverse socio-economic backgrounds. Participants were queried about their engagement in a range of household tasks, including cleaning, cooking, childcare, and errands. Additionally, they were asked to self-report any musculoskeletal discomfort, pain, or disorders they experienced, particularly in the lower back region. Results: The study uncovered a significant prevalence of musculoskeletal disorders among housewives. Household activities like cooking, chopping, dish washing, cloth washing, and cleaning were notably linked to lower back issues ($p<.0001$). Over a year, respondents reported lower back and knee problems (46.9%), followed by neck (31.3%), upper back (25.4%), shoulders and ankles/feet (14.1%), hips/thighs (13.6%), wrist/hand (12.9%), and elbow (10%) discomfort. Lower back pain was associated with heavy lifting, repetitive tasks, and poor postures ($p<0.05$). Further, pain in the wrist/hand and knee ($P<0.05$) was linked with awkward position and spending more than 8 hours a day doing homework. In addition, there was a relationship between repetitive work and wrist/hand pain ($p<0.05$). In addition, age was identified as a potential risk factor for work-related musculoskeletal disorders ($p=0.016$). Conclusion: This study highlights the impact of household tasks on housewives' musculoskeletal health. Many engage in extended chores with poor posture, leading to issues. Common tasks like cooking, cleaning, and lifting contribute. Preventive measures should focus on ergonomics and proper body mechanics for such activities.

Keywords: musculoskeletal disorders, household tasks, housewives, prevalence, associations, ergonomic practices.

11

Development of Colour Chart Analysis in Mobile Camera System for pH Detection using Litmus Paper pH detection using mobile camera

Kainaz Dhanjisha Daruwala[1], Kamesh Viswanathan Baskaran[2]

[1] Dr. K.C. Patel Research and Development Centre, CHARUSAT, Changa, Gujarat, India

[2] P.D. Patel Institute of Applied Sciences, CHARUSAT, Changa, Gujarat, India

Abstract

The present study was conducted in developing the colour chart analysis of pH sensing using mobile camera with standard reference chart provided by manufacture. The pH 7 was set to zero by calibrating using CIE tool of delta E colour difference analysis. Thereby found linear calibration plot of acidic range from pH 7 to 1 having 95.14% confidence and basic range from pH 7 to 14 having 93.18% confidence. The unknown samples from 1 to 14 with 0.5 increment was measured in mobile camera and validated with the conventional pH meter. The study observed that the validation was able to give accuracy of 93% confidence in estimating the unknown pH values in the solution. It was found that the pH detection was semi-quantitative nature. Still other regression models need to be tested in machine learning process for fine tuning and optimization of higher accuracy in pH detection using colour chart.

Keywords: mobile camera; colour chart; pH sensor; CIE.

12

Optimizing Neuroprotective Nanostructured Lipid Carriers for Transdermal Delivery through Artificial Neural Network

Saloni Dalwadi[1], Vaishali Thakkar[2]

[1] Research Scholar, Gujarat Technological University, Ahmedabad, Gujarat, 382424, India

[2] Department of Pharmaceutics, Anand Pharmacy College, Anand, 388001, India

Abstract

This study aims to explore data mining tools in optimizing Donepezil HCl and Memantine HCl combination-laden nanostructured lipid carriers (NLC) for transdermal drug delivery. The NLC was prepared by high-speed homogenization followed by ultrasonication method. NLC was optimized by powerful data mining tool Design Expert Software by applying Box Behnken Design and through IBM SPSS statistics by applying neural network. The ratio of solid to liquid lipid, % of surfactant, and RPM of high-speed homogenizer were independent variables. The prepared NLC was evaluated for mean particle size and % entrapment efficiency. The separation study was performed through a dialysis membrane, indicating the sustained effect of the formulation. Thus, these results disclosed that NLC could be used as a potential carrier for delivering Donepezil HCl and Memantine HCl into deeper layers of the skin to reach systemic circulation and can serve as a promising formulation for treating Dementia.

Keywords: Artificial neural network; Design of experiment; Donepezil HCl; Memantine HCl; Nano structured lipid carrier.

13

Systematic Review of Cyber Victimization in Emerging Young Adults

Megha Rathore[1], Bigi Thomas[2]

[1] Ph.D. Scholar, Department of Social Work, S.P. University, VVN, Gujarat, India

[2] Department of Social Work, S.P. University, VVN, Gujarat, India

Abstract

This review paper studies the incidence and prevalence of cyber victimization in Emerging Young Adults (18-29 years). Objectives: To investigate the types and effects of cyber victimization among emerging young adults, including studying mediating/moderating factors and gender differences. Method: 25 empirical studies were selected from three databases based on inclusion/exclusion criteria. Results: The age group between 18-25 is most vulnerable to cyberbullying. Prevalence is higher and associated with factors like personality traits, beliefs about anonymity, online content, social support, social media use, and emotional responses. Females are more subjected to cyber victimization than males. The impact is emotional and psychological distress, anxiety, cyber aggression, and depression. Conclusion: Suggestions include variety in sampling, cross-country collaborations, studies on emerging forms of cyber-attacks, empowering women to fight cyber victimization, and solution-driven participatory research.

Keywords: Emerging Young Adults; Cyber Victimization; social media; Impacts; Gender.

14

Deep Learning approaches for crossing Indian roads

Kirtan J Prajapati[1], Kinjal V Joshi[2]

[1,2] G H Patel College of Engineering and Technology, Gujarat

Abstract

In this study, we tackle the pressing concern of road crossing safety for visually impaired individuals, particularly in the tumultuous traffic environments of Indian towns. Current assistance methods, often reliant on expensive and unwieldy sensor-based devices, lack optimal efficacy. To address this, we present an innovative approach using image-based safety classifiers leveraging the distinct pedestrian perspective offered by the INDRA dataset—a comprehensive collection of videos depicting the intricacies of Indian road scenarios. Our methodology involves the development of three hybrid models integrating Convolutional Neural Networks (CNNs) and Long Short-Term Memory (LSTM) networks.To enhance the clarity of our proposed parameters, we emphasize the nuanced integration of MobileNetv3 architecture within the LSTM framework. Specifically, MobileNetv3, known for its efficiency in real-time applications, contributes to the model's ability to discern intricate details within the video frames, improving the overall prediction accuracy. In our comprehensive comparative analysis on the INDRA dataset, we meticulously evaluate the performance of these models. Notably, the MobileNetv3-LSTM model stands out by achieving a precision of 0.865 and a recall of 0.881 on previously unseen images. This exceptional performance underscores the effectiveness of incorporating MobileNetv3, highlighting its role in enhancing the model's precision and recall metrics.

Keywords: Road-crossing safety, Long-Short term memory (LSTM), Transfer learning**ords:** Artificial neural network; Design of experiment; Donepezil HCl; Memantine HCl; Nano structured lipid carrier.

15

A Review on Acne Vulgaris using Convolution Neural Network

Sakshi Agarwal[1], Prof. Tanvi Goswami[2]
[1,2] Dharmsinh Desai University

Abstract

The most prevalent skin-related condition in the entire world is acne vulgaris. It can be identified when there is excessive sebum production, the appearance of inflammatory and non-inflammatory skin lesions, and when there are scars. They are treated by dermatologists who based on their expertise classify and grade their severity manually. As such procedures leave room for error, we use various image processing techniques and machine learning algorithms to correctly categorize their severity and identify their types. In the last few years, there have been various studies on achieving these image classification techniques. This paper aims to review those researches, especially those that apply CNN. There is as of yet not a preferred segmentation method and it is challenging to compare approaches because there is no standardization in the assessment of results for each study. Future scope lies in expanding the current dataset and achieving equal accuracy for each type of acne lesion when they are classified.

Keyword: Acne vulgaris, Image segmentation, Deep Learning, CNN.

16

Automated Brain Tumor Detection in MRI Images using Deep Learning Approach

Dipti Mathpal[1], Dr. Nikhil Gondaliya[2]
[1] Department of Computer Engineering, Madhuben and Bhanubhai Patel Institute of Technology, CVM University Vallabh Vidyanagar, Gujarat, India
[2] Department of Information Technology, G H Patel College of Engineering and Technology, CVM University Vallabh Vidyanagar, Gujarat, India

Abstract

Brain tumor segmentation plays a crucial role in the diagnosis, treatment planning, and monitoring of brain tumors. With the advent of deep learning techniques, automated segmentation methods have witnessed significant advancements, providing accurate and efficient solutions for analysing MRI images. This survey paper aims to provide a comprehensive overview of recent advancements in deep learning-based automated brain tumor segmentation in MRI images. We discuss the key challenges in brain tumor segmentation, review the state-of-the-art deep learning models and architectures, highlight the available datasets, and present an analysis of evaluation metrics and performance comparisons. The survey concludes with an outlook on future research directions in this rapidly evolving field.

Keywords: Brain Tumor, Artificial Intelligence, Machine Learning, Deep Learning, CNN, Segmentation

17

Effect of Intervention Program on the Knowledge, Attitude and Practice of Mothers Regarding Complementary Feeding in Anand

Neha Joshi[1], Tejashri Trivedi[2]

[1,2] Post Graduate Department of Home Science, Sardar Patel University, Vallabh Vidyanagar, India.

Abstract

Complementary feeding is one of the important core indicators of infant and young child feeding practices which needs to be initiated at right age. The research aims to check the level of knowledge, attitude and practices about complementary feeding among mothers and effect of intervention programme on the knowledge, attitude and practice of mothers regarding complementary feeding in Anand. For this study, 150 mothers were enrolled and the information related to knowledge, attitude and practices regarding complementary feeding were collected through pretested questionnaire the intervention program was imparted for one month by educational tool. After intervention period the change in knowledge, attitude and practices of the mothers were assessed. The result revelled that the knowledge and attitude of mothers were changed 85.7% and 92.5% after intervention program, respectively. The practice regarding hygienic condition was changed 55.1%, significantly higher ($p<0.05$) after the intervention period. So, there is significant effect was noted on knowledge, attitude and practices of mothers. In conclusion, the intervention program developed in the present study was found to be useful to improve the knowledge, attitude and practices among mothers regarding complementary feeding.

Keywords: complementary feeding, knowledge, attitude, practice, infant and young child feeding, nutrition education.

18

Investigation of Photoelectrochemical properties of GeSePbx (x= 0, 0.1, 0.2, 0.3, 0.4) single crystals

Ruchita R Patel [1], Sandip V. Bhatt[2], Sandip Unadkat[3]

[1] Navjivan Science College Shri Govind Guru University Vinzol, India

[2] P. G. Department of Applied and Interdisciplinary Sciences (CISST) Sardar Patel University Vallabh Vidyanagar, India

[3] Birla Vishvakarma Mahavidyalay Engineering College, An Autonomous Institute Vallabh Vidyanagar, India

Abstract

This study explores how the inclusion of Pb affects GeSe crystals in Photoelectrochemical performance. GeSePbx (x = 0, 0.1, 0.2, 0.3, 0.4) crystals were examined as semiconductor electrodes under various light intensities (10-120 mW/cm²). Key parameters like short circuit current, open circuit voltage, efficiency, and fill factor were analyzed. Short circuit current and open circuit voltage increased with higher light intensity due to enhanced charge transfer and redox processes. Comparing pure GeSe to GeSePbx (x = 0.1, 0.2, 0.3, 0.4), as Pb concentration increased, photoconversion efficiency (η%) in PEC solar cells improved significantly.

Keywords: Photoelectrochemical; GeSePb; single crystals; solar cell; semiconductor electrode

19

Rising to the Sky: A Historical and Psychological Exploration of Skyscrapers

M. M. Chokhawala[1], Dr. J. R. Pitroda[2], Prof. (Dr.) Indrajit N. Patel[3], Dr. Reshma L. Patel[4]

[1] First Year, M.Tech. (Civil) Construction Engineering and Management, BVM Engineering College, Vallabh Vidyanagar – Gujarat – India.

[2] Associate Professor, PG Coordinator Construction Engineering and Management, Civil Engineering Department, BVM Engineering College, Vallabh Vidyanagar– Gujarat – India.

[3] Professor & Principal, Structural Engineering Department, BVM Engineering College, Vallabh Vidyanagar – Gujarat – India.

[4] Assistant Professor, PG Coordinator Environmental Engineering, Civil Engineering Department, BVM Engineering College, Vallabh Vidyanagar – Gujarat – India.

Abstract

Throughout the course of history, human beings have undergone a process of evolution in their residential and occupational environments, transitioning from humble huts to imposing architectural edifices. This article provides an overview of the historical development and advancement of skyscrapers, as well as the challenges experienced throughout their construction. The proliferation of skyscraper development in metropolitan settings has been driven by the need to optimize land use and accommodate growing population densities. Skyscrapers use the principles of non-linear geometry in the design and construction of their structural frames. Skyscrapers have long served as prominent landmarks in several urban areas, commanding visibility from considerable distances. The objective of this study is to investigate the psychological factors that impact individuals during fire incidents in high-rise buildings. The purpose of this study is to critically examine the existing techniques and tactics used in the building of skyscrapers, as well as the obstacles faced throughout this process. The analysis finally reveals that an individual's contributions to the urban agenda often align with either robust support or vehement rejection. Architects possess considerable power in determining both societal and environmental results.

Keywords: Skyscrapers, High-Rise, Construction, Wind.

20

Multiple Authentication-Based Smart Voting System

Deepak Vala[1], Narendra Ratanpara[2], Devang Rathod[3], Jagdish M Rathod[4], A B Bambhaniya[5], Mehfuza Holia[6]

[1,2,3,4,5,6] Birla Vishvakarma Mahavidyalaya Engineering College, Vallabh Vidyanagar, 388120

Abstract

The electoral process is important in democracies like India. To "vote" is to decide who of the candidates you think the best is. Voting refers to the procedure whereby a group of people chooses a leader from a list of candidates by expressing their preferences. In this paper, we suggest a mechanism that will allow voters who are Indian nationals and are at least 18 years old to cast ballots without traveling to their home constituency on Election Day. Our multiple authentication-based smart voting system's goal is to enable people to vote electronically in local elections from their current location. The voting process in this system is based on RFID, the Aadhar biometric database, which contains fingerprints, and OTPs (one-time passwords).

Keywords: Multiple Authentication, Smart Voting, RFID, biometric database, fingerprint, OTPs

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Nanostructured Materials in Construction: A Path to High-Performance Infrastructure

Ms. Purna Vachhani[1], Dr. J. R. Pitroda[2], Prof. (Dr.) Indrajit N. Patel[3], Dr. Reshma L. Patel[4]

[1] First Year, M.Tech. (Civil) Construction Engineering and Management, BVM Engineering College, Vallabh Vidyanagar – Gujarat – India.

[2] Associate Professor, PG Coordinator Construction Engineering and Management, Civil Engineering Department, BVM Engineering College, Vallabh Vidyanagar– Gujarat – India.

[3] Professor & Principal, Structural Engineering Department, BVM Engineering College, Vallabh Vidyanagar – Gujarat – India.

[4] Assistant Professor, PG Coordinator Environmental Engineering, Civil Engineering Department, BVM Engineering College, Vallabh Vidyanagar – Gujarat – India.

Abstract

Nanotechnology is revolutionizing the construction industry by offering innovative solutions to traditional challenges. Nanomaterials, such as nanoparticles, nanofibers, and nanotubes, are being integrated into concrete, coatings, and composites to enhance their mechanical properties and resistance to environmental factors. These nanocoatings can regulate heat and light, reducing power consumption for heating, cooling, and lighting. Self-healing nanomaterials can extend infrastructure lifespan by repairing cracks and structural damage, reducing maintenance costs and environmental impact. Nanotechnology also offers innovative design possibilities, allowing architects and engineers to create self-cleaning facades, adaptive materials, and responsive surfaces that adapt to environmental changes. This opens new avenues for sustainable and aesthetically pleasing construction practices. Environmental sustainability is a key concern in the construction industry, and nano-engineered materials can reduce the carbon footprint by utilizing recycled materials and enhancing energy efficiency. Nanocatalysts can purify air and water, contributing to healthier urban environments. In conclusion, nanotechnology is transforming the construction industry by enhancing performance, sustainability, and design aesthetics. However, challenges related to safety, regulation, and cost-effectiveness must be addressed to ensure responsible integration.

Keywords: Nanotechnology, Construction, Nanomaterial.

22

Raspberry Pi-Based Weather Reporting Over IOT

Deepak Vala[1], Atman Shah[2], Devang Rathod[3], Jagdish Rathod[4], Mehfuza Holia[5], Arjun Bhambhaniya[6]

[1,2,3,4,5] Electronics Engineering Department, BVM Engineering College, Vallabh Vidhyanagar, 388120

[6] EC Engineering Department, BVM Engineering College, Vallabh Vidhyanagar, 388120

Abstract

The cost-efficient, adaptable, and customizable Raspberry Pi-based IoT weather reporting system provides a solution for tracking and reporting weather conditions. To gather current weather information, the system makes use of sensors air pressure, air quality, temperature, humidity, rain, and raindrops. This data is then processed by the Raspberry Pi and sent to a cloud server for storage and analysis. The system offers remote monitoring capabilities, allowing users to access weather data from anywhere. It is designed to be low power consuming, making it an energy-efficient solution.

Keywords: Internet of Things (IoT), Raspberry Pi, Temperature, humidity, rainfall, Weather Analysis, Cloud-based Data

23

Micro-Pile: New Era for Construction Industry

Divyesh Sanjaybhai Solanki[1], Dr. J. R. Pitroda[2], Prof. (Dr.) Indrajit N. Patel[3], Dr. Reshma L. Patel[4]

[1] First Year, M.Tech. (Civil) Construction Engineering and Management, BVM Engineering College, Vallabh Vidyanagar – Gujarat – India.

[2] Associate Professor, PG Coordinator Construction Engineering and Management, Civil Engineering Department, BVM Engineering College, Vallabh Vidyanagar– Gujarat – India.

[3] Professor & Principal, Structural Engineering Department, BVM Engineering College, Vallabh Vidyanagar – Gujarat – India.

[4] Assistant Professor, PG Coordinator Environmental Engineering, Civil Engineering Department, BVM Engineering College, Vallabh Vidyanagar – Gujarat – India.

Abstract

The present article delves into the subject of ground improvement, which is regarded as a creative facet within the field of geotechnical engineering. Engineers use deliberate manipulation of soil conditions rather than depending only on its natural state to fulfil project specifications. This method has the potential to provide cost savings and expedite adoption. In recent years, there have been notable advancements in ground improvement techniques, resulting in a diverse range of approaches available for enhancing soil qualities. The selection of an appropriate methodology is of utmost importance to achieve optimal progress while minimising exertion. The method of micro-piling is extensively examined and emphasised within this discourse. Micro piles are often used to enhance the load-bearing capacity, mitigate settlement issues, and reinforce pre-existing foundations. The efficacy of piles is thought to be attributed to the frictional resistance between the pile and the earth, as well as the presence of group/network effects. Micro piles are a kind of friction pile that is characterised by its tiny diameter and construction method including drilling and grouting. These piles consist of steel pieces that are securely attached to the surrounding soil or rock using cement grout. In the process of drilling, it is necessary to record the bearing stratum to verify and confirm that the bearing capacity is sufficient. Micro piles do not depend on the capacity of the end-bearing, thereby obviating the need to assess the competence of the rock beyond the depth of bonding. The use of highly versatile mobile drilling equipment enables the efficient installation of micro piles in a wide range of soil conditions, hence facilitating rapid deployment.

Keywords: Construction, Ground Improvement, Micro-Piles, Techniques.

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Development of Automated Harness Testing System

Deepak Vala[1], Hrishikesh Vegad[2], Devang Rathod[3], Jagdish Rathod[4], Mehfuza Holia[5], Arjun Bhambhania[6]

[1,2,3,4,5] Electronics Engineering Department, BVM Engineering College, Vallabh Vidhyanagar, 388120

[6] EC Engineering Department, BVM Engineering College, Vallabh Vidhyanagar, 388120

Abstract

The design, development, and application of a "Development of Automated Space Harness Testing System Using Raspberry Pi and Zigbee Protocol" with the capability of testing diverse cable harness configurations (with connectors like 9 pins, 15 pins, 25 pins, etc.) are presented. The automated harness tester uses a combination of hardware and software to perform the testing, including specialized connectors. This system uses a conventional method which is a source-destination methodology to detect open- and short-circuits and incorrect pinning in a harness under test. In this way, the harness testing system can test up to 50 different connector types in a module, and even more than that. We have also designed a 102-pin connector with loopback and interconnection features.

Keywords: IoT, Weather Analysis, Cloud-based Data, Real-time, Space, Harness Testing, Protocol

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Raspberry Pi Based Weather Reporting Over IOT

Deepak Vala[1], Trupti Baraiya[2], Jagdish Rathod[3], Devang Rathod[4], Arjun Bambhaniya[5]

[1,2,3,4] Electronics Engineering Department, BVM Engineering College, Vallabh Vidhyanagar, 388120

[5] EC Engineering Department, BVM Engineering College, Vallabh Vidhyanagar, 388120

Abstract

The Internet of Things-centered weather reporting system makes it simple and effective to track climate parameters online. For the purpose of tracking climate surroundings and providing real-time climate data, we integrated temperature, humidity, and rain sensors. This automated system uses a microcontroller to connect wirelessly to the web server and deliver data there. On the server system, the real-time data is updated. As a result, consumers may easily access weather data.

Keywords: IOT, Raspberry Pi model, sensors, MQTT ProtocolIntroduction

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Exploring Crane Systems and Innovative Erection Methods in Building and Infrastructure Projects

Mohit Maheshbhai Mojidra[1], Dr. J. R. Pitroda[2], Prof. (Dr.) Indrajit N. Patel[3], Dr. Reshma L. Patel[4]

[1] First Year, M.Tech. (Civil) Construction Engineering and Management, BVM Engineering College, Vallabh Vidyanagar – Gujarat – India.

[2] Associate Professor, PG Coordinator Construction Engineering and Management, Civil Engineering Department, BVM Engineering College, Vallabh Vidyanagar– Gujarat – India.

[3] Professor & Principal, Structural Engineering Department, BVM Engineering College, Vallabh Vidyanagar – Gujarat – India.

[4] Assistant Professor, PG Coordinator Environmental Engineering, Civil Engineering Department, BVM Engineering College, Vallabh Vidyanagar – Gujarat – India.

Abstract

Before connecting them, the operations involve lifting and arranging the components, machinery, structures, and pipes. This is known as erecting technology. Construction cranes may be classified into two main categories: tower cranes and mobile cranes. Cranes are the most obvious equipment on the construction site because of their size and significant role in transporting materials and pieces both vertically and horizontally. A method for handling materials on-site that is designed for usage during construction is called the Automated Crane Erection Method (ACES). It provides an example of how integrating various construction operations can improve the quality, productivity, and safety of the construction system. Tower crane operators benefit from having a thorough site view and a broad field of vision because to this distinction between tower cranes and mobile cranes, which is more conceptual than merely technical. It was investigated and researched how to construct segmented towers using a mobile crane and relaying ancillary equipment. The use of the superstructure rotation technique (SRM) has been employed in the construction of single-span steel arch bridges in situations when it is not feasible to construct the spans on temporary supports situated along a road or in a river bed.

Keywords: Construction, Crane, Erection, Method, Safety.

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Green synthesis of biodegradable gold nanoparticles using Tradescantia spathacea

Janki N. Thakker[1], Bijal Patel[2], Pinakin Dhandhukia[3]

[1,2] Department of Biotechnology, P.D. Patel Institute of Applied Sciences, Charotar University of Science and Technology, CHARUSAT Campus, Changa-388421, Anand (Gujarat), India

[3] Department of Microbiology, School of Science and Technology, Vanita Vishram Women's University, Athwa Gate, Surat-395001, Gujarat, India

Abstract

In the current work, Tradescantia spathacea leaf extract was used to explore the production of biodegradable gold nanoparticles. For the reduction of Au+ ions, a hydrated auric chloride aqueous solution (HAuCl4) was combined with T. spathacea leaf extract and left at room temperature for two hours. The extract's transformation from brown to black was evidence of the formation of the gold nanoparticles. Gold nanoparticles had a distinctive absorbance peak at 545 nm, and a Dynamic Light Scattering instrument revealed that the average particle size was 20.12 nm. Using Fourier transfer infrared spectroscopy (FTIR), it was discovered that the amide linkages of proteins coupled to gold nanoparticles had Amide bands because of the -N-H stretch and C=O. Particles' rod-like shapes were confirmed employing atomic force microscopy (AFM).

Keywords: Tradescantia spathacea, gold nanoparticles, biodegradable, Biosynthesis.

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Necessary and sufficient Conditions for Weak Singularity in Tolman-Bondi Models

Bina Patel [1]

[1] Department of Mathematical sciences, P D Patel Institute of Applied Sciences, CHARUSAT, CHANGA-388421 India.

Abstract

In the context of the Tolman-Bondi dust collapse model without a cosmological constant, it has been observed that shell crossing singularity consistently takes place when starting from time-symmetric, regularly distributed initial data. This occurrence typically happens in proximity to the central region of the matter configuration. We have determined that a weak shell-crossing singularity arises during end stage of collapse of matter when the external shells of the matter accelerate than the internal shells, provided certain conditions are met. This phenomenon is initiated by specific initial data and consistently occurs close the middling region. When inceptive data are time-symmetric and regular, weak singularity is a common outcome. However, for non-time-symmetric initial information, whether shell crossing occurs or not depends on the primary velocity account. In cases where the initial data is physically sensible, weak singularity occurs near the center of before the depth bounce radius is accomplished. These findings were derived from calculations using Mathematica.

Keywords: Tradescantia spathacea, gold nanoparticles, biodegradable, Biosynthesis

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Exploring Crane Systems and Innovative Erection Methods in Building and Infrastructure Projects

Mohit Maheshbhai Mojidra[1], Dr. J. R. Pitroda[2], Prof. (Dr.) Indrajit N. Patel[3], Dr. Reshma L. Patel[4]

[1] First Year, M.Tech. (Civil) Construction Engineering and Management, BVM Engineering College, Vallabh Vidyanagar – Gujarat – India.

[2] Associate Professor, PG Coordinator Construction Engineering and Management, Civil Engineering Department, BVM Engineering College, Vallabh Vidyanagar– Gujarat – India.

[3] Professor & Principal, Structural Engineering Department, BVM Engineering College, Vallabh Vidyanagar – Gujarat – India.

[4] Assistant Professor, PG Coordinator Environmental Engineering, Civil Engineering Department, BVM Engineering College, Vallabh Vidyanagar – Gujarat – India.

Abstract

Before connecting them, the operations involve lifting and arranging the components, machinery, structures, and pipes. This is known as erecting technology. Construction cranes may be classified into two main categories: tower cranes and mobile cranes. Cranes are the most obvious equipment on the construction site because of their size and significant role in transporting materials and pieces both vertically and horizontally. A method for handling materials on-site that is designed for usage during construction is called the Automated Crane Erection Method (ACES). It provides an example of how integrating various construction operations can improve the quality, productivity, and safety of the construction system. Tower crane operators benefit from having a thorough site view and a broad field of vision because to this distinction between tower cranes and mobile cranes, which is more conceptual than merely technical. It was investigated and researched how to construct segmented towers using a mobile crane and relaying ancillary equipment. The use of the superstructure rotation technique (SRM) has been employed in the construction of single-span steel arch bridges in situations when it is not feasible to construct the spans on temporary supports situated along a road or in a river bed.

Keywords: Construction, Crane, Erection, Method, Safety.

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Attitudes of Intimate Partners Violence

A study among Female Students from Gujarat

Ketal Vadhel[1], Bigi Thomas[2]

[1,2] Department of Social Work, S.P. University, VVN, Gujarat, India

Abstract

Intimate Partner Violence is a term used to describe abuse between current or former intimate partners. This includes physical, sexual, psychological, & economic abuse. IPV can cause long-lasting harm to the victim's health, social, economic well-being. The study aimed to investigate the perspectives of Gujarat female students concerning IPV and the factors linked to it. A cross-sectional survey design was respondents in the study, involving a sample of 228 Female students from five universities in Gujarat. The participants completed a structured questionnaire that measured their demographic characteristics and attitudes towards IPV. The results showed that the majority of the female students do not support intimate partner violence attitudes. The findings indicated that most female students do not Favor attitudes towards IPV. The main barriers to attitudes were Gender roles, Inequality, Childhood victimization. The study suggests that there is a need for more awareness and education programs on IPV among university students in Gujarat.

Keywords: Intimate partner violence, Attitudes, Female students

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Transforming Urban Infrastructure: The Evolution and Advantages of Trenchless Technology in Road Construction

Hardik J. Jethwa[1], Dr. J. R. Pitroda[2], Prof. (Dr.) Indrajit N. Patel[3], Dr. Reshma L. Patel[4]

[1] First Year, M.Tech. (Civil) Construction Engineering and Management, BVM Engineering College, Vallabh Vidyanagar – Gujarat – India.

[2] Associate Professor, PG Coordinator Construction Engineering and Management, Civil Engineering Department, BVM Engineering College, Vallabh Vidyanagar– Gujarat – India.

[3] Professor & Principal, Structural Engineering Department, BVM Engineering College, Vallabh Vidyanagar – Gujarat – India.

[4] Assistant Professor, PG Coordinator Environmental Engineering, Civil Engineering Department, BVM Engineering College, Vallabh Vidyanagar – Gujarat – India.

Abstract

In contemporary times, there is a notable correlation between population growth and advancements in technology. Trenchless technology is considered to be one of the notable advancements in the field. Prior to the advent of trenchless technology, subterranean work could only be conducted using the open-cut approach. This approach is characterized by its time-consuming nature, complexity, extensive resource utilization, and potential hazards to workers. Additionally, it has adverse effects on both the environment and the ground in proximity to the area of operation. Furthermore, it has had an impact on the preexisting road traffic infrastructure. As a consequence of increased traffic, the immediate vicinity will experience heightened levels of pollution, including noise and air pollution. The aforementioned issue may be resolved by the use of trenchless technology, which has shown to be a more efficient, sustainable, secure, and ecologically conscious approach. This technology facilitates the installation, upgrading, replacement, and maintenance of pipes without causing any adverse impact on the surface area. This study provides a brief overview of several trenchless technologies used as alternatives to open-cut technology for replacement purposes. The present research investigates the use of trenchless construction technology inside the urban road construction domain. This paper presents a comprehensive examination of the introductory aspects, distinctive characteristics, extent, and evaluation criteria pertaining to trenchless construction techniques within the framework of urban road infrastructure expansion.

Keywords: Environment, Install, Infrastructure, Open-cut method, Safety, Trenchless technology

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Unsupervised Deep Learning Approach for Video Retrieval using Image Query

Namrata Dave[1], Dr. Mehfuza S. Holia[2]

[1] G H Patel College of Engineering & Technology, Gujarat, India

[2] Birla Vishwakarma Mahavidyala, Gujarat, India

Abstract

A large amount of digital content is generated every hour in the form of text, images, and videos through day-to-day online activities worldwide. To efficiently process this vast volume of video content, cost-effective techniques are necessary for quickly extracting meaningful information. This paper aims to address the problem of content-based video retrieval using unsupervised deep learning, employing a proposed Auto Encoder Model on a collection of videos recorded from Gujarati News Channels. To expedite video processing, key frames are extracted from each video, followed by feature extraction and retrieval using the proposed Deep Denoising Autoencoder Model. The performance of video retrieval is evaluated based on a query set consisting of image queries. Extensive experiments are conducted on the model to assess and enhance the video retrieval performance using image queries, demonstrating superior performance compared to state-of-the-art video retrieval methods on news video datasets.

Keywords: Deep Learning, Auto Encoders, Video Retrieval, Unsupervised Learning.

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Revolutionizing the Concrete Industry: A Comprehensive Review of Robotic Applications

Devang J. Rathod[1], Umang Raichura[2], J. R. Pitroda[3], Jagdish M. Rathod[4], Reshma L. Patel[5]

[1] Department of Electronics Engineering, Birla Vishvakarma Mahavidyalaya Engineering College, V.V.Nagar

[2] Department of Civil Engineering, Birla Vishwakarma Mahavidyalaya Engineering College, V.V.Nagar

[3] Associate Professo, Civil Engineering Department, BVM Engineering College, V.V.Nagar

[4] Professor, Department of Electronics Engineering, Birla Vishwakarma Mahavidyalaya Engineering College, V.V.Nagar

[5] Assistant Professor, Civil Engineering Department, BVM Engineering College, V.V.Nagar

Abstract

The concrete industry has witnessed a significant transformation with the integration of robotic technologies. The concrete industry, a cornerstone of modern construction, has experienced a paradigm shift propelled by the integration of cutting-edge robotic technologies. This review delves into the revolutionary advancements brought about by the application of robotics across different facets of the concrete lifecycle. From the precision-driven construction processes to the maintenance of concrete structures, robotics has ushered in a new era of efficiency, safety, and sustainability. The review begins by examining the integration of robotics in the construction phase, encompassing tasks such as formwork assembly, concrete pouring, and even the erection of intricate structures. Robotic arms and autonomous machinery have redefined the way concrete is placed and shaped, reducing labor-intensive processes and expediting project timelines. Moreover, these technologies have enabled the realization of complex architectural designs that were once deemed challenging to execute. Beyond the construction phase, this review explores how robotics has redefined concrete maintenance and inspection. Drones equipped with advanced sensors and imaging capabilities are employed to assess the structural health of concrete elements, identifying potential issues before they escalate. The incorporation of smart sensors within concrete structures, coupled with robotic devices, allows for real-time monitoring of structural integrity, contributing to enhanced safety and longevity. The review also delves into the realm of concrete recycling, where robotic systems are employed to sort and process waste concrete, transforming it into reusable aggregates. This sustainable approach not only reduces environmental impact but also addresses the growing concern of concrete waste. While the integration of robotics in the concrete industry presents numerous advantages, challenges such as programming complexity, cost considerations, and the need for skilled technicians must be addressed. Nevertheless, the trajectory is clear: robotics is poised to play a pivotal role in revolutionizing the concrete industry, fostering innovation, and shaping the future of construction and infrastructure development.

Keywords: Concrete Industry, Robotics, Construction, Maintenance, Inspection, Sustainability, Technology, Automation, Revolution, Efficiency

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Assessment of Nutritional Status, Knowledge and Consumption Pattern of Millets Among the Women Population of Surat (URBAN)

Prof. Komal Chauhan[1], Sonal Suva[2]

[1,2] Department of Foods and Nutrition, The Maharaja Sayajirao University of Baroda, Vadodara, (Guj) India

Abstract

There are many benefits of eating millet but the awareness about the importance of millet is low among the population. Women have a special role in healthy nutrition. Therefore knowledge about millets is essential. Methodology: 350 women were enrolled from Surat urban city. Semi structured questionnaire was used. Findings: Mean age of was 35±11years, 83.71% women were Hindus, 55.43% of had normal BMI. Consuming vegetarian diet were 66.57%. Around 64% had good knowledge, and 1.14% women had poor knowledge, remaining fair. Consumption of large and small millets was only 37.43% who consume sorghum millet frequently, 14% do not eat millet as not available. Poor taste was the key factor for dislike on consumption. An insignificant but distinct difference between the variables like millet consumption, hemoglobin levels and nutritional status was found.

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Prefabricated Modular Construction in Recent Time

Nijal Alpeshkumar Kadia[1], Dr. J. R. Pitroda[2], Dr. Reshma L. Patel[3], Prof. (Dr.) Indrajit N. Patel[4]

[1] First Year, M.Tech. (Civil) Construction Engineering and Management, BVM Engineering College, Vallabh Vidyanagar – Gujarat – India.

[2] Associate Professor, PG Coordinator Construction Engineering and Management, Civil Engineering Department, BVM Engineering College, Vallabh Vidyanagar– Gujarat – India.

[3] Assistant Professor, PG Coordinator Environmental Engineering, Civil Engineering Department, BVM Engineering College, Vallabh Vidyanagar – Gujarat – India.

[4] Professor & Principal, Structural Engineering Department, BVM Engineering College, Vallabh Vidyanagar – Gujarat – India.

Abstract

Modular building is a modern construction technique that offers advantages such as enhanced speed, production safety, improved quality control, and reduced environmental effects. However, its application is limited due to the lack of robust structural systems and joining procedures. Modular structures are cost-effective, safe, and environmentally sustainable, providing cost-effective, comfortable, and environmentally friendly dwelling options. However, they have disadvantages such as complicated module transportation, demanding production coordination, detailed planning, and public non-acceptance. Construction waste is a significant environmental concern, resulting in the production of many metric tonnes annually. This study investigates the efficacy of prefabrication techniques in waste reduction, focusing on key aspects contributing to its success. The findings show that prefabrication techniques can significantly mitigate issues related to substandard craftsmanship and significantly decrease waste creation. The application of plastering has shown a 100% reduction in waste output. The research aims to examine the performance of modular prefabricated structures in relation to factors such as acoustic limitations, seismic resilience, thermal characteristics, energy use, and life cycle analysis. Prefabrication can be classified into various categories, including components, panels, modules, hybrids, and unitized full buildings.

Keywords: Construction, Modular construction, Off-site Prefabrication.

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Deep Learning Techniques for Scene Classification and Labelling Images

Polavarapu.V.N Rishitha Chowdary[1], M.Geethika[2], G.Geetha[3]

1,2,3 Department of Information Technology Velagapudi Ramakrishna Siddhartha Engineering College Vijayawada, India

Abstract

In the image processing domain applications, which includes image retrieval, autonomous navigation, and content recommendation, scene categorization is crucial. Deep learning procedures have demonstrated the tremendous skill in overcoming the obstacles associated with visual scene categorization. This work gives a thorough investigation of deep learning-based visual scene categorization. Convolutional neural networks (CNNs) are used in the suggested method to extract features and recognize hierarchical patterns. To leverage the discriminative characteristics found in diverse scene categories, we investigate a range of architectures, including cutting-edge pre-trained models. The usefulness of data augmentation approaches like Geometric Transformations, Color and Intensity Transformations to improve the model's generalization capacity is also examined in this work, particularly in situations when the availability of labelled training data is constrained.

Keywords: CNN, Resnet, Densenet, Data Augmentation, Neural Networks, Algorithms, Pooling, Fully Connected Layers

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Automation and Robotics: A future/trend of Construction Industry

M. M. Chokhawala[1], Dr. J. R. Pitroda[2], Prof. (Dr.) Indrajit N. Patel[3], Dr. Reshma L. Patel[4]

[1] First Year, M.Tech. (Civil) Construction Engineering and Management, BVM Engineering College, Vallabh Vidyanagar – Gujarat – India.

[2] Associate Professor, PG Coordinator Construction Engineering and Management, Civil Engineering Department, BVM Engineering College, Vallabh Vidyanagar– Gujarat – India.

[3] Professor & Principal, Structural Engineering Department, BVM Engineering College, Vallabh Vidyanagar – Gujarat – India.

[4] Assistant Professor, PG Coordinator Environmental Engineering, Civil Engineering Department, BVM Engineering College, Vallabh Vidyanagar – Gujarat – India.

Abstract

The building and construction sector holds a central position in the global industry landscape. However, it grapples with persistent concerns related to diminishing quality standards and productivity in its final outcomes. This predicament is largely attributed to the industry's labour-intensive nature and its operation in environments fraught with potential hazards. In response to these challenges, the importance of construction robotics has experienced a rapid and substantial rise. This paper seeks to delve into the various factors influencing the adoption of automation and robotics within the construction domain and shed light on their effective application. The integration of construction automation and robotics stands as a promising solution that not only addresses the industry's existing shortcomings but also paves the way for remarkable improvements. One of the paramount advantages of incorporating automation and robotics into construction processes is the significant enhancement of product excellence. These advanced technologies bring precision and consistency to tasks that were previously prone to human error. As a result, the overall quality of construction projects sees a remarkable uplift, meeting and even surpassing industry standards. Furthermore, the introduction of automation and robotics plays a pivotal role in safeguarding the well-being of workers within the construction industry. By taking over hazardous and physically taxing tasks, these technologies reduce the risk of on-site accidents and occupational health issues. This, in turn, leads to improved working conditions, ensuring worker security and welfare. In addition to elevating product quality and worker safety, automation and robotics in construction also contribute substantially to ensuring overall project safety. The automation of risky tasks minimizes the chances of accidents, making construction sites safer environments for all stakeholders involved. In conclusion, the integration of automation and robotics in the construction sector represents a transformative step forward. It not only addresses the industry's prevailing challenges but also opens doors to a future where construction projects are characterized by higher quality, enhanced worker well-being, and greater safety for all.

Keywords: Automation, Construction, Robots, Safety, Cost

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Crops recommendation based on soil and weather prediction

Mahek Gohil[1], Dr.Namrata Dave[2]

[1,2] Assistant Professor, Departement of Computer Engineering, G H Patel College of Engineering & Technology. VVN, Anand, Gujarat, India

Abstract

Soil is important to humans and all life on earth as it serves as a source of agriculture, food and medicines. There are different types of soil, each with different mineral, humus and organic matter compositions and different properties that can be used to grow different crops. Proposed work implements a system for farmers to recommend crops based on weather forecasts and suitable soils. This proposed system will help farmers accurately identify crops without worrying about future weather or suitable soil. Through this system, farmers can get more profit. The system will help farmers by prediction of yields depending on soil parameters such as pH, nitrogen, phosphorus, potassium, temperature, humidity and precipitation soil type & various machine learning algorithms such as Convolutional Neural Network (CNN), Random Forest Model, Gradient Boosting, decision tree, GB will be used in the proposed research work.

Keywords: Machine learning, crop prediction, soil, rainfall

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Predictive Analysis of various Statistical Models used in Cloud Environment

Akrati Sharma[1], Priti Maheshwary[2]
[1] Research Scholar, RNTU, Bhopal
[2] Proffesor, RNTU, Bhopal

Abstract

In the current era of the Digital Industrial Revolution, also known as Industry 4.0 or 4IR, the digital world has access to a vast amount of data, including data from mobile devices, social media platforms, businesses, the Internet of Things (IoT), cyber-security systems, health records, etc. To design and build appropriate cloud-based smart and automated applications and conduct an intelligent predictive analysis of these data to determine the possibilities of future outcomes based on historical data, data patterns, and the useful insights from data to make educated predictions about future events or trends. The key to anticipating such an analysis is having knowledge of machine learning (ML), artificial intelligence (AI), and statistical models. Predictive analysis is carried out using a number of statistical models in cloud computing circumstances. Some of these can be best fitted using state space models, SARIMA (seasonal ARIMA), exponential smoothing models, ARIMA models, and so on. In order to promote data-driven decision-making in the dynamic and changing landscape of cloud technologies throughout this digital industrial revolution, the study examines the advantages, disadvantages, and application of these models. The research provides insight into the effectiveness and applicability of various statistical methodologies, enabling decision-makers to make well-informed decisions for improving workload management, resource allocation, and operational efficiency in cloud environments.

Keywords: ARIMA, SARIMA, Statistical Models, Predictive Analysis

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Calibration of sensor and Data Acquisition for homely gases using Arduino

Ankita J. Mahaliya[1], Divyang Ka. Patel[2], H. N. Kapse[3]
Department of Instrumentation & Control, Institute of Science & Technology for Advanced Studies & Research (ISTAR) – CVM University, Vallabh Vidyanagar, 388120, Gujarat.

Abstract

A metal oxide semiconductor (MOS) gas sensor have the capability to detect volatile and dangerous gases in the environment. This type of sensors have been extensively utilized in environment monitoring, healthcare, food industry and other areas. One such MQ-2 gas sensor is highly sensitive to LPG, propane, smoke, and methane gases but need the calibration. There are different ways to calibrate the gas sensor, but they are quite expensive and time-consuming. To find the optimized way 2-point and 4-point calibration methods were used to observe the sensor response using the Arduino Uno module and found to be quite satisfactory. Data acquisition system implemented here was used for monitoring gas response to study homely gases and hence preventive actions could be taken in the case of excess. With PLX-DAQ software, the system was able to collect and store data in spreadsheet.

Keywords: Arduino UNO, Data Acquisition, MQ-2 gas sensor, PLX-DAQ softwareta Augmentation, Neural Networks, Algorithms, Pooling, Fully Connected Layers

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Performance Analysis of Linear Predictive Coder (L.P.)

Rajnikant Rathod[1], Dr. Mehfuza Holia[2]
[1]Assistant Professor, L.E. College of Engineering, Morbi
[2]Assistant Professor, Birla Vishvakarma Mahavidhyalaya Engineering College

Abstract

Voice-coding has been found importance in the vicinity of next generation modern wireless communication and digital audio as well as voice processing. Voice-coding is the art of renovating the voice signal in a more dense form, which can be broadcasted with a small numbers of binary digits. Linear Predictive Coding is an extensively utilized technique in audio as well as Voice signal processing. It has create particular use in voice-signal Compression, allowing for very high density rate. This Paper talk about about two speech segments sampled at 22KHz and Windowed, Log, L.P. Spectrum with L.P. residual for different L.P. order for Rectangular, Hamming,Hann window and found both source and system information through envelope of the spectrum and spectral ripples. The common observation that can be made from observing the spectrum of the Linear predictive coding is that Cor-relation being gradually removed in the 'L.P. residual' signal as the 'L.P. order' is raised, and 'L.P. residual' signal for an 'L.P. order' of 10 or above removes most of the correlations in the input signal, and the resulting signal looks like a train of impulses. The 'L.P. log spectrum' approximates the short-time spectral envelope i.e. formants better with increased Linear Prediction order.

Keywords: Linear Predictive Coding, Log Spectrum, L.P.C. co-efficient, L.P.C. Synthesis

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Systematic Review of Diagnosis and Classification Techniques of Acute Lymphoblastic Leukaemia and Acute Myeloid Leukaemia Cells

Rimi N. Agrawal[1], Dr.Viral Kapadia[2]
[1] Asst. Professor, SVIT, (CE), Vasad, (Gujarat), India
[2] Associate Professor, M.S.University, (CSE), Vadodara, (Gujarat), India

Abstract

White blood cells, or leukocytes, can unexpectedly spread throughout the bone marrow and blood, resulting in blood cancer or leukaemia. It affects kids and teens more frequently than any other illness. By looking at the patient's blood smear under a microscope, haematologists can identify leukaemia. It can identify and categorise leukaemia by counting blood cells and looking at biological characteristics. However, the manual method used to diagnose leukaemia is exceedingly time- and labour-intensive. Machine learning, deep learning, and expert systems are many computer-aided practical approaches in computer science that can improve the accuracy and speed of detection and classification of leukaemia blood cells in comparison to the outcome produced by human analysis (manual technique). This paper provides thorough review of the diagnosis and Classification of the acute leukaemia, including image segmentation, feature extraction, feature selection, and classification approaches, are thoroughly analysed in this study. Based on the type of classification step, all diagnosis and classification methods can be divided into four groups: traditional methods (ML), Deep Neural Networks (DL) methods, Expert system methods, and mixture approaches (ML + DL). Based on the review some of the future scope of work is also outlined.

Keywords: Acute Leukaemia, Machine Learning, Deep learning, Expert System

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Sustainable Building Materials: Lightweight Aggregates from Industrial Waste

Malav Nileshbhai Shah[1], Dr. J. R. Pitroda[2], Dr. Reshma L. Patel[3], Prof. (Dr.) Indrajit N. Patel[4]

[1] First Year, M.Tech. (Civil) Construction Engineering and Management, BVM Engineering College, Vallabh Vidyanagar – Gujarat – India.

[2] Associate Professor, PG Coordinator Construction Engineering and Management, Civil Engineering Department, BVM Engineering College, Vallabh Vidyanagar– Gujarat – India.

[3] Assistant Professor, PG Coordinator Environmental Engineering, Civil Engineering Department, BVM Engineering College, Vallabh Vidyanagar – Gujarat – India.

[4] Professor & Principal, Structural Engineering Department, BVM Engineering College, Vallabh Vidyanagar – Gujarat – India.

Abstract

The significant increase in the use of concrete in buildings, particularly with the usage of normal-weight aggregates (NWAs) like gravel and granite, has led to a substantial depletion of natural stone reserves, resulting in irreversible environmental harm. Consequently, there has been a heightened focus on sustainable materials in recent times. The increasing need for sustainable development has prompted researchers to concentrate their inquiry on the use of waste or recycled resources as prospective building components. The use of lightweight aggregates (LWAs) derived from industrial waste materials, including fly ash, coconut shells, expanded slag cinder, and bed ash, has resulted in the development of sustainable materials. Nevertheless, the absence of advanced industrial processes in emerging and impoverished nations has not yielded significant benefits for them. Significant financial savings may be achieved by reducing the weight of the building. Long-acting reversible contraceptives (LARCs), such as long-acting reversible intrauterine devices (IUDs) and contraceptive implants, have been extensively used in industrialised nations for a considerable duration, demonstrating their efficacy in terms of cost-effectiveness. The entity above fulfilled the dual objectives of ensuring structural integrity and promoting economic sustainability. Structures tend to exhibit more versatility as their weight decreases.

Keywords: Concrete, Construction, Lightweight aggregates (LWAs), Normal-weight aggregates (NWAs)

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Distributed Control in DC Microgrids to Improve Voltage Regulation and Current Sharing Accuracy

S. L. Kaila[1], Dr. R. H. Bhesdadiya[2], Dr. H. M. Karkar[3]

[1] Research scholar, Gujarat Technological University, Ahmedabad, India

[2] Assistant professor, Lukhdhirji Engineering Collge, Morbi, Gujarat, India

[3] Assistant professor, Government Engineering College, Rajkot, Gujart, India

Abstract

At this time, the microgrid is the best solution of the conventional grid to reduce the use of fossil fuel and pollution. A DC microgrid is very popular compared to an AC microgrid because of high efficiency, high reliability and easy control. The main goals of DC microgrid control are equal load sharing among all sources and low voltage regulation. In a DC microgrid, generally droop control is used for equal load sharing among sources. There are two drawbacks of traditional droop control. (1) Reduce current sharing accuracy due to different line resistance. (2) Decrease DC bus voltage with increased load current due to droop action. The distributed secondary control method is used in this paper to improve the performance of DC microgrid. The main advantages of this control are: high reliability, equal load sharing among sources and improved voltage regulation. A MATLAB simulation was carried out to validate the performance of this method.

Keywords: distributed control; droop control; dc microgrid; voltage regulation; current sharing accuracy

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Synthesis of poly (acrylonitrile)-grafted sodium salt of partially carboxymethylated tamarind kernel powder (Na-PCMTKP) using potassium persulphate/ascorbic acid as a redox initiating system.

Kinnari.A. Bhatt[1], Jignesh. H. Trivedi[2], Kirit. H. Patel[3], Harikrishna. C. Trivedi[4]

[1] Organic Chemistry Department, Institute of Science and Technology for Advanced Studies & Research (ISTAR), The Charutar Vidya Mandal (CVM) University, Vallabh Vidyanagar 388120, Gujarat, India

[2,3] Department of Chemistry, Sardar Patel University, Vallabh Vidyanagar 388120, Gujarat, India

[4] TeamLease Skills University, ITI Campus Tarsali, Vadodara-390009, Gujarat, India

Abstract

Acrylonitrile was grafted onto sodium salt of partially carboxymethylated tamarind kernel powder (Na-PCMTKP) using potassium persulphate (KPS) and ascorbic acid (AA) as redox initiators in an aqueous medium. The optimum reaction conditions have been established by varying reaction variables including concentration of AA, KPS, monomer and amount of backbone as well as time and temperature. The influence of these reaction conditions on the grafting yields (%G and %GE) is discussed. The proposed reaction mechanism could explain very well the experimental results. The FT-IR spectroscopy, Thermal Gravimetric Analysis (TGA), and Scanning Electron Microscopic (SEM) techniques have been used for the characterization of newly synthesized graft co-polymer (Na-PCMTKP-g-PAN).

Keywords: sodium salt of partially carboxymethylated tamarind kernel powder, Ascorbic Acid, Potassium persulphate, optimized reaction conditions, graft copolymerization, TGA.

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Time series forecasting Electric Vehicle sales market of INDIA

Brijeshkumar Patel[1], Dr. Nikunj R Patel[2], Dr Kashyap Mokariya[3], Hetal Prajapati[4]

[1]Research scholar Gujarat Technological University Ahmedabad

[2]SSAS Institute of Technology Surat, Gujarat

[3]Governmnet Enginnering College Valsad

[4]Parul University, Vadodara, Gujarat

Abstract

Accurate sales predictions can help inform business decisions, infrastructure planning, and for government
Policies makers. Time series modeling and forecasting, a technique that forecasts future values by examining past values, are crucial in many practical sectors when it comes to the Indian electric vehicle (EV) market. In this study, the monthly and annual sales data for ICE (internal combustion engine) and (EV) vehicles from 2014 to 2022 have been evaluated using SARIMA (Seasonal Autoregressive Integrated Moving Average), linear regression, and polynomial regression. A detailed explanation of model selection and forecasting accuracy is presented. The results indicate a significant achievement for the EV industry, and it is in align with goals set by Governments and automakers to promote the transition to electric vehicles.

Keywords: Electric Vehicle forcast, Linear Regression, Polynominal Regression, SARIMA model.

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An Automatic Droop Controller For Minimization of Circulating Current and Load Sharing Error in Low Voltage Independent DC Microgrid

Shilpa Patel[1], Dr. Rajnikant Bhesdadiya[2], Dr. Hitesh Karkar[3]

[1] Research Scholar, Gujarat Technological University, Ahmedabad, India

[2] Assistant Professor, L. E. College, Morbi, India

[3] Assistant Professor, Government Engineering College, Rajkot, India

Abstract

The DC microgrid has gained popularity due to its ability to integrate green energy sources, storage units and loads on a common DC bus. However, load sharing remains a significant challenge in DC microgrid. The droop control method is a common practice to address load sharing challenges in microgrid, offering advantages such as simplicity, robust control, and communication independence. This research work presents the design and analysis of an automatic droop controller to reduce load sharing error and minimize circulating current in a low voltage independent DC microgrid. The controller, which relies on the output current of an individual converter, aims to minimize issues of circulating current and load sharing error. The proposed controller enhances simplicity and flexibility, achieving a more favorable balance between voltage regulation and load sharing accuracy in a low voltage independent DC microgrid. The effectiveness of the controller is assessed using MATLAB Simulink.

Keywords: Load sharing; DC-DC Parallel converters; circulating current; Droop resistance; Voltage regulation.

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Influence of maternal variables on nutritional status among children under five years

Tejashri Trivedi[1], V.H. Patel[2], Rema Subhash[3]

1,2,3 Laboratory of Foods and Nutrition, P.G. Department of Home Science, Sardar Patel University, Vallabh Vidyanagar -388120, Gujarat, Anand, India

Abstract

Women exhibit unique nutritional needs across lifespan, especially during pregnancy and breastfeeding, critical period of nutritional vulnerability. Similarly, the nutritional care of children under five in their first 1000 days holds immense importance. Many factors greatly influence a child's capacity to grow, learn and flourish including maternal factors which leads to undernutrition among the children under the age of five years. The present study aimed at to find out the effect of various maternal factors on the prevalence of underweight, stunting and wasting among under-five children. A community based cross sectional study was conducted using simple random sampling from some selected regions of Anand district in Gujarat. Children under five years and their mothers were targeted in the study. Information regarding various maternal factors was collected using structured and pre tested questionnaire. Body weight, height and mid upper arm circumference of the children were recorded using standard anthropometric procedure. Data obtained was analyzed for Chi Square test to study the association at a minimum significance level of 0.05. The findings reveal that prevalence of stunting among children was higher where the mother's age was above 30 years. Mother's age showed significant effect ($p<0.05$) on the prevalence of underweight. Maternal educational status and gap between two children were identified as the most significant determinants of child's nutritional status. Lastly the higher percentage of moderately underweight children and moderately stunted children reflects the necessity of maternal awareness regarding improvement of nutritional status of children. This implies that overall improvement of female's nutritional status and knowledge will be helpful in determining good nutritional status of the children in the society and thereby constructing the healthy nation in future.

Keywords: Maternal factors, Nutritional status, under-five children

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Exploring the Association between Exclusive Breastfeeding and Developmental Milestones in Infancy

Alpa Rathod[1], Viraj Roghelia[2]

[1] S. M. Patel College of Home Science, Sardar Patel University, Vallabh Vidyanagar, Gujarat, India

[2] P.G. Department of Home Science, Sardar Patel University, Vallabh Vidyanagar, Gujarat, India

Abstract

Breastfeeding stands as an unique method of supplying optimal nourishment to the infant. Exclusive breastfeeding play an important role in overall development of an infant. The present study is planned to explore the association between Exclusive breastfeeding and attainment of developmental milestone in infamy. For this 200 mothers having 6 to 12 months old infants, residing in Anand or Vallabh Vidyanagar. The information regarding personal details, information regarding breastfeeding practices, and information related to the achievement of developmental milestones. The information were collected to self prepared questionnaire. The result reviews that the infants who were exclusively breastfed for 6 months have attend the developmental milestones earlier as compared to the infant who were breast feeding less than 6 months. The study concludes that exclusively breastfeeding for 6 months can be promoted among mothers for overall development of the child.

Keywords: Exclusive Breast feedin, Developmental Milestone, Infancy.

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Next Generation Technologies for 5G and Beyond Networks: Overview, Recent Trends, and Challenges

Haresh L. Judal[1], Avani Vithalani[2], Shahid S. Modasiya[3]

[1] Assistant Professor, E& C Engineering Department, Government Engineering College, Patan, Gujarat, India

[2,3] Assistant Professor, E& C Engineering Department, Government Engineering College, Gandhinagar Sector 28, Gujarat, India

Abstract

The global rollout of the fifth generation (5G) has recently started. 5G networks are designed to offer exponential increase in data rate, ultra-reliability, mass connection, and particular low-latency applications. However, 5G will not be able to meet all of the demands of the coming technological advances in 2030 and beyond. In comparison to 5G networks, sixth-generation (6G) cognitive radio (CR) networks are expected to introduce novel use cases and performance metrics, such as providing global coverage, cost efficiency, increased radio spectrum, energy intelligence, and safety. The growing global demand for ultra-high spectral efficiencies, data rates, speeds, and bandwidths in next-generation wireless networks motivate researchers to investigate the peak capabilities of massive MIMO (multiple input multiple output) and new technique filter bank multi carrier (FBMC). Lower out-of-band emissions is observed in FBMC technique compared to orthogonal frequency division multiplexing (OFDM), which is an essential requirement of upcoming next generation wireless systems. Arbitrarily larger SNR value obtained with higher number of BS antennas in Massive MIMO, which help to increase the data rate. This paper describes major enabling technologies for next-generation wireless communication, as well as its challenges.

Keywords: MIMO, OFDM, FBMC, 4G, 5G, 6G

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Exploring the Association between Exclusive Breastfeeding and Developmental Milestones in Infancy

Alpa Rathod[1], Viraj Roghelia[2]

[1] S. M. Patel College of Home Science, Sardar Patel University, Vallabh Vidyanagar, Gujarat, India

[2] P.G. Department of Home Science, Sardar Patel University, Vallabh Vidyanagar, Gujarat, India

Abstract

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Keywords: Exclusive Breast feedin, Developmental Milestone, Infancy.

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[1] Assistant Professor, E& C Engineering Department, Government Engineering College, Patan, Gujarat, India

[2,3] Assistant Professor, E& C Engineering Department, Government Engineering College, Gandhinagar Sector 28, Gujarat, India

Abstract

The global rollout of the fifth generation (5G) has recently started. 5G networks are designed to offer exponential increase in data rate, ultra-reliability, mass connection, and particular low-latency applications. However, 5G will not be able to meet all of the demands of the coming technological advances in 2030 and beyond. In comparison to 5G networks, sixth-generation (6G) cognitive radio (CR) networks are expected to introduce novel use cases and performance metrics, such as providing global coverage, cost efficiency, increased radio spectrum, energy intelligence, and safety. The growing global demand for ultra-high spectral efficiencies, data rates, speeds, and bandwidths in next-generation wireless networks motivate researchers to investigate the peak capabilities of massive MIMO (multiple input multiple output) and new technique filter bank multi carrier (FBMC). Lower out-of-band emissions is observed in FBMC technique compared to orthogonal frequency division multiplexing (OFDM), which is an essential requirement of upcoming next generation wireless systems. Arbitrarily larger SNR value obtained with higher number of BS antennas in Massive MIMO, which help to increase the data rate. This paper describes major enabling technologies for next-generation wireless communication, as well as its challenges.

Keywords: MIMO, OFDM, FBMC, 4G, 5G, 6G

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A Study to Explore the Facotrs Affecting Online Buying Behaviour of College Going Girls

Ms. Kiran Patel[1], Dr. Nidhi Gupta[2]

[1] Research Scholar, Department of Family Resource Management, S. M. Patel College of Home Science, Sardar Patel University, Vallabh Vidyanagar

[2] Head, Department of Family Resource Management, S. M. Patel College of Home Science, Sardar Patel University, Vallabh Vidyanagar

Abstract

The 21st century is marked by a technological innovation era, and shopping has become a crucial aspect of individuals' lives. Numerous obstacles are encountered in physical shopping, and the COVID-19 pandemic has significantly shifted people's preferences towards online shopping. Consequently, online purchasing has become increasingly prevalent. It offers a wide array of products from around the world to cater to every type of shopper. This specific research study aims to examine the factors influencing the online buying behavior of female college students. The study involved conducting an online questionnaire survey with 90 college-going female students regarding their online shopping habits. The collected data were analyzed using percentages and chi-square tests and presented through tables and graphs. The findings of this study suggest that the availability of a diverse range of products online and flexible payment options contribute significantly to the growing popularity of online shopping among college girls. The study will be beneficial for researchers, e-policy makers, e-startups, and students interested in examining online purchasing behavior.

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Hand Gesture Recognition and Motion Detection System for Interactive Applications

Prof. Sangeeta Kurundkar[1], Aditi Taru[2], Vedant Bhagwan[3], Sakshi Adhav[4], Himanshu Bendale[5], Samruddhi Chavan[6], Utkarsha Dongarjal[7]

[1,2,3,4,5,6,7] Department of Electronics & Telecommunication Engineering, Vishwakarma Institute of Technology, Pune, India.

Abstract

Security systems and interactive multimedia applications are two examples of the many fields in which Gesture Sense (GS) technology, a significant development in human-computer interaction, has found use. This paper introduces the "Arduino Hand Gesture Identification and Motion Detection System," a revolutionary combination of Python, Arduino Uno R3, and ultrasonic sensors intended to improve interactive apps through accurate gesture identification. Real-time tracking of hand movements is made possible by ultrasonic sensors, which are renowned for their fine-grained motion detection capabilities. Python allows the Arduino Uno R3 to run complex gesture detection algorithms. A user's engagement is improved by an LCD that presents recognized gestures and status updates, which provides immediate visual feedback. The system's outstanding accuracy, responsiveness, and usability are demonstrated by severe testing, which shows that it typically recognizes objects with an accuracy of 93%. In the context of interactive applications, this research study demonstrates how GS technology has the potential to revolutionize user experiences by ensuring seamless and immersive interactions.

Keywords: Interactive application, Human-computer interaction, Hand gesture recognition, Motion detection.

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Parametric Optimization of Valve Body produced with FDM using PLA and ABS materials.

Khushbu Patel[1], Shailee Acharya[2], G. D. Acharya[3]

[1] Research Scholar, Gujarat Technological University, Ahmedabad, Gujarat 382260, INDIA

[2] Assistant Professor, SVIT, Vasad, Gujarat, INDIA

[3] Emeritus, Aatmiy University, Rajkot, Gujarat, INDIA

Abstract

In recent years, it has been admiring remarkable progress. 3D printing offers creative options for meeting a variety of engineering-related requirements. Acrylonitrile Butadiene Styrene (ABS) and Poly Lactic Acid (PLA) two main materials selected for the Fusion Deposition Modelling (FDM) 3D printer. The purpose of this study is to compare the effects of the material on the process variables and optimize the valve body's chosen process parameters. Layer Height, Orientation Angle, and Infill Density are chosen for the input parameters, while Surface Roughness, Dimensional Deviations and Tensile Strength are chosen for the responses. For Multi Objective Optimization, PLA and ABS materials are subjected to a Grey Relational Analysis (GRA). The PLA and ABS valves are compared to one another and assessed. The findings indicate that the best model parameters are 40% infill density, 0.2 mm layer height, and 90° orientation angle, with infill density having the most influence.

Keywords: 3 D Printing; FDM; ABS; PLA; GRA.

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An Experimental Approach on Mechanical Properties of Engineered Cementitious Composites Using Glass and Polyester Fibers

Vipul Solanki[1], Khadeeja Priyan[2], Pratiti Bhatt[3], Nandan Patel[4], Jignesh Brahmbhatt[5], Shailesh Pal[6]

[1] PhD Scholar, Civil Engineering Department C.V.M University, V.V. Nagar, India

[2] Assistant Professor & Head Civil Engineering Department, G. H. Patel College of Engineering & Technology, V.V. Nagar, Gujrat, India

[3] Professor, Structural Department, Birla Vishvakarma Mahavidyalaya Engineering College, V.V. Nagar, Gujarat, India

[4] Professor, Civil Engineering Department, B & B Institute of Technology, V.V. Nagar, Gujarat, India

[5] Assistant Professor, Civil Department, Birla Vishvakarma Mahavidyalaya Engineering College, V.V. Nagar, Gujarat, India

[6] Assistant Professor, Civil Department, Dr. Jivraj Mehta Institute of Technology, Anand, Gujarat, India

Abstract

The building sector is becoming increasingly concerned about sustainability. Due to their resilience to cracks and capacity for self-healing, Engineered Cementitious Composites (ECC) offer the potential to lower the carbon and footprints of the built environment. Continuous efforts have been made over the past ten years to create a greener ECC. The use of more environmental responsive binders, fillers, and fibers can broadly categories these activities. This study employed M45 ECC mixture of fly ash – Cement ratio (FA/C) of 1.2 by mass and water / binder ratio of 0.24. The mechanical characteristics of ECC are reinforced with Glass and Polyester fibers of 1%, 1.5%, and 2% each were experimentally investigated. For ECC mixes with varying percentages of fibers, compressive and flexural strength with depth specimen of 50 mm and 75 mm is compared to conventional concrete (M45). In the current study, bendable concrete has a higher flexural strength for beam specimen depth of 50 mm and 75 mm than conventional concrete, indicating the importance of glass fibers in imparting ductility energy. The same can be achieved by incorporating Polyester fibers, indicating the key element in achieving bendable concrete.

Keywords: ECC, Glass Fiber, Polyester Fiber, Compressive Strength, Flexural Strength

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Coordination of Protective Relays in the Distribution System using Self-Adaptive Harris Hawks Optimization

Rakhi Bakhla[1], Kumari Sarwagya[2], Suman Ranjan[3]
[1] Dept. of Electrical Engineering, BIT Sindri, Dhanbad, India
[2] Dept. of Electrical Engineering, GEC Arwal, Bihar, India
[3] Dept. of Electrical Engineering, BIT Sindri, Dhanbad, India

Abstract

Protection of the power distribution networks is becoming increasingly complex as more and more distributed generators are integrated into the grid. This complexity poses a challenge to the optimal coordination of directional overcurrent relays (DOCRs), in this work, a optimization algorithm called Harris Hawks Optimization (HHO) is used to resolve the DOCR coordination problem. HHO is a population-based algorithm that is well-suited for the resolution of extremely nonlinear optimization challenges. HHO mimics the hunting behavior of Harris Hawks to guarantee the exploitation of the area defined between possibilities. Various defect data generated on the IEEE 3-Bus, 8-Bus, and 15-Bus test systems. The findings demonstrate that HHO is more effective than recently released optimization techniques for DOCR coordination in terms of the total operating time of primary relays. HHO is also robust in maintaining coordination between primary and backup relay pairs. Overall, HHO is an algorithm that has the potential to greatly enhance the coordination of DOCRs. This can lead to improved power system reliability and reduced operating time.

Keywords: Distribution network, Directional overcurrent relay (DOCR), Harris Hawks Optimization (HHO) algorithm, Optimal relay Coordination.

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Automating Customer Service using Lang Chain Building custom open-source GPT Chatbot for organizations

Keivalya Pandya[1], Prof. Dr. Mehfuza Holia[2]
[1]Researcher, Birla Vishvakarma Mahavidyalaya
[2]Assistant Professor, Birla Vishvakarma Mahavidyalaya

Abstract

In the digital age, the dynamics of customer service are evolving, driven by technological advancements and the integration of Large Language Models (LLMs). This research paper introduces a groundbreaking approach to automating customer service using LangChain, a custom LLM tailored for organizations. The paper explores the obsolescence of traditional customer support techniques, particularly Frequently Asked Questions (FAQs), and proposes a paradigm shift towards responsive, context-aware, and personalized customer interactions. The heart of this innovation lies in the fusion of open-source methodologies, web scraping, fine-tuning, and the seamless integration of LangChain into customer service platforms. This open-source state-of-the-art framework, presented as "Sahaay," demonstrates the ability to scale across industries and organizations, offering real-time support and query resolution. Key elements of this research encompass data collection via web scraping, the role of embeddings, the utilization of Google's Flan T5 XXL, Base and Small language models for knowledge retrieval, and the integration of the chatbot into customer service platforms. The results section provides insights into their performance and use cases, here particularly within an educational institution. This research heralds a new era in customer service, where technology is harnessed to create efficient, personalized, and responsive interactions. Sahaay, powered by LangChain, redefines the customer-company relationship, elevating customer retention, value extraction, and brand image. As organizations embrace LLMs, customer service becomes a dynamic and customer-centric ecosystem.

Keywords: Customer Service Automation, Large Language Models, LangChain, Web Scraping, Context-Aware Interactions

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From Threats to Solutions: A Literature Review on Security Issues in eLearning Platforms

Saroj Junghare[1]

[1] Research Scholar Prof. Mridula Dube, Director, UICSA, R. D. University, Jabalpur (M.P.), India. R. D. University, Jabalpur (M.P.), India.

Abstract

E-Learning provides flexible and affordable education to all. Recent shift towards e-learning has encouraged the use of digital platforms. The use of e-learning platforms as a means of delivering educational content has become increasingly popular in recent years. Huge amount of and various types of data of users are stored on these e-learning platforms. However, with this growth comes an increased need for security in e-learning platforms. In this paper, we have examined some previous works done by researchers to uncover and notify the types of information security problems faced by e-learning platforms and it also focuses on the problems faced by teachers and learners. The paper also recommends the countermeasures proposed in previously published research papers. The paper also reviews the various blogs and articles related to security problems faced in India by e-learning platforms or e-learning industry. It also gives an overview of role of e-learning in India. Elearning is more vulnerable especially from the security, privacy and process viewpoint. By doing this literature review, it will be beneficial for those who want to configure an e-learning platform in their institution; they will already know what problems teachers and students face in e-learning platforms regarding security and what their solutions are.

Keywords: E-learning, E-learning platforms, Information Security, Threat, Risk, Vulnerability, Countermeasures.

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Transforming Textile Waste into Sustainable Construction Materials: A Comprehensive Study

Pinkal Rameshbhai Chauhan[1], **Dr. J. R. Pitroda**[2], **Dr. Reshma L. Patel**[3], **Prof. (Dr.) Indrajit N. Patel**[4]

[1] Final Year, M.Tech. (Civil) Construction Engineering and Management, BVM Engineering College, Vallabh Vidyanagar – Gujarat – India.

[2] Associate Professor, PG Coordinator Construction Engineering and Management, Civil Engineering Department, BVM Engineering College, Vallabh Vidyanagar– Gujarat – India.

[3] Assistant Professor, PG Coordinator Environmental Engineering, Civil Engineering Department, BVM Engineering College, Vallabh Vidyanagar – Gujarat – India.

[4] Professor & Principal, Structural Engineering Department, BVM Engineering College, Vallabh Vidyanagar – Gujarat – India.

Abstract

The textile industry in India is of significant importance due to its extensive historical legacy that spans numerous centuries. However, the increase in industrialization has led to a proportional escalation in the production of waste. The effective management of textile waste is a matter of great importance, commonly addressed by practices such as ground dispersal or landfill disposal. Unfortunately, the effectiveness of landfilling in metropolitan areas may be impeded by the constrained availability of land. Scholars have undertaken investigations to explore the potential utilization of textile sludge for the production of eco-friendly construction materials as a means to address this issue. This involves the usage of it as a partial substitute for fine aggregate, cement, and clay in non-structural construction components, such as environmentally friendly building blocks, clay bricks, mortar, concrete, and paver blocks. The present study offers a thorough assessment of the manufacturing process of the aforementioned materials and suggests the most favourable parameters for their use.

Keywords: Cement, Concrete, Construction, Compressive Strength (CS), Sludge, Textile Industry Waste

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Prior Stage Kidney Disease Prediction with AI & Supervised Machine Learning Techniques

Bhalala Ronak B.[1], Vadehi Dipak shah[2], Vandita Dipak shah[3]

[1] Dept. of Computer Engineering (CS), GTU-GSET, Ahmedabad, Gujrat, India

[2] Dept. of Computer Science and application, Shreyarth University, Ahmedabad, Gujrat, India

[3] Dept. of Computer Science and application, Shreyarth University, Ahmedabad, Gujrat, India

Abstract

A featureless abnormality of kidney function or kidney function that lasts months or years is known as chronic kidney disease. People considered to be at risk for kidney issues, such as: are typically screened for chronic kidney disease. As a result, early diagnosis and treatment are essential to preventing sickness. The results of this study recommend using CKD machine learning methods such KNN, DT, NB, and SB classifiers.

Keywords: SB classifiers, Chronic kidney dieses, NB, and KNN, DT.

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AZFa sub-region microdeletion screening for infertility in males

Mansi Dadhania[1], Jenabhai Chauhan[2]

[1,2] P.G. Department of Genetics, Ashok and Rita Patel Institute of Integrated Study & Research in Biotechnology and Allied Science (ARIBAS), CVM University, Vallabh Vidyanagar, Anand.

Abstract

The term infertility is disease of the male or female reproductive system defined by failure to achieve a pregnancy after 12 months or more of sexual intercourse. It is major health problem affecting 15% of couples worldwide. About 9% of male and 10% of female aged between 22-44 reported infertility problems. Approximately 10-15% of infertile men are azoospermic. Ychromosome microdeletions represent the absence of DNA segments from the Y- chromosome especially azoospermia factor (AZF) and is considered the most common genetic cause of male infertility. In the present study genomic DNA was isolated by using phenol/chloroform extraction protocol. Molecular genetic analysis using STS-PCR helps us to identify microdeletions in Y chromosome specifically in AZFa sub-region. Total 50 samples analyzed for sperm morphological defects and Y-chromosome microdeletions. The prevalence of deletion at AZFa sub region was 0% in the present study due to limited numbers of STS markers and sample size.

Keywords: Male infertility, Y chromosome microdeletions, STS-PCR

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Determination of Genotypic Pattern of ß- Casein in Indian Local, Crossbred and Exotic Cattle

Shailja Vyas[1], Jenabhai Chauhan[2]

[1] Research Scholar, P. G. Department of Genetics, Ashok & Rita Institute of Intergrated Study & Research in Biotechnology and Allied Sciences (ARIBAS), CVM University, Vallabh Vidhyanagar.

[2] Associate Professor, P. G. Department of Genetics, Ashok & Rita Institute of Intergrated Study & Research in Biotechnology and Allied Sciences (ARIBAS), CVM University, Vallabh Vidhyanagar.

Abstract

Most of human populations have long relied on milk from dairy cows as a high-quality source of protein and calcium. Numerous breeds of dairy cattle have been identified to have the beta-casein locus. Only position 67, which is histidine in A1 milk or proline in A2 milk, separates the A1 & A2 variations. During intestinal digestion, A1 milk is known to release the peptide betacasomorphin-7 (BCM-7). Which are associated with human heart disease, diabetes mellitus and Autism. A2-casein is typically regarded as safe for human consumption when choosing cows for increased milk yields and milk quality. Therefore, present research was conducted to determine pattern of genotypes (A1A1, A2A2 & A1A2) in our Indian local and Crossbred animal using PCR-RFLP techniques. 50 animals were genotyped for beta casein by PCR-RFLP techniques. 34 animals has A2A2 genotype where as 16 animals has A1A2 genotype. A2 variant of beta casein are most prevalance is studied population.

Keywords: Cattle, Beta casein gene, A2 milk, PCR – RFLP

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Reconfigurable Graphene based Flexible Antenna for switching in-between LTE band and L5 band

RonakVashi[1], Anish Vahora[2], Parul Panchl[3]

[1,2,3] Birla Vishvakarma Mahavidyalaya (Engineering College) (Gujarat), India

Abstract

A Graphene based reconfigurable dual-band antenna using Kapton polyimide has been proposed. In a reconfigurable antenna, the PIN diode is used to alter the antenna's operating frequency by changing its electrical length or impedance. The choice of operating frequency is determined by the bias voltage applied to the PIN diode and the antenna's design. The proposed antenna can switch the frequency bands between 900 MHz and 1.37 GHz. The antenna has an overall dimension of 30 mm × 34 mm × 0.1 mm, with a novel graphene monopole antenna on a Kapton polyimide material is used. The antenna resonates at different frequency bands depending upon the feed line length. Hence the frequency re-configurability is achieved by switching of PIN Diode. When the length of the monopole line is 65 mm antenna resonates at 1.37 GHz with an impedance bandwidth of 22.22% (1.2–1.5 GHz). For the total line length of 130 mm antenna resonates at 0.90 GHz with an impedance bandwidth of 24.17% (0.8–1.02GHz).

Keywords: Reconfigurable, Flexible, Graphene antenna, Kapton polyimide.

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Review of Different Approaches for Detecting Emotion from Text

Khushbu Gupta[1], Archana Thakur[2]

[1] Department of Computer Science, St. Aloysius College, Jabalpur – 482002, Madhya Pradesh, India

[2] School of Computer Science and IT, Devi Ahilya Vishwavidyalaya, Indore – 452001, Madhya Pradesh, India.

Abstract

Emotion analysis also referred to as affective computing or sentiment analysis constitutes a specialized field within data mining and natural language processing (NLP). This review paper offers an extensive analysis of sentiment analysis methods applied in a variety of contexts. It compiles various studies that seek to comprehend and assess sentiment in different textual data sources, such as movie reviews, social media posts, educational forums, and product evaluations. The primary objectives of these studies vary, encompassing sentiment classification, sentiment prediction, and opinion mining. This review delves into the core discoveries and strategies employed in each study, shedding light on the datasets utilized, the techniques applied, the most effective methods, the tools employed, and the limitations, benefits, and downsides of each approach. Moreover, it explores potential future research paths and opportunities to enhance sentiment analysis techniques.

Keywords: Sentiment analysis, Naïve Bayes, Support Vector Machines, and ensemble methods.

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Leveraging Back Propagation Networks for Effective Denoising

S. Gowri[1], Judith Justin[2]

[1] Assistant Professor, Department of Biomedical Instrumentation Engineering,
Avinashilingam Institute for Home Science and Higher Education for Women, Coimbatore

[2] Professor, Department of Biomedical Instrumentation Engineering,
Avinashilingam Institute for Home Science and Higher Education for Women, Coimbatore

Abstract

Speech signal denoising is vital in enhancing the quality and intelligibility of audio signals in various applications, including speech recognition, telecommunications, and hearing aids. This study focuses on applying Backpropagation Neural Networks (BPN) for speech signal denoising and provides a comparative analysis with other existing denoising algorithms. The proposed approach leverages the capabilities of BPN, a widely used and effective machine learning technique, to learn the underlying patterns and relationships in noisy speech signals. The BPN model is trained using a large dataset of clean and noisy speech signals, enabling it to estimate and suppress noise components while preserving the desired speech characteristics. The performance of the BPN-based denoising approach is compared with state-of-the-art denoising algorithms, including spectral subtraction, Wiener filtering, and Non-negative Matrix Factorization (NMF). Objective evaluation metrics such as Peak Signal-to-Noise Ratio (PSNR), Perceptual Evaluation of Speech Quality (PESQ), and Short-Time Objective Intelligibility (STOI) are utilized to assess the denoising quality and intelligibility of the processed speech signals. The experimental results demonstrate that the BPN-based approach outperforms the other denoising algorithms in terms of both objective and subjective evaluations.

Keywords: speech denoising, BPN, NMF, Spectral subtraction

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Multimodal Hybrid Deep Learning Techniques for Feature Extraction from Video for Video Classification

Priyanka Panchal[1], Dr. Dinesh J. Prajapati[2]
[1]Assistant Professor, Madhuben & Bhanubhai Patel Institute of Technology & PhD, Research Scholar, Gujarat Technological University, Ahmedabad)
[2]Associate Professor, A. D. Patel Institute of Technology

Abstract

Videos have very rich semantic content. Nowadays, video classification has gained much attention as a result of the exponential growth in video content. Conventional handcrafted features are limited in their ability to analyze complex video semantics. Nowadays, there has been significant growth in the development of deep neural networks (DNNs) for video analytics. This is due in part to the success story of deep learning techniques during the analysis of the sequence of frame i.e. image, audio, and text data. One of the most practical applications of DNNs for video analytics is categorizing videos into their main Semantic labels, such as "skiing". One of the critical steps in video classification is feature extraction, which aims to capture essential information from videos based on that video classification is to occur. The proposed approach combines the powerful benefits of both Convolutional Neural Networks (CNNs) followed by temporal difference networks (TDN), networks to feature extraction the video frames and temporal sequences. In particular, first apply a pre-trained CNN model on video for frame-level features extraction, after that these features are incorporated into an temporal difference network (TDN), to capture the temporal dynamics on Benchmark datasets UCF101 were used to evaluate proposed method and evaluate it against several state-of-the-art methods. This paper presents a novel approach for video classification and the proposed model deep learning model that combines the strengths of two different deep learning techniques that can take advantage of a wide variety of multimodal information. The proposed method concatenates extracted features, spatial and temporal using a CNN and a TDN, respectively. The features that have been extracted are then load to a LSTM classifier which result is used for video classification. The outcome of the experiment shows that evaluating the efficacy of our proposed method, achieving higher classification accuracy, and outperforming other methods in most cases.

Keywords: Convolutional neural networks, Deep Learning, LSTM, Video Classification, Keyframe extraction

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Enhancing Heart Disease Risk Prediction Through Machine Learning Techniques: A Review

Anjali S. Patel[1], Prof. Ankur Goswami[2]
[1] Department of Computer Engineering, Sankalchand Patel University, Visnagar, India
[2] Assistant Professor, Department of Computer Engineering, Sankalchand Patel University, Visnagar

Abstract

Currently, cardiovascular disease (CVD), often known as heart disease, kills 30% of all documented deaths worldwide. Heart disease, especially heart attacks, is the leading cause of death worldwide. To improve patient outcomes and save healthcare costs, heart attack forecasting must be accurate and timely. At times, the accuracy of heart attack prediction systems utilizing machine learning may be compromised, leading to potential inaccuracies in decisions made by medical practitioners. Machine learning is very useful in various sectors in today's world. Our study's findings show that the heart attack prediction model based on machine learning is highly accurate. Those at higher risk of having a heart attack are accurately identified by the program, allowing for timely intervention and individualized preventative care. Healthcare workers may benefit from using this prediction model in clinical practice by using it to make more informed decisions about patient management and treatment plans. The incidence of heart attacks and associated medical expenses may be reduced as a result of early identification of heart attack risk factors, which may prompt changes in lifestyle, medication dosage, and focused therapies. In this paper we have tried to review the number of Literature papers and identifies the research gap.

Keywords: Machine Learning; Health Care; Heart Disease

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Comparative Analysis of Traditional K-Means and Hybrid K-Means Algorithm

Riya Agrawal[1], Mrunal Gund[2], Ulka Chaudhari[3], Vitthal Gutte[4]

[1] School of Computer Engineering and Technology, MITWPU, Pune, India

[2] School of Computer Engineering and Technology, MITWPU, Pune, India

[3] School of Computer Engineering and Technology, MITWPU, Pune, India

[4] Department of Computer Engineering and Technology, MITWPU, Pune, India

Abstract

This paper examines the effectiveness of a hybrid approach that combines K-Means and Sunflower Optimization Algorithm (SOA) to improve clustering performance. Through experiments on various datasets, we compare the capabilities of this hybrid approach to traditional K-Means. Our initial findings suggest that the Hybrid K-Means-(HSFO) algorithm surpasses K-Means in terms of clustering quality and convergence speed, although its performance may vary depending on the dataset. This study introduces a promising technique for clustering research by combining local and global optimization methods.

Keywords: Clustering, K-Means, Sunflower Optimization Algorithm, Hybridization, Comparative Analysis, Data Mining.

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Assessing the Impact of Tunnelling on Ground Settlements: Methods and Innovations

Ankush Dilipbhai Patel[1], Dr. J. R. Pitroda[2], Dr. Reshma L. Patel[3]

[1] First Year, M.Tech. (Civil) Construction Engineering and Management, BVM Engineering College, Vallabh Vidyanagar – Gujarat – India.

[2] Associate Professor, PG Coordinator Construction Engineering and Management, Civil Engineering Department, BVM Engineering College, Vallabh Vidyanagar– Gujarat – India.

[3] Assistant Professor, PG Coordinator Environmental Engineering, Civil Engineering Department, BVM Engineering College, Vallabh Vidyanagar – Gujarat – India.

Abstract

The purpose of this review study is to outline the methods, tactics, and techniques for assessing the effects of tunnelling on ground settlements. Tunnelling operations put neighbouring structures at risk by creating vibrations, heaves, and subsidence that make the structure more brittle. Conurbations become increasingly congested as the urban population increases, and traffic delays are common. In this case, making use of the underground space has worked well to address the problems at hand. This work aims to develop a new approach for identifying the three-axis orientations of a tunnel-boring machine (TBM) during pipe-jacking and micro-tunnelling operations. In order to apply high-performance drill and blast technologies for tunnel construction, each of the numerous working components that make up the construction process must be optimized and taken into account as a system of simultaneous and sequential operations. Tunnel-boring machines are essential tools for the development of trenchless underground design projects, such as rail travel, civil design, railroad tunnels, and so forth. For the transportation networks to be improved, especially in crowded cities, tunnel construction is one of the most important infrastructure projects. Because they offer a unique aptitude and flexibility for the excavation of soft to medium-strength rock formations, road headers are commonly used in underground mining and tunneling activities.

Keywords: Empirical method, analytical method, numerical method, tunnelling method, Tunnel Construction

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Evaluation of strength and comparative study on silica fume

Vishal Nihalani[1], Aashish Chhatani[2], Prof. Dr. Deepa Sinha[3], Prof.Nekzad Umrigar[4]

[1,2] B.Tech Student, Department of Civil Engineering, Birla Vishvakarma Mahavidyalaya Engineering College, Vallabh Vidyanagar Anand (388120)

3 Associate Professor, Department of Structural Engineering, Birla Vishvakarma Mahavidyalaya Engineering College, Vallabh Vidyanagar Anand (388120)

4 Assistant Professor, Department of Civil Engineering, Birla Vishvakarma Mahavidyalaya Engineering College, Vallabh Vidyanagar Anand (388120)

Abstract

Since advent of civilization various types of cementitious materials have been used for construction practices. The arrival of Ordinary Portland Cement (OPC) changed the construction activities completely. However, because of several drawbacks associated with properties of cement and manufactured building materials such as OPC as well as the cost factor attempts one mode to utilize other materials for economical constructions and improved mortar and concrete characteristics. About 8-10% of CO2 emissions are generated from concrete production and transportation. Global warming gas is released when the raw material of cement, limestone and clay is crushed and heated in a furnace at high temperature. One ton cement produces approximately one ton of carbon dioxide in atmosphere Also, several waste materials are generated in huge quantities by different industrial activities. Now attempts were made to utilize these waste materials or industrial byproducts in construction activities to solve the environmental pollution problems, and safer and economical construction. Silica fume is one such industrial by product which is being used and experimented upon to obtain a stronger and durable concrete. It is one of the pozzolanas having very large surface area which results in better and uniform utilization of calcium hydroxide released during hydration of OPC. Also, because of its very fine size it act as filler material between the cement gel grains. The use of silica fume as a mineral admixture to produce high strength high performance concretes is gaining importance in recent years. The aim of the study was to investigate the effects of binder systems containing different levels of silica fume on fresh and harden properties of concrete. The work was focused on concrete mixes of grade M-25 having a fixed water cement ratio of 0.45. The percentage of silica fume replaced with cement was: 5%, 10%, and 15%.At 10% replacement of cement with silica fume, it gave the highest compressive strength. And workability was reduced at high silica percentage.

Keywords: Compressive strength, workability, global warming, Silica fume, carbon emission, w/c ratio

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Productivity Improvement for a manufacturing process of Bearing Plate

Purvi Chauhan[1], Khushboo Soni[2], Darshan Patel[3]

[1] Assistant Professor, Department of Production Engineering, Birla Vishvakarma Mahavidyalaya, Vallabh Vidyanagar, Anand.

[2,3] UG Student, Department of Production Engineering, Birla Vishvakarma Mahavidyalaya, Vallabh Vidyanagar, Anand.

Abstract

In basic terms, productivity is defined as a measure of efficiency of an organization assuming the same amount of inputs are given and achieve a maximum output with least wastage of resources and time. Therefore, every organization strives towards achieving more productivity in their manufacturing process which will in turn provide better quality to their customers. There are several areas in industry in which productivity can be improved such as improvement in facilities for manufacturing, reduction in men and material movement, improvement in material handling, change in layout to carry out operations without any disturbance or delay, improvement in ergonomics and safety of workers. This project addressed to set up a facility for manufacturing of Bearing Plate in Casting Industry using sand casting with maximum productivity by utilizing the various Industrial Engineering techniques which will allow them to achieve a desired production rate which will be economical and reliable for the organization.

Keywords: Casting, Plant Layout, Time Study, Motion Study, Productivity, Material Handling

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A Review of Microstructural Evolution in Steel: From Cementite to Spheroids

Mayur H. Mandviwala[1], Purvi D. Chauhan[2]

[1] U.G. Student, Department of Production Engineering, Birla Vishvakarma Mahavidyalaya, V.V.Nagar Anand.

[2] Assistant Professor, Department of Production Engineering, Birla Vishvakarma Mahavidyalaya, V.V.Nagar Anand.

Abstract

This review paper delves into the spheroidization processes employed in steel treatment to achieve softening of the initial structure for improved formability and machinability. Various methods are explored, with subcritical and intercritical annealing being the most common, either in a single cycle or multiple treatment cycles. Crucially, these treatments are executed at temperatures slightly below Ac1 or above it. Spheroidization is attained through the cooperative growth of ferrite and cementite in laminar fashion from austenitized steel or by inducing a divorced eutectoid transformation, which involves non-cooperative movement of ferrite and cementite resulting in a divorced eutectoid structure. Deformation itself enhances spheroidization, and when coupled with appropriate annealing treatment, it leads to reduced annealing times and increased levels of spheroidization. In hypereutectoid steels, the divorced eutectoid transformation (DET) takes precedence over the pearlite reaction at lower austenitizing temperatures and slower cooling rates. Finally, the initial structures of steel play a pivotal role in all spheroidizing processes. This review provides comprehensive insights into the intricate processes, mechanisms and microstructures involved in achieving spheroidization in steel treatment.

Keywords: Heat treatment, Spheroidization annealing, Pearlite, Cementite, Eutectoid temperature, SA/V ratio, D.E.T., Hypereutectoid steel, Effects of Alloying Element on Spheroidization

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A Comprehensive Study of the Destination Recommender System Employing Artificial Intelligence

Bangoria Bhoomi Mansukhlal[1], Dhabaliya Sweety Rajeshkumar[2], Dr. Sweta Sandipkumar Panchal[3], Dr. Sandipkumar Ramanlal Panchal[4]

[1] Research Scholar, Center for Research and Development, Dr. Subhash University, Junagadh, India

[2] PG Scholar, School of Engg. & Tech., Dr. Subhash University, Junagadh, India

[3] Associate Professor, EC Department, Dr. Subhash University, Junagadh, India

[4] Professor, EC Department, Dr. Subhash University, Junagadh, India

Abstract

Recommender Systems (RS) have grown in popularity for delivering personalized recommendations for travelers to make their planning process easier and more efficient. By leveraging user preferences, historical data, and other factors, travel RS can help travelers find the right products and services to enhance their travel experience. The survey covers various aspects of travel such as accommodation, transportation, food, safety, seasonal preferences, which significantly impact a traveler's experience and also includes a discussion of different frameworks for destination-based RS, and the selection parameters, and technological considerations were also explored. Personalized recommendations can make a big difference in this regard. This survey will be a helpful source for anyone interested about developing or using a destination-based RS. It provides a comprehensive overview of destination-related Recommender Systems, making it easier for anyone to understand and implement them.

Keywords: Recommender System, Artificial Intelligence, Personalized Recommendations, Travel Recommendations, Destination-based RS

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Vehicle Tracking Technologies for Speed Measurement: A Comprehensive Study with novel approach

Nikesha Patel[1], Dr. Keyur N Brahmbhatt[2]

[1] Research Scholar, Gujarat Technological University, Chandkheda,

[2] Associate Professor, Birla Vishwakarma Mahavidyalaya, Vallabh Vidyanagar, Anand, Gujarat.

Abstract

Video based analysis of traffic is an active field of research and very useful for applications in smart city development area. Vehicle tracking is major part for many applications in traffic surveillance system. Computer vision come up with techniques and algorithms for moving object. Motion tracking approach in computer vision emphasis on basically two techniques: Object detection and Object tracking. Major of vehicle detection techniques use detect-then-track approach. This paper provides a comprehensive study of video processing techniques for moving vehicle tracking. In this survey, detection based techniques are categorized into two parts: 1) Motion based 2) Learning based. Vehicle tracking techniques are also explained and implementation results are compared for their efficiency and accuracy.

Keywords: Vehicle tracking, Vehicle detection, Speed Measurement, Computer Vision

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Automatic Image Tagging and Retrieval of Images based on Visual Features

Pritesh Pandey[1], Dr. Keyur N Brahmbhatt[2], Dr. Kaushika D. Patel[3], Dr. Narendra M Patel[4]

[1] PhD, Research Scholar, Gujarat Technological University, Ahmedabad

[2] Associate Professor, Information Technology Department, Birla Vishvakarma Mahavidyalaya, Vallabh Vidyanagar

[3] Assistant Professor, Electronics Department, Birla Vishvakarma Mahavidyalaya, Vallabh Vidyanagar

[4] Professor (CAS), Computer Engineering Department, Birla Vishvakarma Mahavidyalaya, Vallabh Vidyanagar

Abstract

One crucial way for finding photographs posted by social users on such social platforms is tag-based image searching. It is difficult to make the top-ranked result for tag-based image search useful and diverse. In comparison to context- and content-based picture retrieval, it is frequently employed in social media. Refinement of social image tags consists of deleting obtrusive or pointless tags and adding pertinent ones. Images are randomly selected as the learning data while the remaining ones are used as the testing data for image tag assignment. Manual annotation has become impossible due to the internet's exponential expansion in image availability. Users cannot find desired photographs without the help of such tags. Therefore, a scalable approach that can handle such a high volume of photos is necessary, and it might be used to create an effective tag-based image result retrieval system. In this study, four distinct models are examined, and a feature extraction method based on deep convolutional neural networks is suggested to learn descriptive semantic characteristics from dataset photos. Then, to assign the proper tags to our images, we employ inverse distance weighted K-nearest Neighbors classifiers along with a number of additional multi-label classification techniques. We use the MSCOCO dataset's numerous image categories to show how well our system works.

Keywords: Content based image retrieval, Multi-Modal data embeddings and search, Automatic Image Annotation, Image tagging, tag-based image retrieval, tag refinement

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Improving Dairy Carton Handling Efficiency with Conveyor-Based Optimization Strategies

Purvi D. Chauhan[1], MohmadMaaz Vhora[2]

[1] Assistant Professor, Department of Production Engineering, Birla Vishvakarma Mahavidyalaya, V.V.Nagar Anand.

[2] U.G. Student, Department of Production Engineering, Birla Vishvakarma Mahavidyalaya, V.V.Nagar Anand.

Abstract

In basic terms, optimization is defined as a process that helps businesses improve their efficiency, increase their productivity and enhance their performance. Therefore, every organization strives towards achieving consistent improvement in productivity of their manufacturing processes which will in turn provide better quality to their customers. Optimizing several areas in industry, which results into increase in productivity such as improvement in facilities for manufacturing, reduction in men and material movement, improvement in material handling, change in layout to carry out operations without any disturbance or delay, improvement in ergonomics and safety of workers. This project addressed to set up a facility for packaging of milk powder carton packaging in dairy industry and its handling without manual interruptions to the storage by utilizing the various Automation techniques which will allow them to achieve a desired use of resources in economical way.

Keywords: Packaging, Plant Layout, Automation, Conveyor system, Labour Cost, Productivity, Material Handling

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Survey on Prediction of Heart Disease Using Data Mining and Machine Learning

Chhaya Zala[1], Krishna Shah[2]

[1] G H Patel College of Engineering and Technology, VVNagar, Anand, Gujarat, India

[2] G H Patel College of Engineering and Technology, VVNagar, Anand, Gujarat, India

Abstract

While the healthcare industry typically has access to a substantial amount of information, regrettably, not all of this data is effectively analyzed and utilized, even though it is crucial for uncovering concealed trends and making informed decisions. Sophisticated data mining techniques are used, particularly in medical research, to extract insights from databases, including the prognosis of diseases like heart disease, cancer, and Alzheimer's disease. Various algorithms, methodologies, and datasets are explored for risk assessment and insights into the strengths and limitations of the process. The system uses simple medical characteristics and attributes to predict a patient's risk of developing heart disease. Some of the data mining techniques like Decision Trees, Naive Bayes, Support Vector Machines, and Neural Networks are used for examining the heart disease database. The effectiveness of these methods is compared, with accuracy serving as the primary metric of assessment. This survey paper tries to present a comprehensive overview of recent advancements and success rates in heart disease prediction using data mining and machine learning.

Keywords: Heart Disease Prediction; Cardiovascular Disease (CVD); Data Mining; Machine Learning; Data Analysis; Healthcare Data; Risk Assessment; Model Improvement

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A systematic computational approach to unveil the potent SNPs of human luteinizing hormone receptor (LHCGR).

Dolly J Patel[1] and Kinnari N Mistry[2]

[1,2] Ashok & Rita Patel Institute of Integrated Study & Research in Biotechnology and Allied Sciences (ARIBAS), The Charutar Vidya Mandal University, Vallabh Vidyanagar-388120, Gujarat, India.

Abstract

Polycystic ovarian syndrome (PCOS) is a prevalent complex endocrine condition among reproductive women. The luteinizing hormone chorionic gonadotropin receptor (LHCGR), which is its receptor, and the related downstream signaling cascade are crucial in the origin of PCOS. Although PCOS risk has been linked to genetic polymorphisms in the LHCGR, evidence to support this remains disputable. The study aims to investigate the impact of single nucleotide polymorphisms (SNPs) in the LHCGR gene on protein function, structure, and stability. The findings revealed that out of 637 missense SNPs in the LHCGR gene, 16 were deleterious to the protein. These SNPs were found to be destructive to the structure and function of the LHCGR molecule and may play a crucial role as molecular determinants of PCOS development.

Keywords: Polycystic ovarian syndrome (PCOS), luteinizing hormone chorionic gonadotropin receptor (LHCGR), single nucleotide polymorphisms (SNPs),

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Data Augmentation approach for Type-2 Diabetes Prediction and Classification

Hitesh B Patel[1], Dr. Keyur Brahmbhatt[2], Dr. Mahasweta Joshi[3]

[1] Research Scholar, Gujarat Technological University, Ahmedabad, Gujarat 382424, India.

[2] Head and Associate Professor, IT Department, BVM Engineering College, VV Nagar, Gujarat 388120, India.

[3] Assistant Professor, Computer Engineering Department, BVM Engineering College, VV Nagar, Gujarat 388120, India.

Abstract

The most serious issue in the health sector nowadays is Type 2 diabetes, as it impacts millions of people by dramatically affecting their lives. Insulin deficiency causes complications, such as macro-vascular, micro-vascular, and neuropathies which are the main complications that can lead to death for diabetic patients. So diagnosing these complications becomes an urgent task. The proposed model of Type-2 Diabetes Prediction and Classification includes missing value analysis, outliers detection, standardization as a pre-processing task, and a diabetic and non-diabetic class-wise data augmentation module using Adversarial Variational Auto-Encoder (AVAE) with Random Forest Classifier. The experimental results are evaluated and compared with Logistic Regression, Decision Tree Classifier, AdaBoost Classifier, SVC, Random Forest Classifier, GradientBoosting Classifier, and KNeighbors Classifier with cross-validation scores using mean accuracy. The experimental findings using Random Forest Classifier suggest a Type 2 diabetes prediction based on class-wise data augmentation has an accuracy level of 93.09%.

Keywords: Type 2 Diabetes; Data Augmentation; AVAE; Random Forest Classifier; Cross Validation Scores

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Factors Impacting the Adoption of Internet Banking Services Using Technology Acceptance Model with Reference to Women Customers

Ms. Nilamben Johnbhai Parmar[1], Dr Suresh P. Machar[2]

[1]Research Scholar – P. G. Department of Business Studies, Sardar Patel University, V. V. Nagar-388120

[2]Associate Professor – P. G. Department of Business Studies, Sardar Patel University, V. V. Nagar-388120

Abstract

The purpose of this study was to find out factors impacting the adoption of Internet banking services using the Technology Acceptance Model (TAM) with reference to Women Customers. The present study is based on primary data, collected data from women users of Internet banking services in Gujarat, India. 167 women participated in this study, and respondents were chosen using non-probability convenience sampling. Frequency distribution, reliability, validity, and structural equation modelling were carried out. The result found that ease of use, usefulness, and trust have a positive significant relation with the attitude towards the use of Internet banking services. Usefulness, trust, and attitude towards use have a positive significant relation with the intention to use Internet banking services, whereas ease of use has an insignificant relation. The results are expected to have a significant role in the adoption of Internet banking services, particularly among women users and banking sectors.

Keywords: Internet baking services, factors, TAM, Women

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A Review Paper on Image Segmentation and Its Diverse Techniques in Image Processing

Mr. VanshKumar Kanjani[1], Mr. Hirak Modi[2], Mr. Hiren V. Mer[3], Ms. Disha Jain[4], Mr. Harsh Ramwani[5]

[1] Computer Science and Engineering, IITE, Indus University, Ahmedabad, India

[2] Computer Science and Engineering, IITE, Indus University, Ahmedabad, India

[3] Computer Science and Engineering, IITE, Indus University, Ahmedabad, India

[4] Computer Science and Engineering, IITE, Indus University, Ahmedabad, India

[5] Computer Science and Engineering, IITE, Indus University, Ahmedabad, India

Abstract

Image segmentation is the process of breaking down an image into various segments, each consisting of individual pixels. This technique aims to present the image in a more comprehensible manner and is primarily employed to identify objects, delineate boundaries, and extract pertinent information from digital images. Various methods, such as thresholding, clustering, and transformation techniques, can be utilized to carry out segmentation. These methods result in a segmented image composed of pixels, where each pixel encapsulates specific image attributes like color and texture.

Keywords: MIA, Fuzzy, Thresholding, Image Segmentation, Clustering, Sobel, and Prewitt.

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Exploring the Landscape of Open Source Large Language Models

Kalp Shah[1], Prof. Chetan Jayswal[2], Pankit Brahmkhatri[3], Krima Shah[4]

[1] Electronics Engineering, Birla Vishvakarma Mahavidyalaya, Anand, India

[2] Electronics Engineering, Birla Vishvakarma Mahavidyalaya, Anand, India

[3] Info. & Comm. Technology, Adani University, Ahmedabad, India

[4] Computer Engineering, CSPIT-Charusat University, Changa, Anand, India

Abstract

A major advancement in the field of Natural Language Processing (NLP) is Large Language Models (LLMs). These models, like GPT-3, have completely changed how computers interpret and produce human language. Because they have been trained on enormous datasets, they are capable of handling a variety of language-related tasks, including as sentiment analysis, question answering, and text generation and translation. The revolutionary effects of LLMs on a range of sectors, such as healthcare, education, customer service, and content development, are examined in this abstract. It covers the possible advantages and disadvantages of its use, current research and development in this quickly developing sector, and ethical issues surrounding it. With the introduction of LLMs, NLP has expanded and is on the verge of a paradigm shift in how people engage with information and technology.

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Prediction of Heart Failure using machine learning algorithms

Dhruval Patel[1], Gupta Badal[2], Mr. Hiren Mer[3], Mrs.Vaidehi Patel[4], Vishal Polara[5]

[1,2] Computer Science Department, Indus University, Ahmedabad, Gujarat,

[3] Assistant Professor, Computer Science Department, Indus University, Ahmedabad, Gujarat

[4] Assistant Professor, Indus University, Ahmedabad, Gujarat

[5] Assistant Professor, BVM Engineering College, Anand, Gujarat

Abstract

This research is dedicated to the development of a precise predictive model designed to assess the risk of heart failure in hospitalized patients using exclusively supervised machine learning algorithms. It places special emphasis on patient-specific parameters, including age, gender, cholesterol levels, resting Electrocardiogram (ECG) results, prior peak performance, and fasting blood sugar levels, as these factors are crucial for accurate predictions. The study's primary objective revolves around determining the most effective normalization technique, specifically comparing Min-Max normalization and Principal Component Analysis (PCA) when applied to the dataset. This exploration leads to the creation of an optimally efficient predictive model. Within the realm of machine learning, this research underscores the significance of supervised learning in training models with labelled datasets to enhance predictive accuracy. It thoroughly investigates Min-Max normalization and PCA, unveiling their respective impacts on model performance and their contributions to enhancing prediction accuracy. Ultimately, the overarching goal is to advance cardiac health diagnostics by identifying the most suitable normalization technique to prepare input data for model training effectively. This research offers valuable insights into the most effective approach for employing supervised machine learning algorithms in predicting heart failure risks with precision. The outcomes hold significant promise for healthcare practitioners, equipping them with a robust tool for early risk assessment and enabling proactive interventions and personalized patient care in the realm of cardiovascular health. By comprehensively evaluating and comparing normalization techniques in the context of supervised learning, this research enriches the ongoing dialogue surrounding the use of machine learning for improved cardiac health prognosis.

Keywords: Dataset, machine learning, supervised learning, Features, Labels, Correlation, Models, Decision Tree, Random Forest, Logistic Regression, KNN, Support Vector Machine, accuracy, recall, precision score, f1 score, train test split, plots, graphs, cardiac arrest, sample, population, classification, plots, visualization, data analysis

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Quality Evaluation of Voice Signal Based on QMF & Source Filter Model Using MATLAB-Simulink

Rajnikant Rathod[1], Dr. Mehfuza Holia[2]

[1]Assistant Professor, L.E. College of Engineering, Morbi

[2]Assistant Professor, Birla Vishvakarma Mahavidhyalaya Engineering College

Abstract

Voice-coding has been foremost problem in the vicinity of next generation modern wireless communication and digital audio as well as voice processing. voice-coding is the art of renovating the voice signal in a more dense form, which can be broadcasted with a small numbers of binary digits. Linear Predictive Coding (LP) is an extensively utilized technique in audio as well as Voice signal processing. It has create particular use in voice-signal Compression, allowing for very high density rate. This Paper expose the novel approach based on QMF and Source filter Model where QMF filter employed to break up the wideband speech into LF & HF part and processing it individually so that without wideband (WB) coder at source side the near perfect original WB voice has been recovered. Subsequently obtained voice signal can be further processed through source filter model for evaluating signal based on voice quality. From the obtained voice signal at the time varying synthesis filter it can be concluded that source filter model can requires fewer number of bits compared to whole original voice signal transmission at the cost of degradation in voice quality. One can notify the significant changes in original voice quality by observing the spectrogram of voice signal. Less number of bit representation can help in reducing the storage requirement and bandwidth (BW).

Keywords: Quadrature Mirror Filter, Wideband, Public switched telephone systems, reflection co-efficient.

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Recent advancement and challenges in the intergration of MANET for 5G technologies

Vishal Polara[1], Dr. Jagdish Rathod[2], Dr. Keyur Brahmbhatt[2], Dr. Kaushika Patel[4]

[1] Research Scholar, Gujarat Technological University, Ahmedabad

[2] Professor, Electronics Department, BVM Engineering College

[3] Associate Professor, IT Department, BVM Engineering College

[4] Assistant Professor, Electronics Department, BVM Engineering College

Abstract

The integration of Mobile Ad Hoc Networks (MANETs) into 5G networks to fulfill the specific communication demands of mobile devices in highly dynamic circumstances. MANETs are typically employed in emergency, military, and vehicular communication systems because of their self-organizing, infrastructure-free nature. We can improve the network's adaptability, scalability, and resilience by integrating MANET capabilities into 5G, making it ideal for a variety of applications. We highlight the advantages of this integration, including increased communication in scenarios with quickly changing network topologies, better coverage in remote and disasteraffected areas, and lower infrastructure costs. Additionally, we look at practical applications of MANETs in 5G, such as installations for smart transportation systems, the Internet of Things (IoT), and disaster response. We also talk about the difficulties and potential negative effects of this integration, like the complicated network administration and security issues. In conclusion, integrating MANETs into 5G networks is a promising way to increase the capabilities and reach of 5G technology.

Keywords: MANET, Routing Protocol, 5G, IoT

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PCOS Detection Using Machine Learning Algorithms

Diya Gandhi[1], Bansri Patel[2], Dr. Namrata Dave[3]

[1,2,3] G H Patel College of Engineering and Technology, CVM University, Anand, Gujarat

Abstract

Polycystic Ovary Syndrome (PCOS), is a hormonal disorder that occurs among women in their reproductive age. It has effective conflicts throughout this gynecological disorder, as it affects one in ten women at an early age. There are certain symptoms such as irregular menstrual cycles, missed periods, heavy bleeding during the menstruation period, excess of androgen hormones, obesity, acne or oily skin, hair growth on the face, and a typical weight gain. The exact cause of PCOS is not yet properly defined, but it could involve genetic causes and an imbalance in the diet. Due to certain effectiveness like the risk of heart attack, and type two diabetes, it is necessary to get detected and diagnosed as early as possible and start the possible treatments which include a healthy diet and exercises, with medications like birth control pills that control the level of hormones. Certain Machine Learning algorithms are used to detect this disorder. The data set consists of 541 patients, and out of 44 features, 10 potential features were identified using the filter method. This paper includes a detection model of PCOS using various machine learning algorithms like Random Forest, Logistic Regression, Support Vector Classifier, and Decision Tree. Among all these algorithms, Random Forest has 83.48% accuracy for the model.

Keywords: Polycystic Ovary Syndrome, Machine Learning, Random Forest, Logistic Regression, Support Vector Classifier, Decision Tree.

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Review on Blind Image Steganalysis Using DCT

Dharmesh B. Patel[1], Dr. Keyur Bhrambhatt[2], Dipika Kothariya[3], Vishal Polara[4], Dr.Nilesh Prajapati[5]

[1] Assistant Professor, Department of Information Technology. BVM, VVNagar, Anand, Gujarat, India

[2] Associate Professor, Information Technology, BVM, VVNagar, Anand, Gujarat, India

[3] Assistant Professor, Information Technology, BVM, VVNagar, Anand, Gujarat, India

[4] Assistant Professor, Information Technology, BVM, VVNagar, Anand, Gujarat, India

[5] Associate Professor, Information Technology, BVM, VVNagar, Anand, Gujarat, India

Abstract

JPEG images are mostly use in day to day life for conveyance. Patron can be use the number of cryptography techniques for defend important data. Such kind of conveyance can be done using the Steganog-raphy techniques. Steganalysis is one of the best method to hide the important information using Steganogra-phy techniques. Steganalysis is also use to analyse and restructure the valuable information. The different re-modelled area supported by the DCT, DWT and DFT can be classified by Steganalysis. In this paper we can discuss about the different method and techniques of steganography and steganalysis like extraction method, feature selection method and classifier method. Base on this study we can conclude that feature extraction using DCT and DFT gives the better results compare to other techniques.

Keywords: Steganography, Steganalysis, Cryptography, Cover-Image, Stego- Image, Classifier, DFT, DCT, DWT

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Navigating the Educational Landscape: Understanding the Post-COVID-19 Effects on Education

Prof.Dipika Kothariya[1], Dr. K. N. Brahmbhatt[2], Prof. Dharmesh B. Patel[3], Prof. Vishal Polara[4], Prof.Dharmesh G.Patel[5]

[1] Assistant Professor, Information Technology, BVM, VVNagar, Anand, Gujarat, India
[2] Associate Professor, Information Technology, BVM, VVNagar, Anand, Gujarat, India
[3] Assistant Professor, Information Technology, BVM, VVNagar, Anand, Gujarat, India
[4] Assistant Professor, Information Technology, BVM, VVNagar, Anand, Gujarat, India
[5] Assistant Professor, Information Technology, BVM, VVNagar, Anand, Gujarat, India

Abstract

The COVID-19 pandemic disrupted education systems worldwide, ushering in a new era of uncertainty and adaptation. "Navigating the Educational Landscape: Understanding the Post-COVID-19 Effects on Education" explores the multifaceted impact of the pandemic on education, focusing on the challenges faced by students, educators, and educational institutions. This research paper investigates the repercussions of the abrupt shift to remote learning, the widening digital divide, the mental health and well-being of students, the academic performance setbacks, and the exacerbation of educational inequities. Additionally, the paper examines mitigation strategies and interventions employed to address the challenges posed by the pandemic, encompassing educational policies, technology integration, mental health support, and efforts to close learning gaps. Looking ahead, the research paper outlines future directions for education in the post-COVID-19 era, including the long-term effects and implications, innovations in education, and policy recommendations. By delving into the complexities of this unprecedented educational disruption, this paper aims to contribute to informed decision-making and strategies that can help shape a more resilient and equitable educational landscape in the aftermath of the pandemic.

Keywords: COVID-19, pandemic, navigating.

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Effect of Anionic Surfactant (SDS) on Rheological Behaviour of Natural Polymer Guar Gum

Prajapati Prajalben Shantilal[1], Nirav J Bhavsar[2], Dr.Atindra Shukla[3]

[1]PG Scholar, Department of Chemical Engineering, Dharmsinh Desai University, Nadiad
[2]Assistant Professor, Department of Chemical Engineering, Dharmsinh Desai University, Nadiad
[3]Associate Professor, Department of Chemical Engineering, Dharmsinh Desai University, Nadiad

Abstract

This paper presents the impact of anionic surfactant, sodium dodecyl sulphate (SDS), on the rheological behavior of aqueous solutions containing the natural polymer, guar gum. Through systematic variation in guar gum concentrations, we observed significant alteration in viscosity, flow behavior and shear thinning properties of guar gum solutions, using a MCR 102 series rheometer. The findings from this research provide valuable insights into the interaction between surfactants and natural polymers, with implications for enhanced applications in industries where thickening/thinning agents are utilized.

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Potability Testing of Drinking Water from Trains on Konkan Railway Route

Anupkumar J. Rai[1], Dr. Dilecta D'Costa[2]
[1,2] Government College of Arts, Science and Commerce, Khandola, Goa.

Abstract

The availability of drinking water is one of the primary passenger amenities provided by the railways. The present study was undertaken to investigate and evaluate the water quality of the trains plying on the Konkan railway route. The Physicochemical and microbiological studies were carried out to determine the potability of water supplied by railways. The isolation and phenotypic characterization of various pathogens were mainly emphasized. All the analyzed samples showed the presence of coliforms and other organisms indicative of fecal contamination. Seasonal analysis of microbial load indicated that monsoon favours the growth and flourishment of microbes. The biochemical assessment showed the presence of several pathogens like E. coli, Salmonella spp., Vibrio spp., and Clostridium spp. This is a matter of public health concern to train commuters which necessitates better sanitary measures.

Keywords: Water quality; Potability Testing; Train Water; Waterborne Disease.

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Early and Automated Identification of Dysgraphia using Deep Convolution Neural Networks

Sonal Jain[1], Medha Chippa[2], Priti Sajja[3], Basant Agarwal[4], Prateek Sharma[5]
[1,3] Sardar Patel University, [4] Central University of Rajasthan, [2,5] IIIT Kota

Abstract

Learning Disabilities (LD) account for a significant fraction of functional disabilities impacting the world's population. Dysgraphia is a learning disability that manifests as a condition that results in impaired handwriting often interfering with an individual's ability to spell words and affecting their writing speed. The early signs of a Learning Disability can often be spotted in children as young as 6 years. The detection of Learning Disabilities is time-consuming and taxing for the child. This calls for a quick and automated method through which the early signs of a learning disability can be identified and then further referred to a specialist accordingly. Deep Learning and machine learning approaches present a solution to the automatic dysgraphia detection task. The methodologies employed for a learning task are governed by the nature and the modality of the data at hand. Through this work, we propose a Convolution Neural Network (CNN) model to carry out the early and automated detection of dysgraphia.

Keywords: Learning Disabilities, Dysgraphia, Deep Learning, Convolution Neural Networks.

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Crowd Anomaly Detection - Data and Methods

Kinjal V Joshi[1], Maulika S Patel[2]
[1,2] Computer Engineering department, GCET, CVMU, India

Abstract

Crowd Anomaly detection is to analyze the surveillance scene in real time to identify anomalies in a crowd of people. If an anomaly is found, the relevant authorities are immediately alerted. It is very substantial because of more consciousness about security of people and private/public properties. Because of usefulness and complexity, currently, it is an open research area. Automatic anomaly detection is a challenging task because the definition of anomaly is subjective. A normal event in one situation can be considered an abnormal event in another case. In the surveillance video with a dense crowd, automatic anomaly detection becomes very difficult because of clutter and severe occlusion. This manuscript represents the review of the work done in this field.

Keywords: Abnormal event detection, Surveillance scene, Deep learning

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Evaluating Flood Risk in the Panam River Basin: A Comprehensive HEC-RAS Simulation for HydraulicAnalysis

Monal Patel[1], Dr. Falguni Parekh[2]
[1]PhD Research Scholar, Water Resources Engineering and Management, Institute, Faculty of Technology & Engineering, The Maharaja Sayajirao University of Baroda, India – 390002
[2]Associate Professor, Water Resources Engineering and Management, Institute, Faculty of Technology & Engineering, The Maharaja Sayajirao University of Baroda, India – 390002;

Abstract

The use of hydraulic models for flood simulations is a prevalent global practice. In this research, we utilized the HEC-RAS (1D) model to reproduce various flood scenarios in the Panam River Basin, originating from Panam Dam and merging with the Mahi River after a 22 km stretch. Our investigation focuses on computing water surface elevations within the Panam River basin while considering different discharge scenarios. We conducted simulations to produce inundation maps for flood events with return periods of 10, 20, 50, and 100 years and assessed flood-prone areas at various discharge levels. This assessment used time series data from the dam to simulate critical flood situations and their impacts on the Panam River Basin. To achieve this, we developed a study area model using the US Army Corps of Engineers Hydrologic Engineering Center's River Analysis System (HEC-RAS 6.4.1), which included 38 cross-sectional profiles. The HEC-RAS hydraulic model facilitated an evaluation of flood conveyance performance, including calculating non-uniform flow. The model's performance was optimized through a calibration process to replicate water levels at different cross-sections along the river. Our simulation results demonstrate that Manning's roughness coefficient 0.030 provides the most accurate predictions for the Panam River Basin. This research contributes valuable insights into hydraulic modeling for flood risk assessment and management in river basins.

Keywords: Hydraulic modeling; Flood risk assessment; Panam River Basin; HEC-RAS, Inundation mapping; Discharge scenarios; Flood-prone areas; Flood simulation; Hydrologic modeling; River basin management.

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Deep Learning-based Emotional Voice Cloning for Kannada Speech

Kusuma H P[1], Dr. Vanishri Arun[2], Sanchita V Kumar[3], Dr. Manju[4], Dr. S P Shivaprakash[5], Vismaya R[6]

[1] Department of ISE JSS Science and Technology University Mysuru kusumahp124@gmail.com

[2] Department of ISE JSS Science and Technology University Mysuru vanishriarun@sjce.ac.in

[3] Department of ISE JSS Science and Technology University Mysuru sanchitavb16@gmail.com

[4] N Department of ISE JSS Science and Technology University Mysuru manjun007@jssstuniv.in

[5] Department of ISE JSS Science and Technology University Mysuru vismaya.ravi8gmail.com

[6] Department of ISE JSS Science and Technology University Mysuru shivasp@sjce.ac.in

Abstract

Speech synthesis, also referred to as text-to-speech (TTS), is a technology that converts written text into spoken words. Virtual assistants, accessibility tools, navigational systems, and entertainment all use this technology. The development of electronic speech synthesis systems, which reproduce human speech patterns and produce understandable speech, began with mechanical and analogue equipment. Rule-based approaches and statistical parametric models made significant strides in the discipline as a result of improvements in processing capacity. The quality and naturalness of synthesised speech were significantly improved with the introduction of deep learning techniques like recurrent neural networks (RNNs) and convolutional neural networks (CNNs). Modern speech synthesis models now create expressive voices that are lifelike and capture intonation, accent, and emotion. It is a model that converts Kannada text into any speaker's voice based on user-selected emotions, offering enhanced human-computer interaction and accessibility capabilities.

Keywords: TTS, RNN, CNN, SV2TTS, LibriTTS, Encoder, Vocoder, Synthesiser, Mel-spectrogram, Tacotron, WaveRNN

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Literature Review on Multiple Face Recognition based Automated Attendance System using Machine Learning Technique

Ms. Harshidaben R Patel[1], Dr. Monika Patel[2], Dr. Priti Srinivas Sajja[3]

[1] Ph D Research Scholar, CVM University, V V Nagar, Gujarat, India

[2] Assistant Professor, NVPAS, CVM University, Gujarat, India

[3] Director, Post Graduate Department of Computer Science, Sardar Patel University, India.

Abstract

Attendance of the Students is important task in classroom. But student's attendance system is manual at many places. It is time consuming and also requires additional efforts to computerize after manual attendance. Instead of that if we have automated attendance system as face can be unique identification of the person. Such system can help to save time as multiple face recognition can be used for taking attendance of multiple people at a time and decisions can be taken for student using attendance in class. This type of system can be useful at other places like industry, airport, criminal detection, face tracking, forensic, etc. To understand the working of multiple face recognition in educational institute some literatures are studied which elaborated in this paper.

Keywords: Face recognition; Multiple Face recognition; Attendance

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A Correlative Study of Maternal Hemoglobin with Neonatal Birth Weight, Maturity by Age and Apgar Score. Maternal Anemia and Fetal Outcomes

Dr F. N. Shaikh[1], Dr N. Savjiani[2]

Abstract

Background and Objective: Despite many researches being done, maternal anemia yet remains a major problem. Maternal anemia is a threat to mother's health and one of the causes of rise in child morbidity and mortality. This study compares maternal hemoglobin with perinatal outcomes as neonatal birth weight, maturity by age and APGAR score and highlights its effects. Methods: 68 participants each having singleton pregnancy, no comorbidities and no surgical or medical complications were selected for the study. Maternal hemoglobin values were recorded at the time of admission and data of neonatal birth weight, maturity by age and APGAR score were noted at the time of delivery. Through various statistical tests the relationship between maternal hemoglobin and perinatal outcomes were explored. Results: 63.24% participants were found to be anemic. High incidence of low birth weight, preterm babies and no increased incidence of low APGAR score were noted in anemic mothers. However, this study could not establish a significant statistical correlation of maternal hemoglobin with neonatal birth weight, maturity by age and APGR score. Interpretation & Conclusion: The risk of giving birth to low weight and preterm neonates is high in anemic mothers, however the study lacks significant statistical correlation. This study was carried out in a tertiary healthcare center where every mother receives proper antenatal care and thereby reducing the risk of perinatal outcomes associated with low hemoglobin values.

Keywords: APGAR Score, Hemoglobin, Low birth weight, Maternal anemia, Perinatal outcomes, Prematurity, Public health**.**

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A Smart investigation on Intrusion Detection System

Vishwas Sharma[1], Riddhi Mehta[2]
[1,2]Sankalchand Patel University

Abstract

Intrusion Detection System (IDS) is meant to be a software application which monitors the network or system activities and finds if any malicious operations take place. It also keeps an eye on the network and detects any suspicious activity. Internet usage is increasing at an exponential rate, which raises questions regarding how to safeguard digital information. As cybercrime has increased over time, the IDS technology has evolved dramatically. Hackers today employ a variety of techniques to access our computer's personal, secure data. Numerous intrusion detection approaches, tactics, and algorithms will serve as a defence against these threats. The primary objective of this paper is to provide a thorough analysis of the definition of intrusion detection, history, life cycle, and intrusion detection methodologies, types of assaults, various tools and approaches, and implementation issues.

Keywords: Intrusion detection system, IDS attacks, Method, Performance. Life process, Tools.

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Nonlinear Static and Dynamic Analysis of the Elevated Water tank considering Soil Structure Interaction

Vimlesh V. Agrawal[1], Prof. (Dr.) Indrajit N. Patel[2], Jagruti Shah[3]

[1] Research Scholar, Gujarat Technological University, Ahmedabad, Gujarat, India

[2,] Professor, Structural Engineering Department, Birla Vishvakarma Mahavidyalaya, Vallabh Vidyanagar, Gujarat, India,

[3] Assistant Professor, Structural Engineering Department, Birla Vishvakarma Mahavidyalaya, Vallabh Vidyanagar, Gujarat, India,

Abstract

Intrusion Detection System (IDS) is meant to be a software application which monitors the network or system activities and finds if any malicious operations take place. It also keeps an eye on the network and detects any suspicious activity. Internet usage is increasing at an exponential rate, which raises questions regarding how to safeguard digital information. As cybercrime has increased over time, the IDS technology has evolved dramatically. Hackers today employ a variety of techniques to access our computer's personal, secure data. Numerous intrusion detection approaches, tactics, and algorithms will serve as a defence against these threats. The primary objective of this paper is to provide a thorough analysis of the definition of intrusion detection, history, life cycle, and intrusion detection methodologies, types of assaults, various tools and approaches, and implementation issues.

Keywords: Intrusion detection system, IDS attacks, Method, Performance. Life process, Tools.

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Time series analysis of precipitation for Uttarakhand region

Shikha Goswami[1], Alaknanda Ashok[2]

[1] Research Scholar, College of Technology, G. B. Pant University of Agriculture and Technology, Pantnagar, Pincode: 263145

[2] Professor & Dean, College of Technology, G. B. Pant University of Agriculture and Technology, Pantnagar, Pincode: 263145

Abstract

Rainfall in Uttarakhand, is the main cause of the devastating landslides in Uttarakhand, Therefore, efficient rainfall monitoring is essential for managing hazards and evaluating ecosystems. The next-generation satellite mission that delivers global precipitation measurements is called Global Precipitation Measurement (GPM). For the areas of Uttarakhand from Jan 2000 to Dec 2022, we estimated the monthly precipitation using the monthly GPM data that was available and extracted using Google Earth Engine for Uttarakhand region. Time sereis analyis was performed using available models in pycaret libraries. Theta Forecaster resulted with better results as compared to other time series model and reuslted with rmse of 102.2861.

Keywords: Time Series Forecasting, Google Earth Engine, pycaret

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A Comparative Study on Urban and Rural Youth: Exploring Purchase Behaviour of Apparels and Accessories in Vadodara District

Umangi B. Patel[1], Dr. Rekhaba C. Jadeja[2]

[1] Research Scholar, Department of Home Science, Saurastra University, Rajkot, Gujarat, India

[2] Asst. Professor, Department of Home Science, Saurastra University, Rajkot, Gujarat, India

Abstract

This research paper presents a comprehensive comparative study conducted in Vadodara district regarding the influence of information sources and sources of inspiration on shopping attitudes regarding apparel and related accessories. The study categorizes urban and rural youth respondents by gender and area of residence. This study employs structured questionnaire surveys and data analysis tools to uncover insights into the factors that influence apparel and accessory purchases. Understanding the variations in the purchase preferences, motivations, and decision-making processes between urban and rural youth is vital for marketers and policymakers. The results reveal distinct patterns within the male and female categories, shedding light on how individuals gather information about apparel and accessories. In the male category, personal ideas play a pivotal role in sourcing information, followed by input from family members and social media. Surprisingly, radio appears to be the least utilized source of information. Conversely, females rely heavily on family members for information, followed by their own ideas and television. Radio remains the least utilized source in this category as well. The urban-rural divide further explains the data. Rural residents, both male and female, prioritize family members as their primary information source, followed by their personal ideas and friends. Meanwhile, urban residents, irrespective of gender, value their own ideas as the most significant source, closely followed by family members and social media. Radio, in both cases, is the least influential information source. The study also explores the factors inspiring new apparel purchases. Family emerges as the dominant source of inspiration for both males and females, followed by friends and social media trends. In contrast, magazines appear to have the least impact on purchasing decisions. The influence of sex and place of residence on shopping attitudes was further investigated through t-test statistics. The results demonstrate that there are no significant differences in shopping attitudes based on gender as well as place of residence.

Keywords: purchase behaviour, information sources, gender preferences, area of residence

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IoT Based Smart Dustbin

Dhwani Shah[1], Devarshi Patel[2], Sandeep Suthar[3]

[1,2,3]Dharmsinh Desai University

Abstract

Waste management is a worldwide problem faced by humans. Growing population and urbanization lead to exponential growth in waste. The traditional approaches to waste management have not been able to keep up with this, which has resulted in resource depletion, environmental contamination, and health risks. The idea of "Smart Dustbins" has come to light as a potential solution to address these problems and transform waste disposal procedures. This Efficient Waste Disposal or Management System is regarded as critical for Modern Smart Cities that use the Internet of Things (IoT). Our motivation behind this project is also to give our contribution towards the ongoing campaign "SWACHH BHARAT ABHIYAN" (Clean India Movement) initiated by PM of India.

Keywords: waste management; smart dustbin; iot; waste disposal; waste segregation; rain drop sensor; waste tracking

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Enhancing Tribological Performance of HVOF-Sprayed Cr3C2-NiCr Coatings through Nano Yttria-Doped Ceria Reinforcements

Hetal R. Chauhan[1], Ajaykumar Solanki[2], Sahil Variya[3], Sekar Salad[4]

[1] Research Scholar, Gujarat Technological University, Ahmedabad, India

[1,2,4] Sardar Vallabhbhai Patel Institute of Technology,Vasad, India

[3] University of Ottawa, Canada

Abstract

The present study investigates the role of nano yttria doped ceria (YDC) reinforcements in improving tribological properties of Cr3C2-NiCr coatings deposited using high velocity oxy fuel (HVOF) spray process. A novel mixing method containing ultrasonication, magnetic stirring and 3D tumbler mixing was used to uniformly disperse 1 wt. % of YDC nano powders with Cr3C2-NiCr feedstock powders. X-ray diffraction, FE-SEM equipped with EDS mapping were employed to evaluate the phase composition and microstructure of the as-sprayed coatings. The friction and wear behavior of the coatings sliding against Al2O3 ball at room temperature, under unlubricated condition was evaluated with modular ball-on-disc tribometer. The worn surface of the coatings was analyzed by means of scanning electron microscopy and 3D optical profilometer. The friction behavior and wear mechanisms of the coatings with and without YDC were discussed. Results revealed that the composite coatings reinforced with YDC had 12.5% and 29.5% reduction in values of coefficient of friction (CoF) and specific wear rate respectively, compared to the unreinforced Cr3C2-NiCr coating. The enhanced mechanical properties and wear resistance in the composite coatings was credited to the microstructure refinement induced by presence of YDC.

Keywords: HVOF spray, Cr3C2-NiCr coatings, Yttria doped ceria, CoF, Wear

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Women in top positions of PSUs and Top Companies and need for 33% reservation there of

Samidha Banka Agrawal[1], Shruti M. Chhatbar[2]

[1,2] Lecturer, Shri K. J. Polytechnic, Bharuch, India

Abstract

This article explores the underrepresentation of women in top positions within Public Sector Undertakings (PSUs) and leading private companies in India. It delves into the necessity and implications of implementing a 33% reservation for women in these leadership roles. The article examines the current state of gender diversity in corporate leadership, highlights the challenges women face in ascending to top positions, and presents arguments in favor of reservation policies. It also discusses potential benefits, potential opposition, and ways to address reservations' limitations in order to foster greater gender
inclusivity in the corporate world. The article aims to contribute to the ongoing discussion about achieving gender parity in India's corporate sector.

Keywords: Gender Equality, Reservation Bill, Companies, PSUs, Women Empowerment

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Breast Cancer with Special Reference to Candidate Genes and Significant Risk Factors

Ms. Aamena Bharmal[1], Dr. Anjali Kulkarni[2]

[1] Confederation college,1450 Nakina Drive, Thunder bay, Ontario, P7B0E5, Canada

[2] Department of Biotechnology, Genetics and Bioinformatics, N.V Patel College of Pure and Applied Sciences, CVM University, Vallabh Vidyanagar, Anand, Gujarat, India.

Abstract

The most common type of malignancy in today's world which is specifically addressed to women is breast cancer. In 2012, nearly about 1.67 million new cases of breast cancer were recorded worldwide. As life span of population increases in developed countries, the incidence rate of breast cancer among aged senior citizens is seen drastically increasing. In 2017, new 252,710 cases of invasive breast cancer were estimated and, in the USA, 6,341 cases of breast cancer in situ were detected and assessed. Approximately, 24% of all breast cancer cases occur in the Asia-Pacific region, with the highest rates seen in China, Japan, and Indonesia [3]. In India, breast cancer cases had surpassed cancers of the oral cavity and the cervix to be the most common cancer and the leading cause of cancer deaths. In 2018 about 162,468 new cases of breast cancer were established, representing 27.7% of all new cancers among Indian women and 11.1% of all cancer deaths. [11] Bringing awareness about this disease is a challenge in itself. India is a heterogenous country where society is divided into different categories. Reaching out to each group is a task and requires specialized and completely different approaches for creating a word around respectively. Genetic pre-disposition is one of the major factors that contributes in the development of breast cancer. out of all identified genes responsible for breast cancer development, BRCA1 and BRCA2 genes are found to be most susceptible to mutations and causing breast cancer. These two genes orchestrate the vital role incidence of breast cancer. Apart from BRCA genes, other genes such as TP53, STK11, NBN, NF1, ATM and many more listed below in this article. Additionally, the risk factors which have potential to cause breast cancer are further divided into sub-classes which gives a direct idea about how breast cancer can invade apart from hereditary cases. Management of breast cancer is a delicate task. Deciding correct strategy to help the patient is the most important step and it plays an important role in patient's recovery too. Multiple techniques like radiotherapy and more are undertaken with intention to cure the patient. All in all, this review article attempts to summarize all information in a compact and simplified form for better understanding of the reader.

Keywords: Breast cancer, genes, risk factor, management of breast cancer.

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Bioremediation of Congo red using Polyvinyl alcohol - Chitosan Supported Peroxidase as an Efficient and Reusable Catalyst

Neha Bhatkar[1], Aparna Kulkarni[2], Seema Devasthali[3], Varsha Ghadyale[4]

[1,2,3] Department of Chemistry, Gogate Jogalekar College, Ratnagiri, Maharashtra, 415612 India

[4] Department of Biochemistry, Gogate Jogalekar College, Ratnagiri, Maharashtra, 415612 India

Abstract

Peroxidase enzyme, extracted from germinated horse gram (Macrotyloma uniflorum) seedlings was crosslinked on polyvinyl alcohol-chitosan beads using epichlorohydrin. The immobilization method achieved 96% peroxidase immobilization and significant stability. The potential of immobilized peroxidase was investigated for degradation of congo red dye. The immobilized enzyme (26 U) was able to decolorize 100% of 160 mg/L congo red within 10 minutes at 28°C and pH 4. Safety of the dye degradation process was assessed by phytotoxicity and microbial growth study. The immobilized peroxidase could be recycled for eight runs and can be potentially used for bioremediation of congo red dye effluent.

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[1] Confederation college,1450 Nakina Drive, Thunder bay, Ontario, P7B0E5, Canada

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Abstract

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Keywords: Breast cancer, genes, risk factor, management of breast cancer.

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Neha Bhatkar[1], Aparna Kulkarni[2], Seema Devasthali[3], Varsha Ghadyale[4]

[1,2,3] Department of Chemistry, Gogate Jogalekar College, Ratnagiri, Maharashtra, 415612 India

[4] Department of Biochemistry, Gogate Jogalekar College, Ratnagiri, Maharashtra, 415612 India

Abstract

Peroxidase enzyme, extracted from germinated horse gram (Macrotyloma uniflorum) seedlings was crosslinked on polyvinyl alcohol-chitosan beads using epichlorohydrin. The immobilization method achieved 96% peroxidase immobilization and significant stability. The potential of immobilized peroxidase was investigated for degradation of congo red dye. The immobilized enzyme (26 U) was able to decolorize 100% of 160 mg/L congo red within 10 minutes at 28°C and pH 4. Safety of the dye degradation process was assessed by phytotoxicity and microbial growth study. The immobilized peroxidase could be recycled for eight runs and can be potentially used for bioremediation of congo red dye effluent.

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Effective Remediation of Crystal Violet Dye using $CoFe_2O_4$/ Eggshell nanocomposite – H_2O_2

Shruti Waghadhare[1], Aparna Kulkarni[2], Umesh Sankpal[3], Neha Bhatkar[4], Seema Devasthali[5]

[1,2,3,4,5] Department of Chemistry, Gogate Jogalekar College (Autonomous), Ratnagiri, Maharashtra, 415612 India

Abstract

The degradation of Crystal Violet dye, a common pollutant, presents a significant environmental challenge due to its persistence in water bodies. To address this issue, the utilization of magnetically separable catalysts has emerged as a promising solution. In this study, we present a novel approach for the degradation of Crystal Violet (CV) dye using a magnetically separable $CoFe_2O4$/Eggshell nanocomposite and H_2O_2. The $CoFe_2O_4$/Eggshell nanocomposite was synthesized and characterized using various techniques like FT-IR, SEM, EDS and XRD to confirm its structural and compositional properties. The catalytic potential of the nanocomposite in combination with hydrogen peroxide was studied for efficient removal and degradation of CV dye from water. The catalyst presents the advantage of easy recovery through the application of an external magnet and can be effectively reused up to 6 cycles in dye removal processes. This novel combination of magnetically separable nanocomposite and hydrogen peroxide holds promise for catalytic applications in CV dye degradation processes.

Keywords: $CoFe_2O_4$/Eggshell nanocomposite, magnetically separable, Crystal violet dye degradation

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Pandemic Predictor Pro using Machine Learning Algorithms

Deepali K. Gaikwad[1], Ashok Gaikwad[2]

[1] Dept. of Computer Science & IT, Dr, Babasaheb Ambedkar Marathwada University, Aurangabad,(MH), India

[2] Institute of Management Studies & Information Technologies, Vivekanand College Campus, Samarth Nagar, Aurangabad,(MH), India

Abstract

Technology advancement affects all element of life, whether it is in the medical field or any other profession. Artificial intelligence has shown promising results in the area of healthcare by using data analysis and processing to guide its decisions. The most important step in stopping the growth and spread of a life-threatening illness is early detection. The coronavirus, which spreads fast from one person to another, is infecting more and more people. The medical community now has legitimate reasons to be concerned about the COVID-19 pandemic due to its rapid global spread, necessitating the development of an infection detection system. With the development of technology, we now have access to a multitude of COVID-19-related data that can be used to uncover important information about the infection. The approach with the highest accuracy was chosen for the model's final testing after we analyzed the COVID-19 prediction accuracy of various machine learning techniques.

Keywords: COVID-19, COVID-19 related symptoms, Logistic Regression, Decision Tree, Random Forest.

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On the Suitability of Two Different Pulses for UWB Indoor Localization

Sujata Mohanty[1], Aruna Tripathy[2]

[1] Department of ETC, BPUT, Rourkela-769015, Odisha, India

[2] Department of E & I, OUTR, Bhubaneswar- 751029, Odisha, India

Abstract

Indoor localization system (ILS) is the method of finding out the position of the object, people, and equipment etc in the indoor area system. The ultra-wideband (UWB) system is a favourable solution for high data rate in wireless communication for the purpose of Localization. The UWB transmission scheme proposed two major approaches that are single band approach and multiband approach. Here in this paper, the two pulses (Gaussian and Rectangular) are taken into consideration for ILS. Both these two received pulses undergo the operation of averaging and correlation with that of the original transmitted signal for getting the time of arrival (TOA) data in order to locate the position of target in the indoor area system.

Keywords: ILS, Localization, TOA

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Legal Issues Concerning the Internet of Things: A Comprehensive Analysis and Review

Prachi Raval[1]

[1] Assistant Professor, Department of Computer Application (MCA), Sankalchand Patel College of Engineering, Sankalchand Patel University

Abstract

The Internet of Things (IoT) has rapidly evolved, connecting a multitude of devices and systems to the internet, thereby transforming various aspects of our daily lives and industries. This technology's widespread adoption, however, has given rise to a host of legal challenges and concerns. This research paper aims to provide an in-depth analysis and review of the legal issues surrounding IoT. Through a thorough examination of privacy, security, liability, and regulatory considerations, this paper seeks to shed light on the evolving legal landscape and offers insights into potential solutions.

Keywords: Internet of Things (IoT), Artificial intelligence (AI), Internet of Nano-things (IoNT), Smart Health Sensing System (SHSS), Smart Home System (SHS)

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Seismic Control of Building Using Tuned Mass Damper – A Review

Yashkumar K. Mistry[1], Dr. Vishal A. Arekar[2], Prof. Vishalkumar B. Patel[3], Prof. Pratiti M. Bhatt[4]

[1] PG Scholar, Structural Engineering Department, Birla Vishvakarma Mahavidyalaya Engineering College, V.V. Nagar, India

[2,3,4]Assistant Profeser, Structural Engineering Department, Birla Vishvakarma Mahavidyalaya Engineering College,V.V. Nagar, India

Abstract

Seismic control is a key aspect of providing structural safety and stability in earthquake-prone buildings. TMDs (Tuned Mass Dampers) have developed as an effective passive control device for reducing seismic vibrations and improving structural stability. This research focuses on the seismic control of buildings applying TMDs, specifically their design, placement, and impact on structural performance. The study evaluates the effectiveness of TMDs in minimizing structural responses such as displacements, accelerations, and inter-story drifts during seismic events using analytical and numerical methodologies. Furthermore, the inquiry investigates the effect of TMD factors like as mass, stiffness, and damping on their efficacy in seismic control. The findings provide helpful perspectives into optimizing TMD configurations for improving structural seismic performance and promoting safer built environments.

Keywords: Seismic Control, Building, Tuned Mass Damper(TMD), ETABs

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Active Power Loss Minimization and Voltage Stability Improvement with Optimal Capacitor Placement in RDN

Pankita A Mehta[1], Praghnesh Bhatt[2]

[1] Govenrnment Polytechnic for Girls, Ahmedabad, Gujarat, India

[2] Pandit Deendayal Energy University, Gandhinagar, Gujarat, India

Abstract

The placement of capacitors in radial distribution networks plays a vital role in improving power quality. In the present work, a particle swarm optimization-based approach has been presented to allocate shunt capacitors in radial distribution networks. The objective function is formulated to minimize the active power loss in the system after the optimal placement of capacitors. The standard 33-node and 69-node test systems are considered for the analysis and validation of the results. Case studies are carried out to compare the performance of the distribution network with the placement of single and multiple capacitors. Results show that optimal placement of capacitors with proper sizing can significantly reduce the active/reactive power losses, improve the node voltage profile, and enhance the voltage stability of the distribution network.

Keywords: Active power losses; capacitor placement; radial distribution network; voltage stability.telligence (AI), Internet of Nano-things (IoNT), Smart Health Sensing System (SHSS), Smart Home System (SHS)

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Assessing The LOS of Urban Road in Heterogeneous Traffic and Giving the Mitigation Measure: A Case Study of Vadodara City

Deep R. Damor[1], Ankita Sharma[2], Tejas Pandya[3]

[1,2,3] Transportation Engineering, Parul Institute of Engineering and Technology, Post Limda, Waghodia, Gujarat, India.

Abstract

This comprehensive review focuses on the assessment of the Level of Service (LOS) for Vadodara's urban roads, with a specific emphasis on applying volume-capacity analysis as a crucial tool to address the complex challenges presented by the heterogeneous traffic conditions. The primary objective is to tailor and adapt the existing LOS criteria to align with the distinctive characteristics of Vadodara's urban roads, taking into account the city's diverse traffic composition and traffic behavior. The modified LOS criteria include the consideration of factors such as traffic volume, road capacity, and the varied types of vehicles navigating the city's roadways. This review contributes significantly to the field of urban transportation planning by offering a detailed assessment of Vadodara's urban road network and addressing the critical issue of LOS under the influence of heterogeneous traffic patterns.

Keywords: Congestion, Urbanization, Level of Service (LOS), Free Flow Speed (FFS), Passenger Car Equivalent (PCE), Volume – Capacity Relationship, Mitigation Measures.

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A Study on Public Bicycle Sharing (PBS) System

Shrutik A. Chaudhari[1], Rena N. Shukla[2], Dr. Samir J. Patel[3]

[1] P.G. Student, Civil Engineering Department, L.D. College of Engineering, Ahmedabad, India.

[2] Associate Professor, Civil Engineering Department, L.D. College of Engineering, Ahmedabad, India.

[3] Assistant Professor, Indus University, Ahmedabad

Abstract

With the ever-increasing population and increase in the standard of living of the people, they are more drawn towards having their personal vehicles. This has resulted in a significant increase in the density of vehicles on the roads which increases the traffic congestion problems as well as parking problems and also environmental problems like air pollution, global warming. Seeing the current scenario, there is a need for the people to shift from private to the public mode of transport. Many developed and developing countries are trying to attract people to use public transport more and more so that the above problems can be solved at some level. The Public Bicycle Sharing (PBS) system is the trending green mode of transport which is more economical compared to other modes of transport. Despite the failure of the first generation, the PBS system has become popular through customized bicycles, economical prices, and facilitated docking stations of the second, third, and fourth generation. This is a review-based paper that mainly focuses on the study of past researches that have been done by using different models and methods to plan the Public Bicycle Sharing (PBS) system by determining the location of the docking stations, the number of docking stations, and bicycles required, the capacity of the docking stations, and demand at each docking station through analysis of the collected information of data like demographics, socioeconomic characteristics and commuter's travel behavior. The appropriate planning and implementation of the PBS system can bring sustainability to the public transportation system and more usage of PBS can solve the issues like traffic congestion, parking problems, air pollution at some level.

Keywords: Bicycle, Capacity of the docking station, Docking station, Location of the docking station, Public Bicycle Sharing (PBS)

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Travel in cities: Inclusivity and Complexity for Women

Rena Shukla[1], Nishant Prajapati[2], Khooshi Bhatt[3], Pratik Gamara[4]

[1] Associate Professor, Civil Engineering Department, L.D. College of Engineering, Ahmedabad, Gujarat, India

[2,3,4] First year M.E. Students, Civil Engineering Department, L.D. College of Engineering, Ahmedabad, Gujarat, India

Abstract

Over the past few decades, transportation has advanced significantly, and at the same time, the conversation around gender-based transportation demand has intensified. Women's mobility requirements have been getting more attention as more women are employed and working outside the home. Furthermore, females and males have been shown to have different travel patterns in developing nations, necessitating independent research. With this perspective, the goal of study is to examine the complexity faced by women during life span. As they transition from childhood to adulthood to motherhood and so while traveling in cities. The exclusive policies offered by policy makers to women are not enough and rather inclusivity of women in policies are expected. The responders are women of different age groups and different income group possessing different occupation and making their daily trips with either public transport or private mode. The study explored factors which contribute to problems faced by respondents and their travel experience for their respective mode. The parameters such as travel cost, waiting time, comfort and convenience for each respondent is included in data analysis. In urban area pollution and congestion like problems are common. Working women with take care of family members and household work runs all the time with stress and hurry. Home maker women has also number of trips now a days. Women moves with 2w along with children, school bags and household goods are sometimes on risk in case of open vehicle. Women are less habitual about their health and safety and not wearing helmet. Illiterate, aged and disabled have more challenges to cope up with existing scenario of travel in cities. Pregnant women and women holding babies in hands are finding great difficulties to travel in cities. This paper focuses on inclusivity and complexity of women in urban area for travel in cities.

Keywords: Complexity, Exclusivity, Travel, Women

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Early Detection of Ovarian Cancer Using Artificial Intelligence: A Review

Sukeshini Jadhav[1]

[1] Government College of Engineering Aurangabad.

Abstract

The most common type of cancer detected in women is ovarian cancer. According to data from previous research, for elderly women, ovarian cancer is a dangerous illness. It is the fifth most common disease worldwide and the seventh most significant cause of mortality in women. The predictive precision of AI has improved over that of conventional algorithms. However, further research is needed to contrast the impact of different artificial intelligence methods and variables and to suggest survival recommendations. This article first describes the process for choosing the studies, after which it provides a summary of ovarian cancer and different techniques for gathering data. and evaluation using machine learning approaches this work also provides a comprehensive exploration of the malignant and benign datasets and summarizes ML-based classification. Ovarian cancer remains a silent and deadly disease, often diagnosed at advanced stages, resulting in reduced survival rates and increased treatment complexity. Early detection of ovarian cancer is critical for improving patient outcomes. This study presents an innovative approach leveraging Artificial Intelligence (AI) techniques for the early detection of ovarian cancer. It also provides an overall visualization of the performance achieved and how it is useful for early detection based on the reviewed papers. Finally, potential directions and current challenges are considered.

Keywords: Ovarian cancer, artificial intelligence, AI technique, Dataset, Biomarker ultrasonography, ovarian cyst, AI challenge

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Dental Carries Detection using Convolutional Neural Network: A Review

Rutuja Kale[1]

[1] Government College of Engineering, Chhatrapati Sambhajinagar

Abstract

Dental caries is a common chronic disease worldwide, also called as tooth decay. It is caused by bacteria and poor dental hygiene, leading to tooth loss. Sometimes, cavities can be stopped without detection, but if left untreated, the infection can spread to the teeth's inner tissues or infected with one another. Without early and appropriate care, the infection can spread to soft tissues in the cheek, jawbone, or other areas of the head and neck. Although not life-threatening, dental caries increase the risk of infection, breathing restriction, and odontogenic infections. Early detection and treatment are crucial to prevent complications and reduce the need for invasive procedures. Therefore, accurate and timely identification of dental caries development is essential for effective prevention and treatment. This Paper attempts to diagnose dental cavities early on using CNN so that treatment may be conducted conveniently and successfully.

Keywords: Dental caries, Artificial neural network (ANN), Soft Computing techniques, Convolution Neural Network (CNN).

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Implementation of Kaizen Methodology for Reducing Defects in Industries

Bhakti Patel[1], **Veena Lalvani**[2], **Jigisha Thakkar**[3]

[1,2] Undergraduate Student, Department of Production Enginnering, Birla Vishvakarma Mahavidyalaya, Vallabh Vidhyanagar, 388120

[3] Assistant Professor, Department of Production Enginnering, Birla Vishvakarma Mahavidyalaya, Vallabh Vidhyanagar, 388120

Abstract

This research paper outlines a structural approach to implementing Kaizen principles in manufacturing for defect reduction. It breaks down Kaizen into three parts: Strategic Kaizen, Value Stream Kaizen, and Daily Kaizen. The methodology covers data collection and analysis, Pareto analysis, root-cause analysis. Idea generation is faciliated through brainstorming sessions, and solutions are prioritized using a Solution Prioritization Matrix. The paper emphasizes result observation and comparision to initial targets for continous improvement.

Keywords: Kaizen, defect reduction, manufacturing, process improvement, implmentation, root-cause analysis, Pareto analysis, continous improvement.

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Lead Time Reduction in Worm Shaft Manufacturing Process by Using Lean Tools

Manas Rathod[1], Veena Lalvani[2], Jigisha Thakkar[3]

[1,2] Undergraduate Student, Department of Production Enginnering, Birla Vishvakarma Mahavidyalaya, Vallabh Vidhyanagar, 388120

[3] Assistant Professor, Department of Production Enginnering, Birla Vishvakarma Mahavidyalaya, Vallabh Vidhyanagar, 388120

Abstract

Reducing lead time in manufacturing is essential to meet customer demands, increase productivity, and stay competitive in the industry. This work investigates the challenges faced by a worm shaft manufacturing cell with increased lead time due to different operations being performed in different departments. The study proposes lean tools to reduce lead time and increase efficiency. The paper discusses the implementation of value stream mapping, work standardization and continuous improvement to streamline the manufacturing process and eliminate waste. The study evaluates the impact of these lean tools on lead time reduction and productivity improvement in the worm shaft manufacturing cell. The results suggest that lean tools can significantly reduce lead time by improving process flow, reducing transportation, and eliminating non-value-added activities. Furthermore, the study highlights the potential benefits of lean tools, such as improved quality, increased flexibility, and reduced manufacturing costs. In conclusion, the application of lean tools is an effective approach to reducing lead time in worm shaft manufacturing, and organizations can achieve significant improvements by implementing them.

Keywords: lead time; Productivity; Worm shaft manufacturing; Lean tools; Value stream mapping; Work standardization; Eliminating waste; Non-value-added activities.

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Captioning The Visual World: A Survey of Image-To-Text Approaches

Yash Sindha[1], Duttresh Sapra[2], Tilak kundaliya[3], Dr. Keyur N. Brahmbhatt[4], Prof. Dipika Kothariya[5]

1 Student at IT Department, BVM Engineering College, V.V. Nagar, India

2 Student at IT Department, BVM Engineering College, V.V. Nagar, India

3 Student at IT Department, BVM Engineering College, V.V. Nagar, India

4 Head of IT Department, BVM Engineering College, V.V. Nagar, India

5 Asst.Prof. at IT Department, BVM Engineering College, V.V. Nagar, India

Abstract

This article provides essential strategies and insights to enhance the accuracy of image recognition models. While building and training deep learning models for image recognition, it's not uncommon to encounter accuracy levels between 50% and 70%. This article offers six practical "hacks" to elevate the performance metrics of your image recognition models. To address the challenge of image caption accuracy for images outside the initial dataset, we propose an innovative approach. This involves introducing an additional dataset with 100 distinct-category images. By retraining the model with this dataset and fine-tuning, we aim to enhance caption accuracy, especially for images beyond the original dataset.

Keywords: Image captioning, Machine Learning

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Enhancing OSINT Practices with Eye-Sint: A Multi-Module Intelligence Tool

Sneh Bavarva[1], Kalpesh Senva[2], Kashish Datta[3], Prof. Priyank Bhojak[4]

[1,2,3] Student at Birla Vishvakarma Mahavidyalaya, V. V. Nagar, Gujarat.

[4] Assistant Professor at Birla Vishvakarma Mahavidyalaya, V. V. Nagar, Gujarat.

Abstract

Modern intelligence and cybersecurity heavily rely on open-source intelligence (OSINT). This paper introduces the unique "Eye-Sint" OSINT tool, designed to revolutionize information acquisition for intelligence analysts and cybersecurity specialists. Eye-Sint combines port scanning, web scraping, and human footprinting. Its web scraping module can collect website headers, performs whois lookups, extracts emails, and many more things. The person footprinting module identifies individuals and extracts data from PDFs and domains. The port scanning module detects open ports for security assessments. We presented a detailed architecture, methodology, and capabilities. Real-world use cases highlight its importance in digital analysis, cybersecurity, and intelligence. We compare Eye-Sint with other OSINT tools, emphasizing its qualities and ethical data collection. This study highlights Eye-Sint's precision, reliability, and its role in improving OSINT in cybersecurity and intelligence.

Keywords: Open-source intelligence (OSINT), Web scraping, Person footprinting, Port scanning, SSL, Whois, Metadata analysis, Web crawl, Email finder, Domain search

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Analysis of Healthcare 4.0: Shaping the Future of Healthcare

Deep Patel[1], Dhrumil Gajera[2], Vishva Gajera[3], Prof. Chetan Jayswal[4]

[1,2] Electronics Engineering, Birla Vishvakarma Mahavidyalaya, Anand, India

[3] HSC (B - Group) Ashadeep Science Bhavan, Surat, India

[4] Electronics Engineering, Birla Vishvakarma Mahavidyalaya, Anand, India

Abstract

From industrial automation to space program, Industry 4.0 has revolutionized a number of industries. One of its main beneficiaries has also been healthcare. Industry 4.0 utilizes cutting-edge technologies like Artificial Intelligence (AI), Machine Learning, Big Data, Cloud Computing, Blockchain, and IoT to deliver solutions that are efficient, accurate, and timely. The healthcare revolution is a laborious task that necessitates careful consideration of many technological and medical issues. In this essay, we'll talk about how modern technologies can bring about unimaginable change in the health sector, how to use them effectively, and what the biggest obstacles are to doing so.

Keywords: Healthcare, Industry 4.0, Humanity, AI.

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Synergistic Fusion of VAEs and GANs for Addressing Data Scarcity in Medical Image Generation

Kashish Datta[1], Duttresh Sapra[2], Aadityasinh Jadeja[3], Dr. Zankhana Shah[4]
[1,2,3] Student at Birla Vishvakarma Mahavidyalaya, V. V. Nagar, Gujarat.
[4] Assistant Professor at Birla Vishvakarma Mahavidyalaya, V. V. Nagar, Gujarat.

Abstract

The paper suggests an innovative solution for overcoming the difficulty of obtaining extensive medical datasets due to strict privacy regulations. It introduces VAE-GAN (VGAN), a fusion of Variational Autoencoders (VAEs) and Generative Adversarial Networks (GANs). VGAN harnesses VAEs to create a structured latent space, improving the sharpness and realism of medical image generation compared to standalone VAEs. The paper covers VGAN's architecture, training methods, and challenges tied to limited medical data. Evaluation metrics like Fréchet Inception Distance (FID) and Inception Score (IS) illustrate VGAN's image quality and diversity. VAEs play a pivotal role in achieving faster and more stable model convergence, effectively addressing data scarcity in medical research while upholding privacy regulations. VGAN emerges as an innovative solution for generating medical data, facilitating research, and advancing the medical field within the boundaries of privacy rules.

Keywords: GAN; VAN; FID; Inception Score.

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Behaviour of Twisted Building with Various Structural Configurations- A Review

Anvay S. Patel[1], Prof. Vishal B. Patel[2], Dr. Indrajit N. Patel[3], Prof. Vimlesh V. Agrawal[4], Prof. Pratiti M. Bhatt[5]
[1]PG Scholar, Structural Engineering Department, Birla Vishvakarma Mahavidyalaya Engineering College, Vallabh Vidyanagar, India
[2,4,5] Assistant Professor, Structural Engineering Department, Birla Vishvakarma Mahavidyalaya Engineering College, Vallabh Vidyanagar, India
[3] Professor and Principal, Structural Engineering Department, Birla Vishvakarma Mahavidyalaya Engineering College, Vallabh Vidyanagar, India

Abstract

Tall buildings have a symbolic value in urban environments because they have a significant impact on how city skylines are arranged. Their unique shapes are responsible for the enhancement of aesthetic appeal and have a significant impact; meanwhile, their intricate patterns offer a feeling of variety while also offering architectural challenges. This study's main objective is to undertake a thorough examination of the existing literature in order to fully understand the present state of knowledge about the complex structural characteristics of twisted towers. A major emphasis is placed on assessing the benefits and drawbacks of various structural approaches, which cover adaptive and non-adaptive systems. This paper aims to add a deeper understanding of the complexity of planning twisted towers by methodically compiling and examining the substantial volume of existing literature. It aims to be a broad resource that provides a detailed analysis of the twisted structures.

Keywords: Twisted diagrid, Outrigger, Rate of twist, Twisted building, Adaptive system, Non-adaptive system, Structural systems.

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Analyzing the Effects of Variable Diagrid Angles on Tall Building Performance -A Review

Jay P. Patel[1], Prof.Vishalkumar B. Patel[2], Dr. Indrajit N. Patel[3], Dr. Darshana R. Bhatt[4]

[1] PG Scholar, Structural Engineering Department, Birla Vishvakarma Mahavidyalaya Engineering College, Vallabh Vidyanagar, India

[2]Assistant Proffesor, Structural Engineering Department, Birla Vishvakarma Mahavidyalaya Engineering College, Vallabh Vidyanagar, India

[3] Professor & Principal, Structural Engineering Department, Birla Vishvakarma Mahavidyalaya Engineering College, Vallabh Vidyanagar, India

[4] Head of Department, Structural Engineering Department, Birla Vishvakarma Mahavidyalaya Engineering College, Vallabh Vidyanagar, India

Abstract

Diagrid structures are made up of a diagonally oriented network of crossing components and are renowned for their visual appeal and effectiveness. In order to provide a thorough historical and thematic overview of the development of the diagrid system as well as current developments in design, analysis, and construction approaches, this study undertakes an intensive investigation of relevant literature. This review carefully analyzes case studies and academic research, highlighting important elements including the structural performance of diagrids under varied loads, member dimension optimization, and their integration with sustainable design concepts. It adds to the corpus of existing knowledge by providing insightful information on the field of diagrid structures, which advances our understanding and recognition of their significance.

Keywords: variable angle diagrid, Seismic performance, Lateral displacement, Geometrical optimization, ETABs, STAAD.Pro, Displacement, Storey Drift.

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Seismic Effect of Multi-Tower Connected with Sky Bridge-A Review

Dhodiya Dixika M.[1], Dr.Vishal A. Arekar[2], Prof Vishalkumar B. Patel[3]

[1] PG Research Scholar, Department of Structural Engineering, Birla Vishvakarma Mahavidyalaya Engineering college, Vallabh Vidyanagar, Gujarat, India

[2,3] Assistant professor in Structural Engineering department, Birla Vishvakarma Mahavidyalaya Engineering college, Vallabh Vidyanagar, Gujarat, India

Abstract

Towering structures such as twin towers are a symbol of a radical transformation of urban landscapes. Their avant-garde concepts are highly appealing to engineers and architects, transforming the urban landscape. In addition to being beautiful, these monumental wonders revitalize regional economy and modern metropolitan lifestyles. They provide a blend of imaginative architectural expression and useful urban function, addressing the pressing need for seismic resistance, particularly in earthquake-prone locations. The current study thoroughly examines the nuances of structural behaviour, safety protocols, and mass distribution. Planning and maintaining multi-tower complexes depend heavily on the invaluable knowledge that is produced by the ongoing research. Urban landscapes that are both aesthetically beautiful and long-lasting require this kind of information. There has been a drastic shift in urban areas.

Keywords: Tall Building, Sky bridge, Etabs, Twin tower, Sesmic effect, Cross bracings

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Backstay Effect on Tall Structures with Podium Structure -A Review

Parth G. Rathod[1], Prof. Sumant B. Patel[2], Prof. Pratiti M. Bhatt[3]

[1] PG Research Scholar, Department of Structural Engineering, Birla Vishvakarma Mahavidyalaya, Vallabh Vidyanagar, Gujarat, India

[2] Associate Professor in Structural Engineering department, Birla Vishvakarma Mahavidyalaya, Vallabh Vidyanagar, Gujarat, India

[3] Assistant professor in Structural Engineering department, Birla Vishvakarma Mahavidyalaya, Vallabh Vidyanagar, Gujarat, India

Abstract

Tall buildings have become integral to urban landscapes, addressing the demand for space in densely populated cities worldwide. Designing such structures presents complex challenges, particularly in earthquake-prone areas. Understanding the "Backstay Effect" is pivotal, especially in podium-configured buildings. This effect requires a fresh perspective, incorporating a cantilever analogy with a back span to consider the podium's lateral stiffness, unlike conventional methods that treat shear walls as simple cantilevers. The Backstay Effect involves transferring seismic forces from the tower to the podium, profoundly impacting lateral stability and seismic performance. It relies on floor diaphragms and significantly bolsters safety by countering seismic overturning forces. Mastery of this phenomenon is vital for structural design and earthquake resilience, offering engineers and researchers a unique challenge and an opportunity for innovative design and analysis techniques.

Keywords: Tall structures, Podium, Backstay effect, Seismic performance, Lateral displacement, ETABs.

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An Empowering Women in STEM: Bridging Gaps and Fostering Inclusivity for Sustainable Careers

Dharmesh Patel[1], Kinjal Gandhi[2], Nihali Jain[3], Vishal Polara[4]

[1,4]BVM Engineering College

[2]CHARUSAT University

[3]ITM (SLS) Baroda University

Abstract

In the ever-evolving landscape of science and technology, women have consistently proven their mettle, contributing significantly to innovation, research, and development. However, gender disparities persist in these fields. Historically, women have encountered barriers in pursuing STEM (Science, Technology, Engineering, and Mathematics) careers, including societal expectations, biases, and lack of representation. Despite these challenges, numerous pioneering women scientists and technologists have shattered glass ceilings, inspiring future generations. Initiatives promoting STEM education for girls, scholarships, and mentorship programs are gradually bridging the gender gap. Representation matters. Seeing women in leadership roles within scientific and technological fields provides essential role models for young girls aspiring to pursue careers in these areas. Efforts to highlight the achievements of women scientists and technologists through media, conferences, and awards are essential in challenging stereotypes and encouraging more women to enter these fields. Mentorship programs play a crucial role in nurturing talent. Establishing mentorship initiatives where experienced women scientists guide and support younger professionals can provide invaluable insights, boosting confidence and promoting a sense of belonging. Additionally, creating supportive networks where women can share experiences and advice fosters a sense of community and solidarity.

Keywords: Women in STEM, Gender Equality, Sustainable careers, Inclusive Innovation

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A Comprehensive Survey of Two-Wheeler Security and Monitoring Technologies

Yash Sangale[1], Vivek Chauhan[2], Anita Bhatt[3], Jagdish Rathod[4]
[1,2]Student, [3]Assistant Professor, [4]Associate Professor
[1,2,3,4]BVM Engineering College V.V.Nagar

Abstract

Two-wheeled vehicles have experienced a significant surge in popularity as a preferred mode of global transportation. This increase in popularity can be attributed to their compact design, cost-effectiveness, and minimal maintenance requirements, making them an essential part of our daily lives. They offer a convenient and economical mode of transportation for many individuals. However, this heightened adoption has also resulted in a surge in road accidents due to factors such as excessive speeding and reckless driving practices, alongside a rising incidence of two-wheeler thefts. In response to these challenges, there have been numerous technological advancements aimed at addressing these concerns through two-wheeler security and monitoring systems. These contemporary security systems have proven to be effective solutions, incorporating cutting-edge technologies such as GPS (Global Positioning System), GSM (Global System for Mobile Communications), IoT (Internet of Things), and various sensors. These systems offer diverse feature, including accident detection, theft prevention, real-time tracking, and remote monitoring through SMS, calls, apps, or web interfaces. This review paper dives deep into the diverse landscape of such two-wheeler security and monitoring systems, with the aim of providing a clear and accessible understanding of their features, benefits, limitations, and future prospects.

Keywords: Accident Prevention, GPS, GSM, IoT, Monitoring Systems, Theft Prevention, Two-Wheeler Security.

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IoT Applications in Agriculture

U.B. Gohil[1], Dr. D. M. Patel[2]
[1] Assistant Professor, Dept of Information Technology, Parul Institute of Engineering and Technology, Vadodara, Gujarat-391760
[2] Professor, Electronics and Communication Department, B.V.M. Engineering College, Vallabh Vidyangar, Gujarat-388120

Abstract

India is a country of highest population in the world. To feed these population, the agriculture sector plays an important role. Apart from food security or substantiable agriculture, the climate and the topology of India are challenging for the agriculture sector. Technologies like artificial intelligence, Machine learning, cloud computing and IoT make the process quite easy for farmers as well as the countrymen. This paper shows the IoT applications in Indian agriculture with machine learning and cloud computing. The selected domains are crop health management, irrigation system, and weather information. Also, this paper includes the GIS applications, drone applications, sensor applications in the vast agriculture fields.

Keywords: IoT in agriculture; Sensors; Cloud computing

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A Novel Multiprocessor Scheduling Algorithm for Soft Real-Time System

Dr. Jayna Donga[1], Dr. Vatsal H. Shah[2]
[1]Assistant Professor, MBIT Engineering College, Gujarat
[2] Assistant Professor, BVM Engineering College, Gujarat

Abstract

In the current era many RTOS are implementing their schedulers using processor affinity for hard real-time systems rather than using the conventional approaches which are described into the literature. The processor affinity implementation provides flexibility in migration but the unrestricted migration and random assignment of affinity creates more switching overhead and degrades the cache performance also. At the same time restricted migration is reducing the switching overhead but it will mostly affect the other very significant parameters for the any RTOS. It lowers the performance by increasing the deadline miss ratio and tardiness which are the very essential parameters for any soft real-time system. To find the way between this two problems, the paper presents the hybrid dynamic affinity based scheduling approach for SRTS to reduce the deadline miss ratio, number of context switches, the tardiness and to improve the CPU_Utilization with careful affinity assignment rather than random static affinity assignment. This paper also addresses the priority inversion problem and gives the solution by affinity reassignment.

Keywords: Processor Affinity, RTOS, Tardiness, Multiprocessor system, CPU_Utilization, Dead-line Miss Ratio, context switch, RTS, SRTS

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The behavior of Prefabricated Reinforced Concrete (RC) Structural Elements under Fire: A theoretic review of methodologies and solutions

Jaimin Sureshbhai Parmar[1], Nawal Kishor Banjara[2], Chandan Swaroop Meena[3], Jagruti P. Shah[4]
[1]Research Scholar, Birla Vishvakarma Mahavidyalaya, Anand, India (Corresponding Author)
[2]Principal Scientist, CSIR-Central Building Research Institute, Roorkee, India
[3]Senior Scientist, CSIR- Central Building Research Institute, Roorkee, India
[4]Assistant Professor, Birla Vishvakarma Mahavidyalaya, Anand, India

Abstract

An inevitable fire scenario is a real threat a structure may experience in its entire lifespan. A structure affected and weakened by a severe and uncontrolled fire puts a life-threatening risk to the lives of the occupants, rescue and emergency service staff, and surrounding structures and people. This paper reviews the recent understanding of the behavior of Reinforced Concrete (RC) structural elements having Normal Strength Concrete (NSC) and Normal Strength Steel (NSS), under fire scenarios, the methodologies used to study the behavior, and various solutions present for passive protection of the structure of a modular building (Prefabricated Buildings). Owing to the higher quality, applicability, and practicality of this method, prefabrication provides an approach to the passive protection of large-scale infrastructure buildings.

Keywords: Prefabricated Buildings; Fire conditions; Thermal behavior; RC elements; CFST; FRP; LWAC; PCSP.

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Seismic Behavior of Outrigger System in RC Tall Building - A Review

Tushar J.Kachariya[1], Prof.Vimlesh V. Agrawal[2], Prof.Vishalkumar B.Patel[3], Prof.Pratiti M.Bhatt[4]

[1] PG Scholar, Structural Engineering Department, Birla Vishvakarma Mahavidyalaya Engineering College, Vallabh Vidyanagar, India

[2,3,4] Assistant Professor, Birla Vishvakarma Mahavidyalaya Engineering College, Vallabh Vidyanagar, India

Abstract

The seismic behaviour of outrigger systems in reinforced concrete (RC) tall buildings, which are vital structures in modern urban landscapes. Outrigger systems play a pivotal role in enhancing the structural stability of tall buildings during seismic events, making this an essential subject of study. This paper Interactions between different lateral load resisting systems like outrigger systems, Moment Frame, Braced Frames, Hybrid systems, Base Isolation, and Diagrid systems are analyzed to provide a comprehensive understanding of the seismic behaviour of tall RC buildings. Site-specific conditions and soil-structure interactions are also considered. This paper identifies research gaps and emerging trends, underscoring the need for further work in performance-based design, sustainability, and resilience of outrigger systems. This review is a valuable resource for researchers, practitioners, and industry stakeholders seeking to enhance the seismic resilience of tall buildings.

Keywords: Outrigger system, Tall Building, Response Spectrum method, Time history method, Seismic response

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Survey of indoor environment quality for office building

H. Z. Patel[1], N. D. Sharma[2]

[1] Ph. D - Research scholar, Gujarat Technological University (GTU), Ahmedabad, Gujarat, India

[2] Ph. D - Research Supervisor, Gujarat Technological University (GTU) & Project Manager, En-vision Enviro Technologies Pvt. Ltd. Surat, Gujarat, India

Abstract

The intricate phenomena of indoor air pollution arise from the ever-changing interplay of several indoor and outside environmental elements. This research was conducted in office buildings during pre-monsoon season. Relative humidity and temperature, particulate matter (PM2.5, PM10, PM1), carbon dioxide, formaldehyde and total volatile organic compound (TVOC) were measured throughout each building five days a week, at 30-minute intervals between 9:00 AM and 5:00 PM. Regarding thermal characteristics, the temperature in each building is marginally higher and relative humidity within the limits than the Indian Society of Heating Refrigerating and Air Conditioning Engineers (ISHRAE) standards. Notably, the average concentration of particulate matter, CO2, HCHO and TVOC were recorded and compared with the standards establish by World Health Organization (WHO) and American Society of Heating Refrigerating and Air conditioning Engineers (ASHRAE) with building characteristics.

Keywords: indoor air quality; thermal characteristic; environmental element; office buildings; standards

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Study on Compressive Strength of Plastic Grain Reinforced Piles Using Temperature Sensor- A Review

Kirit R. Prajapati[1], Prof. Pratiti M. Bhatt[2], Prof. Ghansyamkumar B. Rathod[3]

[1] PG Scholar, Structural Engineering Department, Birla Vishvakarma Mahavidyalaya Engineering College, Vallabh Vidyanagar, India

[2] Assistant Professor, Structural Engineering Department, Birla Vishvakarma Mahavidyalaya Engineering College, Vallabh Vidyanagar, India

[3] Assistant Professor, Electronics and Communication Engineering Department, Birla Vishvakarma Mahavidyalaya Engineering College, Vallabh Vidyanagar, India

Abstract

In civil engineering, piles are vital because they give structural support under heavy loads. The benefits of novel reinforcing materials, such as plastic granules, which address plastic waste concerns and improve structural integrity, are becoming more well known. This research employs a methodical approach, carrying out an extensive examination of previous studies. Along with reviewing several approaches, it also highlights important discoveries and suggests fresh approaches to using plastic granules in pile construction. In addition to advancing field knowledge and highlighting the significance of temperature sensitivity in designing and implementing these cutting-edge pile construction methods, the report emphasises the critical role that temperature sensors play in evaluating these novel piles, particularly in a variety of real-world climates.

Keywords: Concrete pile, Plastic grain, Low density polyethylene, High density polyethylene, Polypropylene, Temperature sensor.

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Designing AI Based Non-invasive Method for Automatic Detection of Bovine Mastitis

Lakshitha S L[1], Priti S Sajja[2]

[1] Ph.D Research Scholar, PG Department of Computer Science and Technology, Sardar Patel University, Vallabh Vidyanagar 388 120, Gujarat, India.

[2] Professor and Director. PG Department of Computer Science and Technology, Sardar Patel University, Vallabh Vidyanagar 388 120, Gujarat, India.

Abstract

Mastitis is a major disease in dairy animals due to udder inflammation. The occurrence of disease impacts the economic status of the farmer and hinders the dairy industry growth. The dairy industry uses many methods to detect mastitis based on the symptoms of infected animals and their milk. The limitation of such methods are expensive, arduous, and requires samples. In the precision dairying era, rapid, low-cost alternative techniques are in demand by stakeholders, especially farmers. A non-invasive, Infrared Thermography coupled with machine learning algorithms emerged as a promising tool to predict bovine mastitis inn real time. This paper briefly discusses the prevalence of mastitis, related works, and system architecture, and briefly about the experiment carried out using KNN and SVM. With the limited data, SVM and KNN achieved similar accuracy in classifying the disease. The paper also envisages future work by using large data in Indian conditions for accurate diagnosis.

Keywords: Mastitis, Machine Learning, IRT, Thermal Images, Artificial intelligence-in-Animal Health.

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Development and design inputs for wave energy converter

Harsh Kadam[1], Mahesh Rathva[2], Prof. Chetan J. Jayaswal[3], Prof. Alpesh B. Damor[4]
[1,2]Student, Birla Vishvakarma Mahavidhyalaya Engineering College
[3,4]Assistant professor Birla Vishvakarma Mahavidhyalaya Engineering College

Abstract

The research review suggests a novel design for wave energy converter (WEC) applications, incorporating various development inputs. The proposed design aims to reduce the usage of iron and the overall cost of the generator by leveraging composite materials. Additionally, it employs a direct-driven system with permanent magnets to enhance efficiency and reliability while eliminating the need for an external excitation source. Notably, this design does not necessitate a vertical framework, offering a modular and straightforward deployment.

Keywords: wave energy, generators, wave energy converters, renewable sources, direct-driven systems, composite materials, modular design.

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Handwriting detection using machine learning

Jainil Rao[1], Dev Lathigra[2], Purvi Patel[3], Yash Chauhan[4], Dharmadeep Jhala[5]
[1,2,3,4,5] Student VGEC

Abstract

The recognition of handwriting has long been a problem in the fields of machine learning and image processing. Understanding and interpreting handwritten text brings us a world of possibilities, from improving human-computer interaction to digitizing old records. In this work, we describe a novel method of handwriting recognition through the integration of a camera module and the Arduino Nano 33 BLE microcontroller with machine learning.

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Enhancing Signal Processing Efficiency: FPGA-Implemented Moving Average Filters

Ajani Mohit M.[1], A.N.Bhatt[1], C.S.Patel[1]

[1] Birla Vishvakarma Mahavidyalaya Engineering College, V.V. Nagar, Anand, Gujarat, India

Abstract

This Paper investigates the use of a Moving Average Filter (MAF) in signal processing on Field-Programmable Gate Arrays (FPGAs), emphasizing its importance in noise cancellation applications. In different domains, moving average filters are essential for improving data quality by smoothing signals and lowering noise. The paper explains the basic idea behind Digital filters and Moving Average filters and how important they are for noise cancellation. It highlights how they can remove high-frequency noise components from digital data. Designing and perfecting a unique Moving Average Filter for FPGA-based implementation is the primary objective of this study.

Keywords: Moving Average Filter, Digital Filters, FPGAs, Noise cancellation

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Smart and Advanced Safety Vehicle

Saurabh Chaurasiya[1], Aditya Pandey[2], Dr. Mehfuza Holia[3]

[1,2] Electronics Department, Birla Vishvakarma Mahavidyalaya, Anand, India

[3] Electronics Department, Birla Vishvakarma Mahavidyalaya, Anand, India

Abstract

India has the highest number of road accidents. With over 130,000 deaths annually, the country has taken over China. Most of the crashes are due to human errors. 21percent of the accidents results due to drunken drive, drowsiness, over speeding driver's distraction. This project presents the automatic system which will prevent road accidents due to alcohol consumption, over speeding drowsiness. Accidents can be prevented with installation of such system in which the eye blink of driver is continuously monitors to detect the drowsiness. Alcohol sensor is used to detect whether the driver has drunk or not and ultrasonic sensor helps the driver in maintaining the head to head distance between the two vehicles. Additionally, a seatbelt sensor is also used to suffice the prior safety phase of the driver.

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A Comprehensive Study of Fibre Reinforced Polymer Composites: A Review

Nikhar Pandya[1], Dr. I. N. Patel[2], Prof. Vishal Patel[3], Prof. Vimlesh Agarwal[4], Prof. Pratiti Bhatt[5]

[1] Nikhar Pandya, PG Scholar, Birla Vishvakarma Mahavidyalaya Engineering College, Vallabh Vidyanagar, Anand, Gujarat.

[2] Dr. I. N. Patel, Principal, Birla Vishvakarma Mahavidyalaya Engineering College, Vallabh Vidyanagar, Anand, Gujarat.

[3] Prof. Vishal Patel, Assistant Professor, Birla Vishvakarma Mahavidyalaya Engineering College, Vallabh Vidyanagar, Anand, Gujarat.

[4] Prof. Vimlesh Agarwal, Assistant Professor, Birla Vishvakarma Mahavidyalaya Engineering College, Vallabh Vidyanagar, Anand, Gujarat

[5] Prof. Pratiti Bhatt, Assistant Professor , Birla Vishvakarma Mahavidyalaya Engineering College, Vallabh Vidyanagar, Anand, Gujarat

Abstract

Fiber reinforced polymer composites are advanced materials composed of high strength fibers embedded within a polymer matrix, while maintaining a distinct interface between the two components. These composites harness the unique properties of each constituent, resulting in materials with exceptional characteristics. Notably, FRP composites exhibit low density, high tensile strength, and high modulus. This paper presents an extensive review of the research conducted in the field of fibre reinforced polymer composites in recent decades. The focus is on the study of various fibres and their inherent properties of polymer composites reinforced with both natural and synthetic fibres. The paper also reviews the research works that aim at improving these properties, and thoroughly analyses the mechanisms behind the wear phenomena. The enhancement in properties can be achieved through the appropriate selection of fibre, extraction, treatment of fibres, and interfacial engineering.

Keywords: Polymer composites, Synthetic fibres, Natural fibres, reinforcing fibre, glass fibre, kevlar fibre

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Revolutionizing Farming with AgriFly

A Multi-Function Smart Drone for Sustainable Agriculture

Amisha Shyam Sakhare[1], Dhan Ketan Prajapati[2], Dr Robinson Paul[3], Dr Darshan Dalwadi[4]

[1,2] Student of department of EC, BVM College, Vallabh Vidyanagar, Gujarat, India

[3,4] Faculty of department of EC, BVM College, Vallabh Vidyanagar, Gujarat, India

Abstract

The "AgriFly" drone is designed to transform agriculture in India. Farming currently faces issues like excessive pesticide use, labor shortages, and ineffective pest control, leading to lower crop yields and higher costs. AgriFly, a smart drone, integrates tasks like precise pesticide spraying, pest monitoring, fruit picking, and crop health assessment. It offers an affordable and versatile solution that can work in different weather conditions. Its lightweight carbon fiber body makes it efficient. By addressing these challenges, AgriFly aims to enhance farming productivity and sustainability, benefiting Indian farmers and the environment. This innovation promises a brighter future for agriculture in India. Keywords — AgriFly, Indian agriculture, Pesticide control, Farming efficiency, Labor shortage, Crop health, Sustainability, Smart drone, Versatile solution, Environmental benefits.

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Stancu-type modification of Generalized Lupas Operators

Harsh Kothari[1], R.B. Gandhi[2], Shruti Kariya[3]

[1,3] Research Scholar, Gujarat Technological University, Ahmedabad, Gujarat, India,

[2] Department of Mathematics, BVM Engineering College, Vallabh Vidyanagar, Gujarat, India,

Abstract

As a part of this research study, we develop a Stancu-type structure of generalized Lupa¸s operators. Our work also includes the proof of some direct theorems and Voronovskaja-type theorems for the first and second order derivatives.

Keywords: Positive linear operator; Lupa¸s operators; Modulus of continuity; Korovkin-type theorem; Voronvskaja-type theorems. 2010 MSC: 41A10, 41A25, 41A36, 47B30

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Fake News Detection Using Machine Learning and Natural Language Processing

Maitri Patel[1], Krunal Shinde[2], Manav Shah[3], Prof. Bijal Dalwadi[4]

[1,2,3] B.Tech, Department Of Information Technology, Birla Vishvakarma Mahavidyalaya Engineering College, Anand, Gujarat, India

[3] Assistant Professor, Department Of Information Technology, Birla Vishvakarma Mahavidyalaya Engineering College, Anand, Gujarat, India

Abstract

In an era marked by the rapid dissemination of information through social media, the proliferation of fake news poses a critical challenge to the integrity of online information. This research addresses this issue by employing a multi-pronged approach, utilizing logistic regression, decision tree, gradient boosting, LSTM, and BERT models, to discern the veracity of news content. Leveraging a comprehensive dataset sourced from Kaggle, encompassing diverse news articles prevalent on different news papers websites, we train and evaluate these models for their efficacy in distinguishing between genuine and fabricated information. Through NLP, it extracts various linguistic features, including textual patterns, sentiment analysis to build a comprehensive understanding of the content. This research not only contributes to advancing the field of fake news detection but also underscores the necessity for a multifaceted approach in combating misinformation on popular online platforms.

Keywords: Fake news detection; natural language Processing; Bert; Machine Learning

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Pseudomonas stutzeri NC1: A Potent Halotolerant Diesel Oil Degrader and Versatile Biosurfactant Producer Isolated from Dwarka Coast, Gujarat, India

Boski Thakkar[1], Nishant Chaoudhri[2], Nisha Daxini[3]

[1,2,3] Ashok and Rita Patel Institute of Integrated Study and Research in Biotechnology and Allied Sciences, The Charutar Vidya Mandal University, Vallabh Vidyanagar-388120, Anand, Gujarat.

Abstract

In present study, eight native bacterial strains were isolated from Dwarka Coastal region, Gujarat. Among all, halotolerant isolate NC1 screened as potential surfactant producer. When provided with diesel oil as the sole carbon source, NC1 generated around 2.015 g L-1 of biosurfactant and also emulsifying diesel oil effectively (up to 50%). Characterization identified the biosurfactant as a lipopeptide. NC1 demonstrated strong diesel oil degradation, breaking down 85% of the hydrocarbon, and genetic analysis confirmed its identity as Pseudomonas stutzeri. These findings suggest isolate NC1 as a potential candidate for remediating diesel oil in petroleum-contaminated environments.

Keywords: Surface active molecule, Diesel oil, Biodegrdation, lipopeptide, Pseudomonas stutzeri

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A Multi-Mode Frequency Reconfigurable Antenna for 5G and WLAN Applications

Sameer Mansuri[1], Dr.Shahid Modasiya[2], Parul Panchal[3]

[1] Research Scholar Gujarat Technological University, Ahmedabad, Gujarat, India

Abstract

Pin diodes are crucial in the realm of frequency reconfigurable antennas, offering the ability to swiftly shift frequencies and maintain optimal performance. Their widespread use is a testament to their role in enhancing the adaptability and efficiency of wireless communication systems. This research presents a novel design for a frequency reconfigurable antenna using printed monopoles and PIN diodes. The antenna supports nine distinct bands and four modes, facilitated by the on-off states of two PIN diodes. The antenna demonstrates both wide-spectrum and selective-spectrum proficiencies along with good gain, while maintaining a condensed form factor. The design is economical and allows for straightforward manufacturing processes. Notably, the antenna is engineered to accommodate sub-6 GHz 5G bands (2.86, 3.86, 4.41, 4.47, 4.85 and 5.17 GHz), making it an optimal choice for applications in wireless local area networks, 6 GHz fixed satellite services, and IoT-enabled wireless terminals and systems that are integral to the infrastructure of smart cities.This work contributes to the advancement of reconfigurable antenna technology, providing a versatile solution for next-generation wireless communication systems.

Keywords: Conjugate feed; Cross-polarizationt; cylidrical feed; Dual mode feed; Offset reflecor; Reconfigurable antenna;Multi band; Frequency reconfigurability;Sub- 6 GHz; Wi-Max; WLAN;

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Design and Fabrication of Floor Cleaning Machine

Prof. Kinjal Patel[1], Dhruv Maisuria[2], Dhruv Mendhura[3], Jaynesh Tandel[4], Bhumin Patel[5]

[1]Assistant Professor, Mechanical Engineering Department, Birla Vishwakarma Mahavidyalaya, Gujarat, India.

[2,3,4,5] B.E. student, Mechanical Engineering Department, Birla Vishwakarma Mahavidyalaya, Gujarat. India.

Abstract

Cleaning is an essential duty in day-to-day life. Cleaning of floor is a very important for health. Automatic floor cleaners are available in market, but this device aims at making an automatic home cleaning machine that provides dry and wet cleaning with reduced cost and efforts compared to the machines which are already available in the market. This device is able to detect the obstacles and objects in front of it and can continue moving, avoiding the obstacles, until the whole room is cleaned.

Keywords: Dry and wet cleaning; Floor cleaning machine; reduction in cost and efforts.

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Trajectory generation using nine-point circles

R.B. Gandhi[1], Vastavikta R. Gandhi[2]

[1] Birla Vishvakarma Mahavidyalaya (An autonomous Engineering College), Vallabh Vidyanagar – 88 120, Gujarat, India

[2] Schulich School of Engineering, University of Calgary, Calgary, AB, T2N 1N4

Abstract

It is well-known that triangle – a closed geometry constructed using least number of line segments, has many interesting properties. It has capabilities of generating many points, for example, points of concurrency, which can be constructed algorithmically, like orthocentre, circumcentre, in-centre, centre of gravity and all these centres possess interesting properties. In this attempt to know how many points a triangle can generate algorithmically, nine-point circle is one discovery. In this paper author has attempted to present a pattern of triangles which generates trajectories of the points on the corresponding nine point circles, using MATLAB®, empirically and used linear and quadratic regression analysis to find the best fit for the curves with least square error analysis.

Keywords: Nine-point circles, scalene triangles, orthocentre, MATLAB®, linear regression, quadratic regression, least square error

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Promoting technological advancements in a non-invasive manner to facilitate mental health services for women: A Comprehensive Study

Bhoomi Parikh[1], Dr. Zankhana Shah[2]

[1] Research Scholar, PHD Section, Gujarat Technological University, Ahmedabad, Gujarat

[2] Assistant Professor, IT Department, Birla Vishwakarma Mahavidyalaya, Anand, Gujarat

Abstract

The field of clinical psychology requires a thorough investigation in order to effectively diagnose women with sadness and anxiety. Therefore, the use of Artificial Intelligence and Machine Learning Techniques in the field of mental healthcare has the potential to generate substantial advancements, enabling comprehensive preventive measures and management of depression symptoms especially for women. Therefore various hybrid models have been proposed as a means to mitigate risk of depressive symptoms. The rationale for this observation is in the greater influence of social and economic variables on females relative to males. The effects linked to this phenomena might manifest as both immediate and potentially long-lasting. Various factors such as postpartum depression, gender bias, genetic complexity in shared and non shared environment which can be natural or conventional, widowhood, adulthood, separation, loneliness, single marital status and posttraumatic events which may affect mental state of woman. The study focuses on the application and integration of various machine learning methodologies, including LSTM (Long Short Term Memory), Bi-Directional LSTM (BiLSTM), Local Interpretable Model-Agnostic Explanations (LIME) on Convolutional Neural Networks (CNNs), Deep Neural Networks (DNNs) and Recurrent Neural Networks (RNNs). The main objective of this study is to emphasize the identification of distinct indicators of depression in women and the capacity to process diverse forms of data within this domain, while integrating various components of Artificial Intelligence and Machine Learning.

Keywords: clinical psychology, Artificial Intelligence, LIME (Local Interpretable Model-Agnostic Explanations), Machine Learning , rationale

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Fake Product Detection Using Blockchain

Nikita Dayma[1], Shreenath Badwane[2], Mayank Mahajan[3], Chitra Bhole[4]

[1,2,3,4]K J Somaiya Institute of Engineering and Information Technology

Abstract

The spread of counterfeit goods has raised serious concerns among regulators, manufacturers, and consumers with the introduction of e-commerce and digital transactions. The presence of phony goods threatens consumer safety and undermines customer confidence in addition to other negative effects. The effectiveness of using conventional authentication and traceability approaches to handle this problem has been demonstrated to be insufficient. Blockchain, as an immutable and decentralized ledger system, offers a promising platform for ensuring trust and authenticity in supply chains. The system's main features include product registration on the blockchain, the use of unique product identifiers, and the recording of each step of the supply chain trip as an immutable transaction.

Keywords: Counterfeit goods, Blockchain, Decentralized ledger system

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Facial Emotion Recognition using deep learning

A.B Bambhaniya[1], Viny Selopal[2], Deepak Vala[3], Jagdish Rathod[4], Devang Rathod[5]

[1,2,3,4,5] BVM Engineering College, Vallabh Vidhyanagar, 388120

Abstract

Facial emotion recognition (FER) is a crucial topic in the fields of computer vision, artificial intelligence, robotics and automation, owing to its significant potential in the professional and industrial domain. Although FER can be conducted using multiple sensors and methods, this project focuses on using facial images, and gathering visual data of expressions. We know that while comprehending a person's emotions during interaction, facial expressions come to the most usage and it is like looking into someone's brain via their expressions. In this project, I am going to use the deep-learning approach using Convolutional Neural Networks, to evaluate a person's emotion by acquiring their spatial facial features in real time. The framework that I am going to use is the latest method in use. We exploit GPU computation and capture the pixel data through video streaming of our webcam. Next we exploit Keras and Tensorflow to train our model.

Keywords: CNN, FER, Sequential model. Keras, Tensorflow, GPU,overfitting, HAARCascade.

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Food Quality Monitoring

Arjun Bambhaniya[1], Deepak Vala[2], Jagdish Rathod[3], Mehfuza Holia[4], Devang Rathod[5]

[1,2,3,4,5] BVM Engineering College, Vallabh Vidhyanagar, 388120

Abstract

This paper outlines the IoT food-monitoring framework so that it stays fresh, healthy, and unaffected due to the conditions surrounding storage and transportation. The proposed solution analyzes temperature, humidity, and light as these components affect the prices of healthy foods such as fruits and vegetables. The connection of such a sensor to food packaging technology has engraved a clever way of packaging food. These integrated systems can provide reliable information. The system contains heat, moisture, gas sensors, which provide the necessary information to assess the quality of a vegetable or fruit.

Keywords: Food monitoring, IoT, Sensors

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Face Recognition-based Group Attendance Marking System

Burhanuddin Limdiwala[1], Mohammed Kunda[2], Deepak Vala[3], Jagdish Rathod[4], Mehfuza Holia[5]

[1,2,3,4,5] Electronics Department, Birla Vishvakarma Mahavidyalaya, Anand, India

Abstract

The project's outcome and execution are based on machine learning methods to enable facial recognition-based group attendance. The machine learning approach used to implement the present methodology are residual networks, which aid in the resolution of some issues caused by convolutional neural networks. The theoretical framework is based on the haar cascade, a basic machine learning approach in which the classifier is created from a large number of positive and negative photos. The models has been taught to work in real-time as well as on pictures of groups and to coordinate numerous subjects simultaneously. The image of the user is captured and compared to a dataset of pre-trained tagged faces.

Keywords: Machine Learning, CNN, Face Recognition, Attendance Marking System.

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Image Captioing Using Deep Learning – An Overview

Kartik Sharma[1], Deepak Vala[2], Jagdish Rathod[3], Mehfuza Holia[4]

[1,2,3,4] Electronics Department, Birla Vishvakarma Mahavidyalaya, Anand, India

Abstract

This research paper presents a robust image captioning system developed using advanced deep learning techniques. Leveraging a diverse dataset from Flickr, the study integrates a pre-trained VGG16 model for feature extraction and LSTM networks for caption generation. The system excels in generating meaningful captions for various images, enhancing accessibility for visually impaired individuals. Noteworthy is the seamless integration of text-to-speech functionality, making the generated captions accessible through spoken words. The paper discusses the system's architecture, data preprocessing intricacies, and evaluation metrics, providing a comprehensive analysis of results and real-world implications.

Keywords: Image Captioing, deep learning, artificial intelligence

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An Improved Voltage Gain Dc to Dc Converter for Green Energy Application

Bharani G[1], Pradeepa S[2], Ramya M[3], Ruba P[4]

[1] Assistant Professor, Electrical and Electronics Engineering, M.Kumarasamy College of Engineering, Karur,Tamil Nadu,India

[2,3,4] UG Student, Electrical and Electronics Engineering, M.Kumarasamy College of Engineering, Karur,Tamil Nadu,India

Abstract

A unique direct current to direct current step-up converter with significant voltage boost that is suited for green energy implementation is presented in this piece of work. Energy conversion technologies must be efficient due to the growing need for renewable energy sources like solar and wind power. The proposed converter addresses the need for enhanced voltage step-up capabilities while ensuring high efficiency and reliability in renewable energy systems. The converter utilizes advanced power electronic techniques, including high-frequency switching to achieve a significantly higher voltage gain than conventional converters. By efficiently stepping up the output voltage from renewable energy sources, it enables the seamless integration of these sources into the existing power grid and ensures optimum power utilization.

Keywords: Voltage Step-Up, Power Electronics, High Voltage Gain

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Women and Sustainable Development through Communication Skills for IT Engineering Graduates: A Study

Dr. Dipakkumar A. Bhatt[1], Mrs. Pooja D. Bhatt[2]

[1]Assistant Professor Vishwakarma Government Engineering College, Chandkheda

[2]Assistant Professor Silver Oak University, Ahmedabad

Abstract

Communication skills play a crucial role in the life of an engineering professional as well as an academician. The present paper is an attempt to understand the difficulties faced by the engineering students, especially the Information Technology female students, from HR (Human Resource Manager) perspective for recruiting an engineering graduate with regards to their Communication skills. It has been largely observed through research (PhD these and research articles) that majority of the IT female engineering graduates lack in the basic communication skills in English and are victim while presenting themselves properly in interviews and placement. Hence, a study to understand the Human Resource Managers' perspective was taken by the researcher as a PhD survey in the year 2020 so that the skills required by the industry while recruiting the IT female engineering graduates can be found and in the larger interest of the students. 13 HR executives from recruiting companies located in Gujarat State were asked to participate in a survey through a questionnaire and then their answers were analysed to understand the communication skills required by engineering graduates before going for a placement activity.

Keywords: HR executive, communication skills, recruitment, female engineering graduates, problems, Information Technology

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SLHD: Safety of Little Heart Device to Protect Crime Against Girl Child

Kamini Solanki[1], Shailesh Khant[2], Jaimin Undavia[3], Atul Patel[4]

[1,2,3,4] Faculty of Computer Science and Applications, Charusat, Changa, Anand, India

Abstract

Crime against the children specifically girl child in India is terrifically getting common in recent times. In reality, every day, at least five news articles describe the horrifying specifics of separate atrocities. The child safety in India is horribly low especially where kids are treated like god or goddess. The crime rate against the child is very high and getting increased day by day in India. The crimes like domestic abuse, harassment, child labor and other similar issues are prevalent throughout the nation. So as, being an IT professional we proposed a solution through which a child can use it to come out from the critical situation. In the proposed system when anything unwanted happens against the child, the device senses the body temperature, rate of heartbeat, voice frequency and also recognizes the word like "MUMMY", "HELP", and triggers some notifying actions. The actions include SMS, multiple calling, sharing live location, tracking, capture images and notifying the guardian. Guardian can then listen the voice of a child through mic by switching on the mic through android application.

Keywords: Cloud Computing, IoT, GPS, GSM, SMS, Firebase, camera, mic, LED, WIFI, Battery

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Experiment Study on Precast Structure and Cast in Situ Structure for Metro Project in Gujarat (A Case Study of Gujarat Metro)

Mr. Milan Viradiya[1], Prof. Jagruti shah[2], Prof. (Dr.) Indrajit Patel[3]

[1] M.Tech Student, Department of Infrastructure Engineering & Technology, BVM Engineering Collage, Vallabh Vidyanagar, Anand, Gujarat, India.

[2] Assisstant Professar, Department of Infrastructure Engineering & Technology, BVM Engineering Collage, Vallabh Vidyanagar, Anand, Gujarat, India.

[3] Professar, Department of Structural Engineering, BVM Engineering Collage, Vallabh Vidyanagar, Anand, Gujarat, India.

Abstract

India is the fastest-growing developing country and Most a Rapid change in the development of the field of urban infrastructure in recent times. Metro projects are capital-intensive public-oriented projects. Due to the cost of economic and timely completion of the project, the precast concrete method is widely used in infrastructure projects like Metro, Flyover, and Bridge etc. for the Reduce the construction time and space, reduce traffic issues, reduce pollution, reduce environmental impacts. The cast in situ methodology have need some time & space and is inconvenient to public. Therefore use of precast members to the best preferred option for elevated metro projects in urban areas. This paper focus on the importance of precast methodology in infrastructure projects and summarize the role of time, cost, quality and productivity of the precast technique.

Keywords: Precast Concrete, Precast viaduct and Station, Time, Cost and Quality analysis Rapid infrastructure growth.R executive, communication skills, recruitment, female engineering graduates, problems, Information Technology

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Experimental Investigation on Nitrogen Oxides Pollutant Reduction Characteristics of Cement Mortar using Photocatalytic Material

Jaydeep J. Chavda[1], Dr. Indrajit N. Patel[2], Prof. Jagruti P. Shah[3], Dr. Jayeshkumar R. Pitroda[4], Dev Bhavsar[5]

[1] Ph.D. Research Scholar, Gujarat Technology University (GTU), Ahmedabad, Gujarat, India

[2] Professor and Principal, Birla Vishvakarma Mahavidyalaya (BVM) Engineering College, Vallabh Vidyanagar, Gujarat, India

[3] Assistant Professor, P.G. Coordinator of Infrastructure Engineering & Technology, Birla Vishvakarma Mahavidyalaya (BVM) Engineering College, Vallabh Vidyanagar, Gujarat, India

[4] Associate Professor, P.G. Coordinator of Construction Engineering & Management, Civil Engineering Department, Birla Vishvakarma Mahavidyalaya (BVM) Engineering College, Vallabh Vidyanagar, Gujarat, India

[5] M.Tech. (Civil) Construction Engineering & Management, Birla Vishvakarma Mahavidyalaya (BVM) Engineering College, Vallabh Vidyanagar, Gujarat, India

Abstract

Ever since the starting of the urbanization and industrial revolution, the world has battled the by-product of increased productivity and that is 'pollution.' Specifically, air pollution has been worrisome considering global problems of greenhouse gas effect and global warming. Nitric oxide and Nitrogen Dioxide are considered as major air pollutants which are combinedly known as nitrogen oxides (NOx). Titanium dioxide (TiO2) powder in cement mortar act as photocatalyst and reduces NOx from the exposed air in presence of ultraviolet light. In this paper, TiO2 powder is added in cement mortar in varying percentages and its effect on compressive strength of cement mortar is analyzed and optimum percentage of strength increase is obtained at 2.0% TiO2 replacement. Secondly, TiO2 based cement mortar is studied for NOx pollutant reduction test under control conditions. The results indicate that the TiO2 based cement mortar shows around 36% percentage reduction of NOx pollutant in comparison of conventional cement mortar. Further, the tested specimen also has been analyzed for its surface microstructure analysis using Scanning Electron Microscope test. From the visual inspection of SEM images, a noticeable difference has been observed between the surface microstructure of conventional cement mortar and TiO2 based cement mortar. Cost comparison is also performed for different mixes of cement mortar.

Keywords: Cement Mortar; Compressive Strength; Nitrogen Oxides (NOx); Photocatalytic; Scanning Electron Microscope (SEM); Titanium Dioxide (TiO2)

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Examining the planetary boundary layer height trend for South Gujarat Region

Neha Patel[1], Smit Vasava[2], Chaudhari Jaimin[3], Khaped Kushal[4], Chaudhari Harshil[5]

[1] Associate Professor, Civil Engineering Department, Birla Vishvakarma Mahavidyalaya, Anand-388120, Gujarat, India.

[2,3,4,5] Undergraduate Student, Civil Engineering Department, Birla Vishvakarma Mahavidyalaya, Anand-388120, Gujarat, India.

Abstract

Planetary Boundary Layer height (PBLH) is a crucial parameter in climatology and air pollution research. The study examined the PBL height trend using the Mann-Kendall slope and Sen's slope over the South Gujarat Region during 1980-2022, utilizing PBL height data obtained from Modern-Era Retrospective Analysis for Research and Applications, Version 2 (MERRA-2) for the past 42 years. The analysis observed that decadal trend exhibited a normal behaviour from 1980 to 2004, but a significant change has been observed from 2005 onwards. Additionally, the seasonal trend indicated that the post-monsoon season exhibited a highly variable trend compared to the other seasons.

Keywords: Planetary Boundary Layer Height, MERRA-2, Sen's lope, Mann-Kendall slope

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Preliminary estimation of Bisphenol A in different waters from Bhuj city of Gujarat, India

Dipa Lalwani[1], Hiral Soni[2], Mrugesh Trivedi[3], Jyotindra Bhatt[4], Dhruma Vaidya[5], Nirmal Kumar J.I.[6]

[1,6] Institute of Science & Technology for Advanced studies & Research, Vallabh Vidyanagar, Anand, Gujarat, India

[2]Ashok & Rita Patel Institute of Integrated study & Research in Biotechnology & Allied Sciences (ARIBAS), Vallabh Vidyanagar, Anand, Gujarat, Gujarat, India

[3,5] Department of Earth & Environmental Science, KSKV Kachchh University, Bhuj-Kachchh, Gujarat, India

[4] Department of Chemistry, KSKV Kachchh University, Bhuj-Kachchh, Gujarat, India

Abstract

As an Endocrine disruptor Bisphenol A (BPA) has become well-known for its ubiquitous distribution and toxic effects. However, less is known about levels of BPA in different waters of Gujarat state in India. In the present study, 23 water samples including wastewater, surface water, groundwater, and drinking water samples were analyzed for the determination of BPA. pH, Electrical conductivity (EC), and total dissolved solids (TDS) were measured for all the samples. Sample extraction was performed using solid phase extraction and further quantification was done using Waters Acquity Ultra Performance Liquid Chromatography (UPLC) H-Class interfaced with a Photodiode array (PDA) detector. BPA concentrations among all samples ranged from 14.5–121 µg/L (Median: 46.9 µg/L). The highest concentration was seen in wastewater samples, whereas drinking water samples remained undetected for BPA. More studies about BPA levels in different waters in Bhuj city and Gujarat are recommended.

Keywords: Bisphenol A, Bhuj, Surface water, Wastewater, Gujarat

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Augmenting Digital Shopping Experience of Customers through Affective E-Commerce

Rishabh Bhatia[1], Rishi Bhatia[2], Munshi Yadav[3], Rekha Bhatia[4]

[1]Associate Manager, HCL Technologies

[2]Director Data Science, Walmart Global Tech

[3]Dean GTBIT, New Delhi

[4]Professor & Coordinator(CSE Department), Punjabi University Centre for Emerging and Innovative Technology, Mohali

Abstract

Digital shopping has grown at an exceptional rate in the last two years as the COVID pandemic and resulting lockdowns have transformed everything from customers' preferences to their behavior. The unprecedented growth in digital shopping means product and service sellers need to pay a lot of attention to customers' online experience as well as their satisfaction. With more people buying products and services digitally through the internet than ever before, it is crucial for today's online sellers to work smart enough to meet the changing customer expectations and requirements in order to gain their trust and retain them. To survive in this rapidly changing customer-led competitive era, knowledge about their discomforts while making online purchases and learning about what induces the right emotions in them, can help sellers win loyal and repeat customers. The customers express emotions through facial expressions, body gestures, and voice tone patterns. Affective computing, a term developed by MIT professor Rosalind Picard, can measure emotions in customer behavior, and in the next couple of years, we can visualize Affective e-commerce as the future of online sales. This paper utilizes one aspect of affective computing, that is, facial emotions to measure the satisfaction of customers and personalize the digital shopping experience.

Keywords: E-Commerce, Affective Computing, Digital shopping, Emotions recognition, Facial expressions

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Approximation properties of Kantorovich type modification of generalized Lupaş operators

Shruti S. Kariya[1], R.B.Gandhi[2]

[1] Research Scholar, Gujarat Technological University, Ahmedabad, Gujarat, India

[2] Department of Mathematics, BVM Engineering College, Vallabh Vidyanagar, Gujarat, India

Abstract

This article presents a Kantorovich-type modification of the generalization of Lupaş operators. We investigate the approximation properties of the defined operator. Korovkin-type theorem, Local approximation properties, and Voronovskaja-type theorem are discussed throughout the paper.

Keywords: Positive linear operator, Lupaş operators, Local approximation, Modulus of smoothness, Voronovskaja-type theorem MSC 2020: 41A25, 41A35, 41A36

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Performance Analysis of Lean Six Sigma using Machine Learning Approach

Dr. Kaushika D. Patel[1], Dr. Darshankumar C. Dalwadi[2], Dr. Rakesh D. Patel[3],

[1] Assi. Professor, BVM Engineering College, Vallabh Vidyanagar,

[2] Asso. Professor, BVM Engineering College, Vallabh Vidyanagar,

[3] Head, Mechanical Engineering Depatment, B and B Institute of Technology, Vallabh Vidyanagar

Abstract

The quality improvement phenomena known as Lean Six Sigma (LSS) has caught the industry's interest. By combining the best practices from Lean and Six Sigma, LSS has been proved to increase business efficiency and customer experience by aiming for a capability level of 3.4 faults per million opportunities (Six Sigma) and effective (lean) processes. Numerous companies have tried to use LSS, but not all of them have been successful in enhancing business operations to provide desired results. Therefore, for LSS to be implemented effectively, it will be very valuable to understand the cause-and-effect links of the LSS enablers while also gaining deeper insights into how the LSS strategy functions. The variety of Critical Success Factors (CSFs) recommended by many conceptual papers dominates the LSS literature, and very few attempts have been made to tie these CSFs to an organized theory on LSS. The paper aims to fill this gap by employing a cutting-edge technique that uses machine learning, more specifically Natural Language Processing (NLP), with a focus on the use of cross-domain knowledge to create a condensed collection of constructs that describe the LSS phenomena.

Keywords: Artificial Intelligence; Lean Six Sigma (LSS); Critical Success Factors (CSFs); Machine Learning; Natural Language Processing (NLP); Continuous Improvement; Classification Model; Word Embedding.

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Comprehensive Analysis of Microstrip Patch Antennas in the Context of Satellite Communication

Dhrumil Gajera[1], Prit Vadalia[2], Dr. Darshankumar C. Dalwadi[3], Dr. Kaushika D. Patel[4]
[1,2,3,4] Birla Vishvakarma Mahavidyalaya Engineering College, Vallabh Vidyanagar

Abstract

Utilizing readily available, inexpensive FR4 material, microstrip antennas are constructed. The HFSS simulation is used to analyze the antenna characteristics, and it is widely employed in satellite communication due to its advantages over traditional antennas. According to a literature review on patch array antennas (PAA), numerous techniques were used to create smaller-sized patch array antennas. In this study, 2.4GHz microstrip antennas and a 2x2 strip array antenna are presented. The simulation results for the 2.4GHz microstrip antenna show a 5.5dB antenna gain. Additionally, the 2x2 strip array antenna operating at 12 GHz exhibits an 80-degree beamwidth, a bandwidth of 693.6 MHz (5.9%), a gain of 8.98 dB, a directivity of 10.83 dB, and an efficiency of 83%. The substrate utilized for both antennas is FR4 with a thickness of 1.6mm and a dielectric constant of 4.4. The 2x2 linear array is specifically designed for line feeding and is tailored for satellite communication purposes.

Keywords: Microstrip Patch Array, Antenna, HFSS, Satellite communication, Radiation Pattern, Return Loss.

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Survey on Massive MIMO and Smart Antenna System

Prathviraj Singh[1], Dhweep Shah[2], Dr. Darshankumar C. Dalwadi[3], Dr. Kaushika D. Patel[4], Dr. Robinson Paul[5]
[1] Research Scholar, BVM Engineering College, Vallabh Vidyanagar,
[2] Research Scholar, BVM Engineering College, Vallabh Vidyanagar,
[3] Asso. Professor, BVM Engineering College, Vallabh Vidyanagar,
[4] Assi. Professor, BVM Engineering College, Vallabh Vidyanagar,
[5] Assi. Professor, BVM Engineering College, Vallabh Vidyanagar,

Abstract

This is to help understand how “Massive MIMO and Smart Antenna Systems” can serve multiple users simultaneously within larger area using Massive MIMO by significantly increasing number of antennas, advancing spectrum efficiency and employ intelligent signal processing techniques to enhance communication performance by improving signal-to-noise ratio (SNR), dynamically adjusting radiation patterns, and suppressing interference induce nulls in the created patterns by via Smart Antenna Array.

Keywords: Massive MIMO; Smart Antenna; Spectrum Efficiency; Signal Processing; SNR; Radiation Pattern; Null interferencene Learning; Natural Language Processing (NLP); Continuous Improvement; Classification Model; Word Embedding.

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To Study Nutritional Status and prevalence of Insulin Resistance in Rural Adolescents Residing in Anand

Nimisha Shah[1], Shazia Sharma[2]

[1] Visiting Faculty & consulting Dietitian, Baroda Laparoscopy hospital, Ahmedabad, Gujarat

[2] Assistant professor, S.M.Patel College of Home Science, S.P.University, VallabhVidhyanagar, Anand, Gujarat.

Abstract

Aim: The study was carried out to understand insulin resistance in rural adolescence. So far no studies were done over the rural areas of Anand District. Objective: To study Nutritional Status and prevalence of insulin resistance among young adolescents age 13 years to 15 years Boys and Girls. Methodology: A semi structured questionnaire was used to collect quantitate data for height, weight, age, gender, income group and physical activity level. The bio chemical profile of each subject was analyzed using the following markers: Fasting Sugar, fasting Insulin, insulin resistance and HOMA1 and HOMA2 was calculated, analysis of total Cholesterol and Triglycerides was also done. Physical activity level was assessed through Satyanarayan method and dietary intake through 24 hour dietary recall method and food frequency. Data were analyzed using SPSS 17. Results: Cross-sectional study was conducted and 171 students (101 Boys and 70 Girls) aged 13-15 years were purposely selected. The families of subjects only 12% were aware about their health and nutrition but they were 67% healthy. The mean weight of boys aged 13 years was 43.38 kg ±13.22, 14 years 52.82 kg ±13.78 and for 15years 53.74kg±16.44. Whereas 46.64 kg±11.47, 47.31 kg ± 9.06 & 49.19 kg ± 14.19 for 13, 14 & 15 year girls respectively. Mean height of Boys aged 13 years was 150.81cm±8.49, 14 years 158.55 cm ± 7.94, 15 years 160.48cm ± 7.78 Whereas 154.48 cm±5.18, 152.13 cm ± 6.06 & cm ± 14.19 for 13, 14 & 15 year girls respectively. Correlation between Height and Weight, Weight and BMI, Waist Circumference and Hip Circumference are significant at the 0.01 level ($P<0.01$) (2-tailed). Correlation between Weight and Waist Circumference, Weight and Hip Circumference, BMI and Waist Circumference, BMI and Hip Circumference are significant at the 0.05 level ($P<0.05$) (2-tailed). The PAL value showed that among boys 28% (n=28) were sedentary, 42% (n=43) moderately active and 30% (n=30) vigorously active. The PAL value in girls showed 31% (n=22) sedentary, 52% (n=36) moderately active and 17% (n=12) vigorously active. The percentage of HOMA1 in subjects age 13 years were 37% (n=18) borderline and 63% (n=31) High. The percentage of HOMA1 in subjects age 14 years were 28% (17) borderline and 72% (n=44) high. The percentage of HOMA1 in subjects age 15 years were 34% (21) borderline and 66% (n=40) high. Significant association was seen in BMI, Triglyceride, HOMA1, pre diabetic and intake of Energy carbohydrate & Fat at $p<0.05$ levels in 13, 14 and 15 years Boys and Girls. Conclusion: The study found that dietary habit specially consuming more than recommended RDA (as per ICMR 2020) of fat (saturated and trans) which directly correlated to HOMA-IR is predictor of pre diabetic and metabolic syndrome.

Keywords: Adolescent, BMI, cholesterol, Triglycerides, PAL, Insulin resistance, HOMA1, HOMA2 and dietary intake.

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Furniture Fusion: Elevating Your Shopping Journey

AR Furniture Application Development and Implementation for Diverse User Engagement

Jayati Raval[1], Prof. Prachi Shah[2], Ayush Patel[3]

[1,2,3] Birla Vishvakarma Mahavidyalaya, Gujarat, India

Abstract

ARtistic Home, an innovation testament, is an Augmented Reality (AR) Furniture Application. Merging technology and creativity, it redefines interior design. Beyond an application, it's a personalized experience for homeowners, designers, retailers, architects, DIY enthusiasts, and rental services. ARtistic Home integrates virtual furniture into real spaces, revolutionizing how users interact with furniture. Simplifying placement and purchase, it empowers users to effortlessly visualize dream furniture. With diverse options and user-friendly design, ARtistic Home transforms the ordinary. Beyond a tech marvel, it is a gateway to a future where envisioning living spaces is personal. It is not just furniture; it brings unique visions to life. Users immerse in a transformative experience where imagination knows no bounds, living spaces become canvases for dreams. ARtistic Home—a revolution where technology meets personal expression.

Keywords: Augmented Reality; User Interface; 3D Visualization;

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"Agnistambh"-The Smokeless Vertical Chulha

Dr.Smita B Joshi[1]

[1] Assistant Professor, Department of Applied Science and Humanities, G.H .Patel College of Engineering and Technology Vallabh Vidyanagar, India ,sbjoshi@gmail.com

Abstract

Food is the basic need of human beings. Cooking food requires much technological advancement as about 90% of rural households in India are still dependent on biomass fuels. A prototype of vertical Chulha, "Agnistambh" has been designed and developed for cooking two or three items simultaneously. Efforts have been made to reduce the smoke coming out of Chulha by making a chimney using a small pipe to take out the smoke from the kitchen. It is made with Galvanized iron and has 3 improved combustion chambers the lower compartment is for making rice, pulses or vegetables while the upper compartment is designed for making roti, the middle compartment can be used for baking and keeping the food hot. The fuel used for cooking food is garden waste and cow dung cake which is made with the dry leaves collected from the college campus. A vertical Chulha may be proven a boon to the village women, and street vendors, making food for school students under Madhyan Bhojan Yojna.

Keywords: cook stove, energy source, efficiency, fossil fuel, smokeless chulha.

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A Computational approach to drug design against West Nile Virus' envelope epitopes

Bhargavi Patel[1], **Hiral Sonia**[2], **Pratiksha Gondkar**[3], **Khushal Patel**[4]

[1,2] Ashok and Rita Patel Institute of Integrated Study and Research in Biotechnology and Allied Sciences, New Vallabh Vidyanagar-388121, Gujarat, India

[3,4] Department of Medical Laboratory Technology, Bapubhai Desaibhai Patel Institute of Paramedical Sciences (BDIPS), Charotar University of Science & Technology (CHARUSAT), Changa, Anand, Gujarat- India- 388421

Abstract

West Nile Virus tends to be spread by mosquitoes and causes feverish illness during infection that could further develop into encephalitis. With the help of an immunomics approach, the vaccine can be developed from epitopes and drug candidates designed against WNV. Human WNV envelope glycoprotein sequences were derived and selected as a therapeutic target in this study. Out of 365 amino acid sequences, 22 were selected based on their antigenicity score (i.e., 0.5 - 0.7). After the use of the developed pipeline, 'KTFLVHREW' & 'ITPAAPSYT' were selected as the most potential T-cell & B-cell epitopes. Four novel drugs were also designed and validated from a known WNV inhibitor, AP12430. QSAR and ADME properties valuation confirmed the efficiency of these designed candidates. The in-silico outputs confirmed, that the predicted epitopes can elicit the immune response & designed drugs can act as therapeutic agents against infection and further research on Animal models is needed.

Keywords: drug design, west nile virus, immunomics, vaccine

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Evaluating the Suitability of Aggregate and Grout for the Development of Semi-Flexible Pavement

Mr. Dhaval Mistry[1], Prof. Jagruti shah[2], and Dr. Indrajit Patel[3]

[1] PG Scholar, Department of Master of Technology, BVM Engineering Collage, Vallabh Vidyanagar, Anand, Gujarat, India.

[2] Professor, Department of Infrastructure Engineering and Technology, BVM Engineering Collage, Vallabh Vidyanagar, Anand, Gujarat, India.

[3] Professor, Department of Structure Engineering, BVM Engineering Collage, Vallabh Vidyanagar, Anand, Gujarat, India.

Abstract

With greater flexibility in the surface or wearing course and resistance to rutting compared to both concrete and traditional asphalt, semi-flexible pavement offers several advantages. Its impermeable covering also offers good protection against water seeping into the foundation. The semi-flexible substance, commonly referred to as grouted macadam, is made up of an open-graded asphalt framework with 25–35% gaps that are filled with a cementitious slurry. This hybrid blend offers excellent resistance to rutting and a surface that is very impervious to oil and fuel spills. Because of these characteristics, it can be employed at harbors, airports, and industrial areas—places where slow and heavy traffic is common. Grouted Macadams are a little-known area of pavement technology that are typically limited to a specific function in specialty pavements whose performance is only estimated based on empirical data. Thus, this study's primary goal was to gain a better understanding of the aggregate gradation and grout needs in order to create a semi-flexible pavement. The compressive strength and fluidity of the grout mixtures made with additional cementitious material were assessed. The drain down test, marshall stability, indirect tensile strength, tensile strength ratio, and maintained stability were used to evaluate the surface dressing gradation of 13 mm nominal maximum aggregate size.

Keywords: Semi-flexible pavement, Grout, Fluidity, Open-graded friction course, Drain down test, Surface dressing, Optimum compaction.

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Comparison of antioxidant potential and hemolytic activity of Piper nigrum and free piperine.

D. N. Patel[1], K. J. Gamit[2], A. S. Hafeji[3], G. J. Senapathy[4]

[1,2,3,4] C G Bhakta Institute of Biotechnology, Uka Tarsadia University, Gujarat, India

Abstract

Piper nigrum, a plant with bioactive phyto-compounds, has been extensively researched for its biological properties and medicinal properties, making it an essential part of human nutrition. Black pepper is a rich source of natural antioxidants which play a role in the prevention of the development of various diseases, particularly cause by oxidative stress. Hemolysis occurs when foreign substances rupture red blood cells (RBCs) to release hemoglobin, and drugs intended for intravenously administered applications may also undergo this process. So, we have compared the antioxidant potential of piperine and Piper nigrum in this research. Furthermore, the hemolytic activity of the medication and extract is also emphasised.

Keywords: Piper nigrum, Piperine, Antioxidant activity, Hemolysis, Free radical

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Sustainable Highway Subgrades for Unsaturated Saline Coast in Ahmedabad Region

Mr. Vijayant Singh[1], Prof. Jagruti Shah[2], Mrs. Meera Jani[3]

[1] Postgraduate Scholar, M-Tech, Infrastructure Engineering and Technology, BVM Engineering College, V.V Nagar

[2] Professor, Department of Infrastructure Engineering and Technology, BVM Engineering College, V.V Nagar

[3] Project Engineer, Geo Designs & Research (P) Ltd., Vadodara

Abstract

The current contextual analysis talks about the subgrade improvement systems for profoundly saline marine soils situated at coastal line of Ahmedabad Region, Gujarat, India. Notwithstanding the presence of different salts, the immersion levels of these soil particles were seen to fluctuate all through the year because of a few climatic and geological variables. At first, the standard filter paper method is used for assessing the unsaturated way of behaving. Because of the low in situ California bearing Ratio (CBR) value (1.61%), locally accessible fly ash (5%-25% by weight) was utilized to work on the strength and solidness of the soil mass. Addition of fly ash brought about the extensive decrease of salinity. The unconfined compressive strength (UCS) and CBR have expanded until 15% fly ash and decreased from thereof. The maximum CBR got was around 9%, which can endure low to medium volumes of traffic. Be that as it may, the UCS created at seven days was seen to decrease at 28 days. This might be because of the auxiliary responses and change of type of salts present in the lattice. Consequently, further examinations on connections at miniature level and development of optional mixtures were prescribed to set up an economical subgrade in this landscape.

Keywords: Coastal Region of Ahmedabad, Fly ash, Salinity

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Sustaininable Solid Waste Management by Integration of waste at Taluka level-A Case study of Petlad, Gujarat

Chirag R.Prajapati[1], Prof.Jagruti Shah[2], Prof.Pratiti Bhatt[3], Dr.Indrajit Patel[4]

[1] M.Tech Student, Infrastructure Engineering & Technology, BVM Engineering College, V.V Nagar

[2] Assistant Professor, Department of Structural Engineering, BVM Engineering College, Vallabh Vidyanagar Anand (Gujarat), India.

[3] Assistant Professor, Department of Structural Engineering, BVM Engineering College, Vallabh Vidyanagar Anand (Gujarat), India.

[4] Professor, Department of Structural Engineering, BVM Engineering College, Vallabh Vidyanagar Anand (Gujarat), India

Abstract

As per the 2011 registration data,68.84% of the total population in India live in rural areas. It has been found that the most of studies on solid waste management in India have town, while less attention has been paid to small-scale town and their surrounding villages. Which will lead into unscientific disposal of municipal solid waste through open dumping in low-lying area or dumping waste near water bodies. The presented study emphasis on rural areas of Petlad Taluka, in which major amount of generated waste is decomposable. Integration of waste by forming clusters of villages and small-scale towns through route optimization particularly for inert waste, generated decomposable waste can be directly decomposed through vermicomposting facility and recyclable waste can be recycled by recycle industries. This can be seen as a sustainable solution to the successful management of the MSWM facility.

Keywords: Cluster formation, Cost efficiency, Integrated solid waste management, Rural and semi- rural areas, Route optimization, Sustainable solid waste Management.

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Optimization of Rod Cutting

Shivam Patel[1], Mosin Ibrahim Hasan[2], Jay Panchal3, Maitry Chaudhari[4]
[1,2,3,4] Computer Engineering Department, Birla Vishvakarma Mahavidyalaya, Anand, India

Abstract

This paper addresses a critical challenge faced by industries in their manufacturing processes – the efficient utilization of raw materials during the production of requested rod lengths as per client specifications. Traditionally, industries have struggled with substantial raw material wastage and the generation of unnecessary waste, contributing to environmental harm and financial losses. This wasteful practice not only harms the environment but also negatively impacts the bottom line of industries. It provides a solution to this pressing issue by introducing an innovative approach of "Column generation" that optimizes the utilization of raw materials. By implementing the given proposed solution, industries can expect several significant benefits. Firstly, they can drastically reduce raw material wastage, leading to a substantial decrease in their need to purchase additional raw materials. Additionally, this optimization process minimizes waste generation, further contributing to a more sustainable and environmentally friendly manufacturing process. In summary, the "Optimization of Rod Cutting" paper offers industries a valuable tool to enhance their operations, reduce raw material waste, and ultimately promote both economic and environmental sustainability. This paper represents a crucial step towards a more efficient and responsible industrial landscape.

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Evaluating the Effect of Aeration on Growth Conditions for Commercial Baker's Yeast: A Comparative Study on Batch Fermentation Processes with Saccharomyces cerevisiae.

Pragna Ukani[1], Pratiksha Gondkar[2], Debayan Baidya[3], Khushal Patel[4], Darshan H. Patel[5], Hemant Kumar[6]
[1,2,3,4,6] Department of Medical Laboratory Technology, Bapubhai Desaibhai Patel Institute of Paramedical Science, Charotar University of Science and Technology, Changa, Anand, Gujarat- India-388421.
[5] Department of Biological Sciences, P.D. Patel Institute of Applied Sciences, Charotar University of Science and Technology, Changa, Anand, Gujarat- India-388421.

Abstract

This study aims to evaluate the yield of cell mass from sugarcane molasses using different commercial yeast strains under various conditions. Initially, five commercial yeast strains were assessed, and one sample exhibiting higher cell viability (Strain A) was selected for further growth protocols. Strain A was cultivated in sugarcane molasses under different conditions—both with and without aeration (anaerobic and aerobic conditions). The fermentation processes were conducted in batch conditions for 24 hours at room temperature and at 30°C, with agitation at 150 rpm. Results demonstrated that aeration facilitated exponential growth, with the aerated culture producing up to 60g/L of yeast cell mass, compared to 20-25g/L without aeration, using 500g/L of raw molasses for both conditions. This suggests variations in the oxygen sensitivity among commercial yeast strains. Furthermore, this study aimed to optimize the conditions for maximizing yeast cell mass yield during batch fermentation using sugarcane molasses targeting baker's yeast, specifically the Saccharomyces cerevisiae strain. The study evaluated and optimized the incubation period, incubation temperature, aeration, nitrogen and phosphorus sources, and molasses concentration to enhance the yield of yeast cell mass.

Keywords: sugarcane molasses, Saccharomyces cerevisiae, Aerobic Culture Conditions, Yeast Cell Mass Yield, Fermentation efficiency, commercial baker's Yeast.

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Identification and characterization of Antimycobacterial compound from Piper nigrum

Kamal Kishor Rajak[1], Odedara Mitalben Bhikhabhai[2], Sanheeta Chakrabarty[3], Shreyans K. Jain[4], Hemant Kumar[5]

[1,2,5] Department of Medical Laboratory Technology, Bapubhai Desaibhai Patel Institute of Paramedical Science (BDIPS), Charotar University of Science and Technology, CHARUSAT Campus, Changa-388421, Gujarat, India.

[3,4] Department of Pharmaceutical Engineering and Technology, Indian Institute of Technology, Banaras Hindu University, Varanasi-221005, Uttar Pradesh, India

Abstract

Piper nigrum, also known as black pepper, is being used for both culinary and medicinal purposes for centuries. Plethora of studies have focused on the major alkaloid piperine and few other compounds but the potential medicinal properties of many other bioactive compounds in the plant have yet to be fully understood. In this study, non-piperine compounds were isolated through Silica (silica gel G 100-200 mesh size) column fractionation and subjected to antimicrobial screening against various bacteria, including acid- fast mycobacteria. The fractions showed significant activity against mycobacterial species but not against gram-positive and gram- negative bacteria. The minimum inhibitory concentration (MIC) of active fractions and crude extract were determined using micro-broth dilution assay and compared with that of the control drug isoniazid (INH). The MIC values of the most active fraction (fraction 7) was found to be 125 µg/ml for Mycobacterium fortuitum (M. fortuitum) and 62.5 µg/ml for both Mycobacterium phlei (M. phlei) and Mycobacterium smegmatis (M. smegmatis) which were significantly lower in comparison to that of crude extract. The active fraction was analysed through Gas chromatography-mass spectrometry (GC-MS) to identify the potential compound/s. Three compounds were detected through GCMS 1. DMSO (RT: 3.66), 2. τ –muurolol (RT: 9.81), and 3. Piperine (RT 25.70 and 25.82). Thus, the current study draws a conclusion about the potential medicinal use of non-piperine compounds having anti-mycobacterial activity and supports target validation experiments further to ease drug optimization.

Keywords: Antibacterial activity, Column Chromatography, GC-MS analysis, P. nigrum.

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Decompositions associated with the Cartesian product of function algebras

D. R. Patel[1], H. S. Mehta[2], R. D. Mehta[3]

[1] Department of Mathematics, B V M Engineering College, Vallabh Vidyanagar 388120, India

[2,3] Department of Mathematics, Sardar Patel University, Vallabh Vidyanagar 388120, India

Abstract

Let A be a function algebra on a compact Hausdor space X. Decompositions of X can be associated with a function algebra A. This was studied by Hayashi in detail. Here we study it in a more general way. We study decompositions of X +Y for the Cartesian product A x B of function algebras A and B.

Keywords: Function algebra, Decomposition, Cartesian product. cerevisiae, Aerobic Culture Conditions, Yeast Cell Mass Yield, Fermentation efficiency, commercial baker's Yeast.

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Planning Proposal of Road Infrastructure Development for Vapi – Silvassa Corridor

Bhargav Patel[1], Jagruti Shah[2],Prof.(Dr.) Indrajit Patel[3]

[1] PG Scholar, Infrastructure Engineering and Technology, B.V.M Engineering College, Vallabh Vidyanagar, Gujarat, India

[2] Assistant Professor, Department of Structure Engineering, B.V.M Engineering College, Vallabh Vidyanagar, Gujarat, India

[3]Professor, Department of Structural Engineering, BVM Engineering College, Vallabh Vidyanagar Anand (Gujarat), India

Abstract

India is quickly becoming a powerful economic force in the world, supporting urban growth by attracting investment and development from other nations. Thus, while the economy may have grown as a result of urbanization, its effects are now being felt in many of the main cities, which are dealing with problems with air quality, traffic congestion, increased accident rates, the growth of slums, etc. Sustainable techniques are essential to addressing these issues while preserving the economy. India's urban population increased at a rate of around 32% over the previous ten years. The industrial city of Vapi & Silvassa is expanding quickly. 7.37 lakh people, including those who are floaters, make up the current population. Since the earliest major human settlements, traffic and urban communities have coexisted, compelling people to assemble in huge urban areas and resulting in the requirement for urban mobility. This report discusses Vapi & Silvassa's traffic characteristics, road network, and various vehicle growth and composition while keeping in mind the current situation. Additionally, give the roads amenities like marking, roadside vegetation, signboards, etc. This research focuses on public transport planning for Silvassa City and Vapi GIDC's holistic strategy to ensuring higher levels of civic service. This study sheds some light on the public transportation design factors that public transit chose, such as road length, traffic composition, and trip purpose trip length. This thesis examines a planning proposal for the construction of road infrastructure along the Vapi-Silvassa Corridor.

Keywords: Easy Mobility, Sustainable Transportation, Road Infrastructure

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A computational study of the treatment for colorectal cancer using Alangium salviifolium

Avani Shah[1], Pratiksha Gondkar[2], Khushal Patel[3], and Digvijaysinh Rana[4]

[1] Ashok and Rita Patel Institute of Integrated Study and Research in Biotechnology and Allied Sciences, New Vallabh Vidyanagar-388121, Gujarat, India.

[2,3] Bapubhai Desaibhai Patel Institute of Paramedical Sciences, CHARUSAT, Changa-388421, Gujarat, India

[4] Birsa Munda Tribal University, Rajpipla - 393145, Gujarat, India

Abstract

The number of side effects associated with commercially available cancer medications is increasing, and natural products are being used to reduce these effects. Alangium salviifolium was used in this study because of its constituents. Plants contain alkaloids called beta-carboline harmaline and deoxytubulosine, which have anticancer properties. The anticancer activity of the alkaloids was investigated using CADD, a computationally based design method. Using the NPACT database, the compounds' anticancer qualities were investigated, and the Auto Dock program was used to conduct a binding affinity study with six distinct receptors. The results were displayed in Discovery Studio. The widely used commercial medication Paclitaxel was used to assess these outcomes. Zinc oxide was added to the compounds to provide additional benefits. Following modification, Discovery Studio was used to visualise the results of the molecular docking study using the PyRx software. The pharmacokinetics study using the pkCSM database needs in-vitro validation of Beta-carboline harmaline.

Keywords: Cancer, Colorectal, Alangium salviifolium, Bioinformatics.

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Risk Assessment of Tebuconazole on Okra

Khushal Patel[1], Riddhi Solanki[2], Zeel Patel[3], Shivangi Soni[4], Nisha Daxini[5]

[1,2,3] Department of Medical Laboratory Technology, Bapubhai Desaibhai Patel Institute of Paramedical Sciences (BDIPS), Charotar University of Science & Technology (CHARUSAT), Changa, Anand, Gujarat- India- 388421

[4,5] Ashok and Rita Patel Institute of Integrated Study and Research in Biotechnology and Allied Sciences (ARIBAS), The CVM University, Vallabh Vidyanagar, Gujarat, India-388120

Abstract

The study aimed to assess the dissipation kinetics of Tebuconazole residues on Okra under field conditions to ensure consumer safety. Tebuconazole was applied via spraying method onto Okra, and samples were collected at various intervals: 0 days (1 hour), 3 days, 5 days, and 8 days post-application. The initial average deposits of Tebuconazole on Okra ranged from 24 ppm to approximately 2 ppm. The observed half-life of Tebuconazole ranged between 48 to 72 hours. The Theoretical Maximum Residue Contribution (TMRC) for Tebuconazole was calculated and found to be significantly below the Maximum Permissible Intake (MPI) on Okra, specifically on the 8th day following the application of Tebuconazole. Consequently, it was determined that Okra did not present any discernible human health risks after exposure to the fungicide.

Keywords: Okra, Pesticides, tebuconazole, HPLC

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Chargers for Solar & E-Vehicles

Hitarth Solanki[1], Tarang Patel[2], Chintan Bamania[3], Dr. Vithal Kamat[4], Prof. Dharita Patel[5]

[1,2,3] Ex Student, Electrical Engineering Department, Birla Vishvakarma Mahavidyalaya, Vallabh Vidyanagar, Gujarat

[4] Managing Director, Baroda Electric Meters Pvt Ltd., GIDC, Vitthal Udyognagar, Gujarat

[5] Assistant Professor, Electrical Engineering Department, Birla Vishvakarma Mahavidyalaya, Vallabh Vidyanagar, Gujarat

Abstract

In view of the diminishing non-renewable energy sources such as coal and diesel, renewable energy sources have turned out to be a necessity for the future. These renewable sources include wind energy, solar energy, hydro-power, tidal energy and biomass, with solar energy being the most comprehensible, directly sourced from the sun. Photovoltaic cells convert solar energy to electrical energy, and this energy is stored in batteries for consumption during the dark hours. Solar-powered equipment and applications are in in height request, and in order to charge batteries, solar charge controllers are utilized. However, traditional charge controllers employing the PWM technique are incompetent and can cause destruction to the batteries. To augment the performance of solar charge controllers, MPPT-based systems are used to transfer maximum power from solar panels to batteries. This paper proposes a use of a microcontroller-based system to safeguard a constant output from the solar panel under fluctuating environmental conditions. On the other hand, the use of an AC to DC charger as a reliable backup option for a solar MPPT charge controller is also considered. The AC to DC charger can come in accessible situations where there is insufficient sunlight to charge the battery or in cases of emergencies where the solar panels are not available.

Keywords: component; formatting; style; styling; insert (key words)

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A Sustainable Approach for Pollution-Free Mobility: Green Airport

Jagruti Kautkar[1], Jagruti Shah[2], Prof. (Dr.) Indrajit Patel[3]

[1] Infrastructure Engineering and Technology, B.V.M Engineering College, Vallabh Vidyanagar, Gujarat, India

[2] Assistant Professor, Department of Structure Engineering, B.V.M Engineering College, Vallabh Vidyanagar, Gujarat, India

[3] Professor, Department of Structural Engineering, BVM Engineering College, Vallabh Vidyanagar Anand (Gujarat), India

Abstract

The aviation industry is one of the most important industries. The aviation sector provides the global transportation network, making it essential for global business and tourism. It plays an important role in economic growth and poverty alleviation. The aviation industry is expanding rapidly and will continue to grow in the future. According to ICAO estimates, air traffic will increase by an average of 4.3% per year over the next 20 years. One of the most important areas of activity in the aviation sector is airport management. Airports are critical nodes in the transportation system and also in territorial connectivity. Airports provide airline services, passenger transportation, and freight transportation. Although the airport's positive impacts are taken into account, airport operations have various impacts on local communities and the natural environment. Airport activities can negatively impact the environmental quality of the surrounding area. This paper aims to propose a solution for designing green airport infrastructure. Eleven key elements that are crucial for developing green airports have been chosen as the paper's core criteria in order to achieve its goal. Through the use of a questionnaire survey form, responses from 61 respondents were gathered, and an analysis was performed. Utilizing sustainable airport construction techniques while planning, constructing, running, and monitoring can help protect the environment and lower pollution.

Keywords: Green airport, Sustainable, Air transport.

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Automated Classroom Attendance System Using Image Processing

Dr Zankhana Shah[1], Komal Vaswani[2], Smit Patel[3], Devanggiri Goswami[4], Dhruv Purohit[5]

[1] Department of Information Technology, Assistant Professor in Birla Vishwakarma Mahavidyalaya,

[2,3,4,5] Department of Information Technology, Birla Vishwakarma Mahavidyalaya, Anand, Gujarat, India

Abstract

In response to the persistent challenges of manual attendance tracking in educational settings, this research introduces the "Automated Classroom Attendance System Using Image Processing." Leveraging advanced image processing and facial recognition technologies, the system offers a streamlined approach to attendance recording. By capturing real-time images of students through a user-friendly mobile application, the system employs a combination of OpenCV and deep learning models for facial feature extraction and recognition. Results from extensive testing reveal a high accuracy rate and significant efficiency gains compared to traditional methods. User feedback underscores the system's non-intrusive nature and positive impact on the teaching environment. Privacy and security considerations are prioritized, aligning the system with regulatory standards. As a comprehensive solution, this research not only addresses current challenges in attendance tracking but also establishes a foundation for future advancements in educational technology.

Keywords: Image Processing, Facial Recognition, Attendance Tracking

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Real-Time Cartoonization: Fusion of Computer Vision and Artistic Rendering in Python

Duttresh Sapra[1], Aadityasinh Jadeja[2], Bhavin Vhanesha[3], Dr. Zankhana Shah[4]

[1] Student at IT Department, BVM Engineering College, V.V. Nagar, India.

[2] Student at IT Department, BVM Engineering College, V.V. Nagar, India.

[3] Student at IT Department, BVM Engineering College, V.V. Nagar, India.

[4] Assistant Professor at BVM Engineering College, V. V. Nagar, India.

Abstract

This project endeavors to develop a real-time cartoonization application leveraging the capabilities of Python libraries such as OpenCV and tkinter. The primary objective is to design and implement a functional pipeline for live image processing. The process includes the acquisition of live camera feed, facial detection algorithms, and the application of cartoonization filters to enhance the visual appearance of detected faces. This paper offers a comprehensive overview of the methodology employed, the technical implementation details, the observed results, and the derived conclusions derived from the developmental stages of this real-time cartoonization prototype.

Keywords: Real-time cartoonization; Facial detection; Image processing.

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Impact of High Protein Diet and Resistance Training Intervention on Anthropometry and Body Composition of Middle Age Women of Ajpipla, Gujarat

Dr. Bhavana Chauhan[1], Ms. Pragna Pandav[2]

[1] Principal, S. M. Patel College of Home Science, Sardar Patel University, Vallabh Vidyanagar

[2] School of Continuing Education, Indira Gandhi National Open University (IGNOU), New Delhi – 10068

Abstract

The prevalence of Overweight and Obesity is increasing among middle-aged women Overweight women look forward to various ways of losing weight. Some of these methods can put women at a danger of losing muscle mass quickly than fat. Preserving muscle mass is crucial for maintaining metabolic health. A weight reduction approach that combines sufficient protein intake with resistance training (RT) proves effective in preserving muscle mass. This study aims to illustrate the impact of a high-protein diet combined with resistance training on the anthropometry and body composition of middle-aged women after a 4-week intervention. The collected data was analyzed using percentages and chi-square tests, and the findings are presented through tables and graphs. Both groups exhibited a significant positive influence on anthropometric measurements. Whether incorporating normal or high protein, resistance training appears to positively affect weight loss, body composition changes, and anthropometric measurements. However, a normal protein diet shows adverse effects on body composition changes. This research holds value for researchers, adolescents, and middle-aged women seeking insights into the significance of adopting a high-protein diet and engaging in physical activity to maintain optimal health.

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Sustainability and Urban Development: An In-depth Study of Self-Sustainable Integrated Townships for Rajkot

Sohil badi[1], Jagruti Shah[2], Prof.(Dr.) Indrajit Patel

[1] Infrastructure Engineering and Technology, B.V.M Engineering College, Vallabh Vidyanagar, Gujarat, India

[2] Assistant Professor, Department of Structure Engineering, B.V.M Engineering College, Vallabh Vidyanagar, Gujarat, India

[3] Professor, Department of Structural Engineering, BVM Engineering College, Vallabh Vidyanagar Anand (Gujarat), India

Abstract

The rapid urbanization driven by population growth and migration has heightened the demand for innovative urban planning and sustainable development. Over the past two decades, Rajkot has faced escalating infrastructure, environmental, and social challenges due to population migration. To tackle these issues, this research proposes establishing a Self-Sustainable Integrated Township within Rajkot. This visionary township integrates advanced technologies, green infrastructure, and community-driven initiatives, emphasizing eco-friendly architecture, energy efficiency, waste management, renewable energy, smart transportation, water conservation, and affordability. This study assesses the potential benefits and challenges of implementing the Self-Sustainable Integrated Township concept, considering Rajkot's unique characteristics. Through extensive data analysis and case studies, it evaluates the environmental, economic, and social impacts. The findings suggest that this township can reduce Rajkot's carbon footprint, enhance resource management, and improve residents' quality of life. Furthermore, by incorporating smart technologies and sustainable practices, it can attract investments, driving economic growth and setting a precedent for other rapidly expanding cities. Ultimately, the township's primary goal is to divert city migration, offering affordable housing, safety, a sustainable environment, and reducing the social impact on Rajkot. This initiative provides a path for Rajkot's sustainable development and could serve as a blueprint for other rapidly growing cities, fostering a greener, more resilient, affordable, and socially inclusive future

Keywords: Self-Sustainable, Integrated Township, Affordability Township Planning.

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Role of Women in Water Resource Management: A Review

Prof. Vandana P.Pandya[1], Prof.Namira saiyed[2]

[1] HOD and Assistant professor at Parul Institute of Engineering & Technology(DS),Limda,Vadodara

[2] Assistant Professor at Parul Institute of Engineering & Technology(DS),Limda,Vadodara

Abstract

Water resource management is a critical global challenge. In this paper, we explore the evolving role of women in water resource management and address the emerging issues they face. It is essential to recognize the vital contributions of women and to address the gender-specific challenges they encounter in this sector. Water management in the Gujarat region has been a critical area of focus due to its arid climate and water scarcity issues. Over the years, women have played a significant role in addressing these challenges through various sustainable practices and initiatives. This paper provides an overview of women's contributions to water management in the Gujarat region, highlighting their vital roles in ensuring water conservation, distribution, and sustainability.

Keywords: Water resource management, contributions of women, scarcity issues, vital roles

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Bis and mono halide bismuth (III) O,O'-ditolyl dithiophosphates

Seema Maheshwari[1]

[1] Department of Chemistry, Mahila Engineering College, Ajmer 305001

Abstract

Bis and mono halide bismuth(III) O,O'-ditolyl dithiophosphate complexes of the type [Bi{S2P(OR)2}nCl3-n] (where R = o-, m-, p-C6H4Me; n = 1-2) were synthesized by the reactions of Bismuth(III) chloride with ammonium ditolyldithiophosphasphates in 1:2 and 1:1 stoichiometric ratio. These novel complexes were characterized by elemental analysis, IR, 1H NMR and 31P NMR spectroscopy. On the basis of comparison with the earlier reported literatutre distorted trigonal bipyramidal geometry (tbp) may be proposed for the complexes corresponds to [(o-, m- or p-MeC6H4O)2PS2BiCl2] while an octahedral geometry for the complexes [{(o-,m- or p-MeC6H4O)2PS2}2BiCl].

Keywords: Bis and mono halide, Bismuth Complexes, Dithiophosphates

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Intersectional Challenges Faced by Disabled Women: A Comprehensive Analysis of Societal, Economic, and Legal Perspectives

Dr.Mitsu Acharya[1]

[1] Asst. Prof. & TPO at C.K.Shah institute of Management

Abstract

People with disabilities face many hurdles in their fight for inclusion and equality. Although, both men and women with disabilities are subjected to discrimination, it is the latter who are at a further disadvantage. Women with disabilities face "double discrimination" given that these women are subjected to not just disability limitations but also gender oppression. The paper explores the issues pertaining to women with disabilities in India. Drawing from the existing literature and statistics the article attempts to highlight the barriers faced by disabled women in India. It describes the abuse, violence, unemployment, discrimination, exclusion and other obstacles that these women face given their gender and disability. Based on this analysis the necessary conclusions are drawn Addressing the issues faced by disabled women requires a multifaceted approach that encompasses social, economic, and political considerations. Research papers on this topic should delve into various aspects that affect disabled women, including societal attitudes, healthcare access, employment opportunities, education, legal rights, and intersectionality between gender and disability. This paper is conceptual in nature.

Keywords: Women with disabilities, higher education, accessibility, challenges, overcoming strategies, Caste; gender; disability; Indian economy; development programmes; NGO

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Degradation of RB5 using Graphene Materials

Rocky Desai[1], Dr. Snehal popli[2], Shailesh Pal[3], Krunali Patel[4]

[1] PhD Scholar, Civil Engineering Department C.V.M University, V.V. Nagar, India

[2] Assistant Professor & Head Civil Engineering Department, G. H. Patel College of Engineering & Technology, V.V. Nagar, Gujrat,India

[3] PhD Scholar, Civil Engineering Department C.V.M University, V.V. Nagar, India

[4] PhD Scholar, Civil Engineering Department C.V.M University, V.V. Nagar, India

Abstract

Water is very essential part of the human life as it suffice the various needs of human activities. Due chemical industry sector rise, the effluent generated from the chemical industry is become imperative to treat. Graphene based adsorption process is a economical & advance treatment to treat the chemical industrial wastewater. Due to the modernization a higher stabilized dye effluent is very difficult to treat with the conventional biological treatment. Also chemical treatment generates huge quantity of sludge, which increases the pollution load. Graphene based material is very innovative technique to remove the dye from the effluent. This research paper investigates the removal of the Reactive Black – 5 (RB5) dye from the synthetic wastewater. The various operational parameters were studied such as dye concentration, graphene dose & time. It gives the highest dey removal were obtain of 99.20% with using the 0.5 mg/L graphne by providing the reaction time of 01 hour & dye concentration was 50 ppm.

Keywords: Reactive Black – 5 (RB5, Graphene, dy)

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A critical review study on climate change estimation models to reduce the future risks

Jagruti Shah[1], Dr. Rajiv Bhatt, Prof.(Dr.) Indrajit Patel

[1] Research Scholar, CVM University, Vallabh Vidyanagar, Gujarat, India

[2] Associate Professor, A.D. Patel Institute of Technology, CVM University, New Vallabh Vidyanagar, Gujarat, India

[3] Professor, Department of Structural Engineering, BVM Engineering College, Vallabh Vidyanagar Anand (Gujarat), India

Abstract

Modern industrialization and urbanization have contributed significantly to variations in the global climate. These factors can also alter the hydrological conditions of ecosystems, making human society and its surrounds more vulnerable. Planning the support systems for urban cities therefore requires a thorough risk analysis of climate change. Earlier, the majority of the recent literature failed to validate the risk level of climate variation on an urban scale, instead concentrating on the effect of global variation. Climate change risk analysis in urban systems has therefore proven to be extremely difficult. This article, which considers the urban planning support system under climate change risk analysis, aims to provide a possible literature review on the subject. The evaluation of this paper is divided into several research areas, including urban planning, performance analysis with regard to the calculation of risk for the urban area. Using this as a foundation, the analysis reviews the most important issue to be resolved in order to mitigate the impact of climate change on the urban planning system and summarizes the effective research advances. This allows for the current numerical estimation of the urban system cl to be included in guidelines for the future.

Keywords: Climate change, Ecosystem, Risk, Urbanization

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GANs in crafting Visual Realms: A Comprehensive Examination of Image Synthesis Applications

Bhavesh A. Tanawala[1], Dr. Darshankumar C. Dalwadi[2], Palak K. Patel[3]
[1] Research scholar, Gujarat Technological University, India,
[2] Associate Professor, BVM Engineering College, India
[3] Research Scholar, Gujarat Technological University, India

Abstract

Purpose of analysis with the unique development of data accumulation and deep learning algorithms, artificial intelligence (AI) and machine learning (ML) are dignified to transform the practice of many areas like Medical, Self-driving cars, Product recommendations, Virtual Personal Assistant, Image recognition, etc. Deep learning methodologies have been advanced rapidly and achieved great success in computer vision and Natural Language processing. Generative adversarial networks (GANs) are an tactic to procreative beading using Deep Learning. As part of reviewing paper, we determination to make available a condemnation on countless GANs enactments from the observations of developments and solicitations. Primarily, we will have an inkling of Propagative Models, Striding over Supervised and Unsupervised Learning archetypes and discriminator and generative modeling. Additionally, GANs have collaborated with other machine learning approaches for specific purposes, such as semi-supervised learning, transfer learning, and reinforcement learning. Secondly, emblematic requests Examples are provided to illustrate the applications of GANs in appearance processing and computer vision, natural language processing, speech, music, audio and video analysis, the medical field, and data science. Also investigation conclude the latent of the different arrangements through qualitative and measureable assessment of the generated samples.

Keywords: GAN (Generative Adversarial Network), DNN (Deep Neural Network), AI (Artificial intelligence), MSE (Mean Square Error), SRGAN(Super Resolution GAN), DC-GAN (Deep Convolution GAN)

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Home Automation using Mitsubishi GOC35 PLC

Dr. Kaushika D. Patel[1], Dr. Darshankumar C. Dalwadi[2], Dr. Rakesh D. Patel[3]
[1] Assi. Professor, BVM Engineering College, Vallabh Vidyanagar,
[2] Asso. Professor, BVM Engineering College, Vallabh Vidyanagar,
[3] Head, Mechanical Engineering Depatment, B and B Institute of Technology, Vallabh Vidyanagar

Abstract

A smart home or smart house is a home that has been automated, often known as home automation or demotic. Lighting, climate, entertainment systems, and appliances are just a few examples of the house features that a home automation system may monitor and/or regulate. ABI Research estimates that 1.5 million home automation systems were deployed in the US by 2012. By the end of 2018, more than 45 million smart home gadgets will be deployed in American households, predicts research firm Statista. Systems have traditionally been provided as complete systems, which depend on a single vendor to supply the hardware, communications protocol, central hub, and user interface. Open hardware and open-source software are now alternatives to or complements of proprietary hardware, respectively. These systems frequently connect to common consumer devices like the Arduino or Raspberry Pi, which are available online and in the majority of electronics retailers. Additionally, Bluetooth is being used more frequently by home automation devices to connect with mobile phones, giving users more affordable and customizable options. Home automation systems are very popular right now, both in homes and in businesses. For example, middle class families find it difficult to install this kind of system because of the expensive cost of it. Therefore, our project offers solutions to this kind of issue. We are employing the affordable and dependable Mitsubishi GOC35 PLC in our project. We developed a web application that we use to regulate home appliances.

Keywords: Mitsubishi GOC35, PLC, Automation, Software Algorithm, Ethernet.

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Smart Traffic Control Based on Vehicle Counting and Emergency Vehicle Detection

Mr. Gulamhussain Y. Malik[1], Dr. Krunal Patel[2], Dr. Miral Patel[3]

[1] M.E. Student, IT Department, G.H Patel College of Engineering and Technology, CVM University, Vallabh Vidhyanagr

[2,3] Associate Professor, IT Department, G.H Patel College of Engineering and Technology, CVM University, Vallabh Vidhyanagr

Abstract

Managing traffic control is one of the most difficult tasks in today's globe. When emergency vehicles, such as an ambulance, become stuck in traffic, they face numerous problems, and many lives are lost as a result of bad traffic management. In this study, I proposed a method for calculating the amount of traffic on roads by using procedures for images with ambulance detection systems using YOLO, counting vehicles to determine the amount of traffic, categorizing vehicles based on features extracted from images, and controlling model for traffic signals using information extracted from images of vehicles on roads taken by webcam. When an emergency vehicle is discovered in that area, the suggested system counts the vehicles in the path and looks for emergency vehicles.

Keywords: CNN, YOLO, OpenCV, VGG-16, Image Processing, COCO dataset

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Deep Learning Approaches for Image Restoration Comprehensive Survey

Rikita Chokshi[1], Dr. Sudhir Vegad[2]

[1] Assistant Professor, Computer Engineering,CSPIT, CHARUSAT,Changa, India

[2] Professor, Information Technology Department, MBIT, CVM University, Anand, India

Abstract

This review offers a thorough analysis of the literature on the use of deep learning methods in image restoration. Deep neural network capabilities have spurred substantial breakthroughs in image restoration, which includes tasks like dehazing, denoising, super resolution, and deblurring. Focusing on the development of Convolutional Neural Networks (CNNs), Generative Adversarial Networks (GANs), and other deep learning architectures, the paper methodically looks at significant contributions, techniques, and trends across a range of picture restoration problems. To get state-of-the-art outcomes, we explore the subtleties of network designs, training approaches, and data augmentation methodologies. We explore the intricacies of network architectures, training methodologies, and data augmentation tactics that have been essential in attaining cutting-edge outcomes. In addition, this literature analysis opens the door for further research by shedding light on the difficulties and unanswered problems in the field. This publication provides a thorough resource for scholars, practitioners, and hobbyists interested in deep learning-based picture restoration, by combining results from several investigations.

Keywords: Deep Learning, Deblurring, Neural Network Architectures, Image Restoration, Training Strategies, State-of-the-Art, Image Quality Enhancement

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Sentiment Analysis of social media using NLP for Smart Governance in Smart Cities

Krish Kalyani[1], Vatsal Makodia[2], Dr. Bhargav Goradiya[3], Amisha Sakhare[4]
[1,2,3,4]Birla Vishvakarma Mahavidyalaya Engineering College

Abstract

In recent past the use of social media has been increased multifold and the use of social media is not only limited for showing or highlighting the updates of individual or organizations but it can also be used as very important tool for identifying the sentiments of citizens. Here we are proposing the Smart Governance using sentiment analysis of social media (particularly emphasizing on X (formerly known as twitter) using Natural Language Processing. The result of sentiment analysis can be used to enhance the facilities, resources and also very useful for taking corrective measures by the government authorities. This is going to be futuristic need for almost all the decision making authorities for the citizen centric and inclusive growth of the cities or smart cities.

Keywords: Sentiment Analysis, Smart City, Smart Governance, Twitter, Natural Language Processing, Citizen Centric Governance, social media

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Advanced Reconfigurable Bandpass Filter Design for Wireless Applications at 2.4 GHz and 3.6 GHz Frequencies

Khyati Chavda[1], Dr A K Sarvaiya[2]
[1] Reserach scholar, GTU, Shantilal Shah Engineering College, Gujrat, India
[2] Assistant Professor, GEC Bahvnagar

Abstract

This research paper focuses on the design and development of a compact microstrip bandpass filter using folded open loop split ring resonators for 4G and 5G applications. It introduce a reconfigurable bandpass filter using PIN diode technology to enable dynamic frequency selection between 2.4 GHz and 3.6 GHz. The paper introduces microstrip bandpass filters and their importance in microwave and wireless communication systems. The proposed filter design utilizes folded resonators to eliminate harmonics and achieve sharper cut-off frequencies. The measured results closely align with the simulations result.ural Network Architectures, Image Restoration, Training Strategies, State-of-the-Art, Image Quality Enhancement

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3D Bioprinting: An Emerging Technology

Dhyana Soni[1], Mit N Swadas[2]

[1,2] Student of department of Computer Engineering, G H Patel College of Engineering & Technology(CVMU), Vallabh Vidyanagar, Gujarat, India

Abstract

3D printing is revolutionizing technology; with the use of specialized 3D printers we can accomplish construction of complex structures. 3-D printing technology has the potential to revolutionize medicinal activities by enabling the production of person specific and cell type specific tissues and organs for transplantation, for carrying various pharmaceutical research activities, and for research activities in tissue engineering. The field of 3D bioprinting is expected to play a significant role in healthcare in the future because of the rapid expansion of potential applications made possible by advancements in processes, materials, and software. This paper overviews the need of 3D bioprinting in current era of science and technology, process of pre-printing, printing, and post-printing phase of bioprinting, different bioprinting mechanisms and types like Inkjet based bioprinting, Extrusion based bioprinting, and Laser assisted bioprinting, the specific type of material needed for bioprinting which is a bioink and its different types are also taken up. Few of the AI techniques to optimize bioprinting, applications of bioprinting in various fields, the current advancement and current bioprinting trends in bioprinting and challenges and limitations of this bioprinting are also discussed.

Keywords: 3D Printing, 3D Bioprinting, Bioink, Hydrogel

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Advanced Reconfigurable Bandpass Filter Design for Wireless Applications at 2.4 GHz and 3.6 GHz Frequencies

Khyati Chavda[1], Dr A K Sarvaiya[2]

[1] Reserach scholar, GTU, Shantilal Shah Engineering College, Gujrat, India

[2] Assistant Professor, GEC Bahvnagar

Abstract

This research paper focuses on the design and development of a compact microstrip bandpass filter using folded open loop split ring resonators for 4G and 5G applications. It introduce a reconfigurable bandpass filter using PIN diode technology to enable dynamic frequency selection between 2.4 GHz and 3.6 GHz. The paper introduces microstrip bandpass filters and their importance in microwave and wireless communication systems. The proposed filter design utilizes folded resonators to eliminate harmonics and achieve sharper cut-off frequencies. The measured results closely align with the simulations result.ural Network Architectures, Image Restoration, Training Strategies, State-of-the-Art, Image Quality Enhancement

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Role of Blockchain in automation of trending industrial technologies

Anand Patel[1], Miral Patel[2]

[1] Department of Information Technology, Faculty of Technology and Engineering, Dharmsinh Desai University, Nadiad, India

[2] Department of Information Technology, G H.Patel college of engineering and technology, CVM University, Vallabh Vidyanagar, Anand, Gujarat, India

Abstract

The distributed ledger aspect of blockchain technology has transformed traditional trade; each record in this ledger is protected by cryptographic rules, making it more secure and tamper-proof, and the technology is currently attracting more and more attention. Despite warnings of blockchain's doom, the technology has made tremendous strides and introduced game-changing innovations to the world of digital currency and transactions. Internet of Things (IoT), cloud computing, machine learning, adaptive robotics, cyber physical systems, artificial intelligence (AI), Industrial Integration (II), and Service Oriented Computing are some of the emerging technologies that support Industry 4.0. The majority of industrial data management systems are centralized and do not provide the capabilities necessary to guarantee trustworthy data provenance, immutability, transparency, auditability, or traceability. A new and potentially game-changing technology, blockchain promises to decentralize and secure all data and transactions without the need for a trusted third party, all while providing trustworthy traceability, transparency, auditability, and immutability. To lay the groundwork for presenting and showing the usage of Blockchain technology in the 4th industrial era, this paper is an endeavour. In this article, we go into key ideas behind industry 4.0 and how blockchain technology may be used to its advantage. We investigate many potential applications of blockchain technology to promote the growth of Industry 4.0.

Keywords: Blockchain Technology, Industry 4.0, immutability, transparency, ledger technology)

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Multimodal Sentiment Analysis: Comparision of State-of-the-Art Fusion Techniques

Ankita Gandhi[1], Dr Kinjal Adhvaryu[2]

[1]Sardar Vallabhbhai Global University

[2]Shankersinh Vaghela Bapu Institute of Technology

Abstract

In today's digital landscape, the prolific expression of opinions across diverse online platforms necessitates robust sentiment analysis techniques. This evolving field crucially interprets sentiments conveyed in shared views and opinions, playing a pivotal role in understanding public perspectives on various subjects. However, the majority of research has predominantly focused on text data only, overlooking the potential wealth of information in other modalities. Building on the burgeoning field of language understanding, which merges AI, natural language processing, and cognitive science, this study delves into multimodal sentiment analysis, fusing verbal and non-verbal cues for speaker intent inference. We conduct an extensive empirical evaluation comparing seven state-of-the-art multimodal fusion techniques. Our evaluation leverages two benchmark corpora—CMU-MOSI, CMU-MOSEI—to discern the efficacy and efficiency of these fusion approaches. This evaluation spans diverse neural network architectures, employing attention, memory, and recurrent components across multimodal sentiment analysis task.

Keywords: Multimodal Interaction, Affective Computing, Multimodal Fusion, Video Sentiment Analysis

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Performance analysis of Rice Grains Using Neural Network

Ami H Bhensjaliya[1], Dr. Darshankumar C. Dalwadi[2]
[1]Research Scholar, Gujarat Technological University
[2]Associate Professor, Birla vishvakarma Mahavidyalya vallabh vidyanagar.

Abstract

The paddy is the main food for human in the world. It's contains various food quality are fiber, vitamin, minerals, protein. In the production of paddy India is second country. Basically paddy is grains are defined by its own features like shape, size, area, etc. The image processing technique is helpful to extract the features and classify the paddy grains. In this paper, we have applied the Convolution neural network algorithm to improve the performance of the system.

Keywords: Paddy (Rice) Grains, Image processing, Classification of grain, Segmentation, Neural network.

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Speech-Based Recognition of Gujarati Numerals Using Supervised Learning

Yagneshkumar Mangroliya
Dharmsinh Desai University

Abstract

In the realm of computer science, the significance of speech synthesis and speech recognition has surged, particularly in enhancing computers' comprehension of human speech, notably in languages such as English. This paper delves into a specialized model tailored to identify spoken Gujarati numerals. By capitalizing on the efficacy of Mel-Frequency Cepstral Coefficients (MFCC) as fundamental features, and harnessing the classification prowess of Support Vector Machine (SVM) and Random Forest algorithms, our proposed model achieves commendable results. With an average accuracy rate of approximately 87% using SVM and 88.40% using Random Forest, our model adeptly demonstrates its proficiency in accurately discerning spoken Gujarati numerals ranging from 0 to 20. This study substantially contributes to the advancement of spoken language processing in under-explored linguistic contexts.

Keywords: speech recognition, MFCC, spoken Gujarati numeral, Supervised Learning, SVM.

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Research Challenges for Drones

Sarika Pardhi[1], Vandan Parmar[2], Dipti Rana[3]
[1,2] Student, Sardar Vallabhbhai National Institute Of Technology, Surat
[3] Assistant Prof., Sardar Vallabhbhai National Institute Of Technology, Surat

Abstract

Drones have become increasingly popular in recent years due to their wide range of applications in agriculture, security, delivery, firefighting, traffic monitoring, and more. The use of multiple drones can make these applications more efficient, saving time and energy resources. One of the most important functions that drones must perform is to travel safely from point A to point B without colliding with other objects and as efficiently as possible. This problem is known as the Path Planning Problem. Extensive research has been conducted in path planning for UAVs, and numerous algorithms have been developed to tackle this problem. In this research, we present a literature review of path planning methods for multi drones. We compare the methods used for path planning and identify their strengths and weaknesses. Based on this comparison, we propose a solution for path planning for multi drones. Our suggested method is predicated on the division of the area according to the number of drones, followed by the use of the parallel line technique once each drone has been assigned to a region. We believe that our proposed solution will provide an effective approach to path planning for multi drones.

Keywords: Drones, Path Planning, Multi-Drones, UAV, Parallel Line Technique, Area Division

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Overcoming Transgressive Divides: Women in the Web of Technology

Leanora Pereira
St. Xavier's College

Abstract

Discrimination affects a Woman's tomorrow. Will in continue in the twenty-first century?
Discrimination and Prejudices remains a fundamental problem in many societies even today. Based on surveys and reports, it is now accepted that discriminatory norms in social behaviour remains dominant even in advanced societies. In developing and underdeveloped countries discrimination in Education was confined to the male sex. But the use of technology cannot be contained. It is widespread and available to all. But does technology and the use of computers signify a new tomorrow for the Indian woman? Will computing help women overcome social exclusion? In India, like many Asian and African countries where the patriarchal system has predominated for centuries, women have begun standing up for their rights to equality. As this right to Education for women is being granted, more and more of women are getting technologically savvy the digital divides also narrow.This study investigates the implications of the computer age on women. This paper studies the impact of computers in education and work place. Will women continue to be empowered at a rate that they will soon be at the helm of the global information infrastructure?

Keywords: Digital Divide, Feminine Wizards, internet infrastructure, cultural changes

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Soil to Cloud "Advance Multilevel Farming through IoT Technology"

Paavan Shah[1], Dr. Bhargav Goradiya[2], Dhrumil Rupera[3], Siddhi Shah[4]
[1,2,3,4]Birla Vishvakarma Mahavidyalaya Engineering College

Abstract

This research paper introduces an innovative approach, to technology by focusing on the integration of the Internet of Things (IoT) in multilevel farming. The method described here applies to both farms and modern greenhouses utilizing a unique honeycomb structure. The main innovation lies in the integration of sensors and actuators which enable enhanced crop yields and efficient resource management. This system is particularly advantageous for crops such as beetroot, calabrese, kale, kohl rabi and Little Gem lettuce that thrive with sunlight. One notable aspect of this approach is the inclusion of a drip irrigation system that can be controlled remotely using smartphones. This feature allows for water management. The IoT technology utilized enables data collection at levels within the farm encompassing parameters like soil moisture, temperature and humidity. This collected data assists in making decisions regarding crop types watering schedules and fertilization requirements. The paper presents findings, from a series of experiments that demonstrate how this system optimizes water usage while enabling pest detection. It also showcases how it effectively manages irrigation and fertilization practices. Furthermore, it emphasizes how this technology has the potential to revolutionize farming practices by automating processes and providing real time insights. Ultimately these advancements lead to efficient agricultural practices. This research has implications that suggest a progress, towards a future, in agriculture that is both sustainable and productive.

Keywords: Multilevel farming; IoT; Irrigation; Water Management;Sensors;

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AllJoyn based Home Automation Control System through Cloud

Shreya Jarsani[1], Dr. Bhargav C. Goradiya[2], Dr. Darshankumar C. Dalwadi[3], Dr. Anish A. Vahora[4]
[1]Engineer, Bluekaktus (Royal Datamatics PVT LTD)
[2]Head,BVM Engineering College
[3]Associate Professor, BVM Engineering College
[4]Assistant Professor, BVM Engineering College

Abstract

The extravagant development in Internet of Things (IoT) has evolved the possibilities of assimilation of various technologies that have ability to transfer data over a very large network without human interaction. Home automation is the current outgrowing field. But most of the frameworks used are not too secure. It can work with or without internet too. But it lacked for remote connectivity. This paper overcomes this issue by editing the AllJoyn code with sensor connectivity and wrapper function for cloud and local communication. Here AWS (Amazon web service) connectivity has been demonstrated.

Keywords: AllJoyn, secure, Local network, AWS cloud

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Design and Simulation of impulse voltage generator

M.N.Sinha[1], Akshit Gandhi[2], Ranjeet Mundhava[3], Dhruv Padasumbiya[4], Parth Prajapati[5], Soni Helly[6]

[1] Assistant Professor,EE Department, Birla Vishvakarma Mahavidyalaya Engineering, College,VVNagar

[2] GACL, Assistant Engineer.,

[3] Sales Manager, Ceramic Industry,Morbi

[4] Sales Head(West Region)SONBOND Energy Pvt.Ltd

[5] R &D Electrical Engineer,Vanderland Industries Pvt.Ltd

[6] SONI HELLY,B.Tech.(Electrical),Final Year Student,BVM Engg.College,VVNagar

Abstract

This paper presents the design and development of 4-stage lightning impulse voltage generator. The circuit is developed for education purpose. The actual industrial impulse generator is costly depending upon capacity. We have developed small scale version of impulse voltage generator. The circuit is also simulated using MATLAB software to verify the results.

Keywords: Front resistance, Impulse voltage,MOSFET, Tail resistance.

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Gender-Specific Contributing Factors of Osteoporosis: A Comprehensive Study in Adults Aged 40-70 in Central Gujarat

Dr. Minal Chauhan[1], Dr.Patel V.H.[2] and Dr.Rema S[3]

[1] Assistant Professor, S.M.Patel College of Home Science, V.V.Nagar, Gujarat, India.

[2,3] Professor, P.G. Department of Home Science, Sardar Patel University, V.V.Nagar, Gujarat, India

Abstract

In osteoporosis, especially in older adults, reduced bone density and fragility are common. This comprehensive study aims to identify osteoporosis risk factors in Central Gujarat people aged 40–70. Methods: The study had 841 participants -470 women and 371 men. Standardized questionnaire is used to collect data on age, medical history, osteoporosis risk factors, and symptoms to determine the gender-risk association. Results: Females had more osteoporosis diseases and fractures than males. Significant gender differences were noted for osteoporosis risk, such as rheumatoid arthritis, thyroid illnesses, eating disorders, a family history of maternal hip fracture, and musculoskeletal symptoms were more common in the gender. Conclusion: Significant Gender differences in osteoporosis-associated risk factors are highlighted in the study. These findings emphasize the necessity of public health initiatives to combat osteoporosis.

Keywords: Osteoporosis, risk factors, gender, risk factors

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Ber Performance of Adaptive Modulation And Power Allocation for Mimo-Ofdm System

Milendrakumar M Solanki[1], M. S. Holia[2]
[1,2] Assistant Professor , EL Department, B.V.M Engineering College, VV Nagar,Gujarat,India

Abstract

Multiple Input Multiple Output (MIMO) Orthogonal frequency division multiplexing (OFDM) system can be improved with optimal power allocation. Adaptive modulation selection plays a major role due to the progressing variation of wireless channel condition. Utilization of a single modulation type is not efficient for all channel conditions. Therefore, an adaptive modulation selection algorithm is required for choosing the constellation of Quadrature amplitude modulation (QAM). In this paper, the bit error probability (BER) information at the receiver is used for realizing the proposed simple adaptive modulation selection scheme. In the receiver side the transmitted signal is detected with V-BLAST non-linear Zero forcing (ZF) approach. It reduces the computational complexity by enabling minimum number of iterations. Compared to the other modulation schemes minimum amount of computational resources and time are sufficient to select the modulation format. The selected modulation type is suitable for the present conditions of the channel. The performance measures such as BER, is calculated and compared with the existing approaches. By varying the numbers of transmitting antennas, the performance of proposed approach has been analyzed.

Keywords: Adaptive modulation, MIMO-OFDM, signal detection, power allocation, optimal power.

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Evolving Horizons: Horn Antennas, SIW Advancements for 5G and their Pivotal Role in Satellite Communication

Avinash Giri[1], Ananta Sood[2], Prof. Anita N. Bhatt[3]
[1,2,3] Electronics Engineering, Birla Vishvakarma Mahavidyalaya, Anand, India

Abstract

The evolution of satellite communication and 5G technology has brought significant advancements in antenna design and performance. This review paper delves into the multifaceted world of antenna technology, specifically focusing on Horn Antennas in satellite communication and Substrate Integrated Waveguide (SIW) Antennas in 5G applications. We explore the application of Horn Antennas in satellite communication, their benefits, and challenges. The main spotlight, however, is on SIW Antennas, highlighting their superior design, essential parameters, and the advantages that make them a preferred choice over traditional Horn Antennas. To exemplify the benefits of SIW Antennas, we closely examine the SIW H-Plane Horn Antenna, a compact marvel with increased gain designed for vehicular millimeter-wave communication. This paper aims to provide an insightful perspective on the prominence of SIW Antennas in modern communication technology and why they outshine traditional Horn Antennas.

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Flare Induced Transverse Oscillations of Coronal Loops and Propagating EUV Waves

Safna Banu K[1], Ram Ajor Maurya[2]
[1,2] Department of Physics, National Institute of Technology Calicut, Kozhikode-673601, India

Abstract

We study an X1.5 class solar flare observed from an active region NOAA 13006 on May 10, 2022. This flare was accompanied by other energetic activities such as the propagation of an Extreme Ultraviolet (EUV) wave, coronal loop oscillations, Coronal Mass Ejections (CMEs), etc. We analyze this event using high spatial and temporal resolution observations from the Atmospheric Imaging Assembly (AIA) on board the Solar Dynamics Observatory (SDO), Extreme-Ultraviolet Imager (EUVI) of the Solar Terrestrial Relations Observatory-Ahead (STEREO-A), and the Large Angle and Spectrometric Coronograph (LASCO) within the Solar and Heliospheric Observatory (SOHO) satellites. We found that the EUV waves are initiated at the start of the flare, i.e., they are driven by the solar flares. It consisted of both fast and slow wave components. These shock wave fronts create oscillations in the coronal bundle of loops. One of the loops studied further to estimate the oscillation parameters. This loop oscillated with a period of 5.3 minutes with a damping time of 14±1 minutes. After that, we evaluated the oscillated coronal loop length by combining observations from AIA/SDO and EUVI/STEREO-A. Then, we estimated the magnetic field strength as 68 G with the help of coronal seismology.

Keywords: Corona, Structures; Flares, Waves; Flares, Relation to Magnetic Field; Magnetic fields, Corona; Waves, Magnetohydrodynamic; Waves, EUV Waves; Waves, Shocks

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Comparative Analysis of Deep Learning and Machine Learning Algorithms for Stock Price Prediction

Dip Modi[1], Miral Patel[2], Aarefa Burka[3]
[1,2,3] CVM University

Abstract

The accurate prediction of stock prices has always been a challenging task for financial analysts and investors. In recent years, deep learning and machine learning algorithms have gained significant attention for their potential in predicting stock prices. This research paper aims to compare the accuracy and performance of various deep learning and machine learning algorithms in predicting future stock prices. The study will analyze historical stock price data and evaluate the predictive capabilities of algorithms such as Recurrent Neural Networks (RNN), Convolutional Neural Networks (CNN), Support Vector Machines (SVM), Random Forests, Gradient Boosting Algorithms, Gaussian Processes, and AutoRegressive Integrated Moving Average (ARIMA). The comparison will involve metrics such as mean squared error, mean absolute error, and root mean squared error, as well as visual analysis of predicted versus actual stock prices. The research findings will provide valuable insights into the strengths and weaknesses of different algorithms for stock price prediction.rominence of SIW Antennas in modern communication technology and why they outshine traditional Horn Antennas.

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Evaluation of Anti-oxidant and Anti-bacterial Potential of Marine Seaweeds. Anti-oxidant and Anti-bacterial activities of seaweed

Nirali Goswami[1], Rita N. Kumar[2], Nirmal Kumar J.I.[3], Riya Shah[4]

[1,2,3,4] Department of Biological and Environmental Science, Natubhai V Patel College of Pure and Applied Sciences, Vallabh vidyanagar-388120 (Gujarat), India

Abstract

Gujarat has 1,600 km of long coastline and is well known for its marine macro algal abundance and diversity. Marine algae also known as seaweed are primitive non-flowering photosynthetic macrophytes occurring in tidal regions of seas and oceans and they are natural renewable resources. The main aim of present study is to anti-oxidant and anti-bacterial properties. The seaweed species were collected from Gopnath, Gulf of Cambay, Gujarat. Based on the results obtained from study it can be proved that the Chlorophyta species of seaweed shows more efficiency for used as antioxidant compared to Rhodophyta species. A seaweed species Ulva lactuca demonstrated the highest zone of inhibition in terms of antibacterial and antifungal activity when compared to other seaweed species.

Keywords: Anti bacterial, Anti-oxidant, Anti-fungal, Seaweed

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A Novel Prototype of a Multi-Functional Robot based on Path Memorizing Algorithm

Anjali Biju[1], Mit Vyas[2], Nidhi Khatri[3], Shailesh Khant[4]

[1,2,3,4] Department of Computer Science and Applications, Charusat, Changa, Anand, India

Abstract

Navibot is a path memorizing multi-functional robot. Navibot is an acronym for navigation robot. Arduino serves as a controller of the robot, and the program developed in it provides the necessary logic to drive the Motors. We have used L298N Motor driver to supply enough current to the DC motors. Power supply is provided through rechargeable batteries. It is important to thoroughly test the robot and ensure that it operates reliably and safely before deploying it in any critical application. Sensors such as IR sensor and ultrasonic sensor are used to perform functions namely line following, obstacle avoidance and human following. Apart from these functions, the robot is capable of executing a crucial task that is path memorizing. To control all these functions easily, we have two ways, one is through an IR remote and another is by using an application, which can connect to the Bluetooth module attached to the robot. The device is tested though various testing strategies for better and efficient user experience.

Keywords: Arduino, L298N Motor Driver, Bluetooth module

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A comprehensive study of heart disease monitoring and prediction methods using deep learning and IOT

Mihir H. Rajyaguru[1], Miral Patel[2]

[1] Assistant Professor, Computer Engineering Department, Madhuben & Bhanubhai Patel Institute of 1 Technology (MBIT), A Constituent Institutions of The CVM University, Anand, Gujarat, India.

[2] Professor, Information Technology Department, G H. Patel College of Engineering and Technology, A Constituent Institutions of The CVM University, Anand, Gujarat, India.

Abstract

Health monitoring is the most popular use of IoT in smart healthcare research. In the field of intelligent healthcare, IoT is a rapidly developing technology. According to data from the World Health Organization (WHO), 17.9 million deaths globally in 2019 were attributable to cardiovascular diseases (CVDs), accounting for 32% of all instances of mortality. Heart attacks and strokes were the cause of 85% of these fatalities. Effective treatment with counseling and medication for CVDs depends on early identification. Without the use of sophisticated technology and equipment, it is very difficult for the healthcare sector to monitor and diagnose such a large number of individuals with cardiac disease. The number of people with heart disease is rising daily, and with it grow biological data and data complexity. Deep learning and IoT together may be the key to unlocking and using complicated health data for patient monitoring and diagnosis. IoT sensors and deep learning models may be used to handle vast amounts of patient biological data, enabling physicians to closely monitor their patients and make choices instantly. This article began with discussing cardiac disease and its existing treatments. Next, it provides a short overview of sensors, deep learning, and the internet of things (IoT). Furthermore, a comprehensive analysis of the most recent and relevant deep learning techniques for predicting heart disease is briefly discussed.

Keywords: IoT, IoMT, CVD, Heart disease, Deep Learning, RNN, CNN, Long Deep Belief Networks, ECG, UCI, Generative Adversarial Network.

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Seismic Fragility Analysis of Base-Isolated LNG Storage Tanks Excited by Near-Field Earthquakes

S.H . Kharde[1], D. P. Soni[2]

[1] Gujarat Technological University, GTU, Ahmedabad

[2] Sardar Vallabhbhai Patel Institute of Technology, SVIT Vasad

Abstract

The probabilistic seismic assessment of a smart base-isolated LNG tank under near-field earthquake excitations using seismic fragility analysis is presented. IDA technique is utilized for the development of fragility curves for a set of nearfield earthquakes. The probability of exceedance (POE) is investigated for two major damage measures maximum isolator displacement (MID) and maximum base shear (MBS). The incremental dynamic analysis technique was performed for developing the fragility curves assuming different threshold values of damage states, namely, slight, moderate, extensive, and collapse. Further for the typical PGA levels, comparison of probability of exceedance is carried out in order to ascertain the most sensitive damage measure. It was demonstrated from the numerical results that MID is most sensitive damage measure that requires attention for the efficient performance of structure against near-field earthquakes.

Keywords: Base Isolation; Seismic Fragility analysis; Incremental Dynamic Analysis; Near-field Earthquakes.

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Unity-Based Digital Twin for 3D Printers: Bridging the Gap between Virtual and Physical Realities Enabling Real-Time Monitoring and Synchronization in Additive Manufacturing

J. S. Goswami[1], V. J. Patel[2], M. S. Holia[3]

[1]Junior Research Fellow, Birla Vishvakarma Mahavidyalaya Engineering College

[2]Head of the Mechanical Department, Birla Vishvakarma Mahavidyalaya Engineering College

[3]Assistant Professor, Electronics Department, Birla Vishvakarma Mahavidyalaya Engineering College

Abstract

In the rapidly evolving domain of additive manufacturing, the integration of digital twin technology represents a significant stride toward enhanced precision and efficiency. This research introduces an application developed using the Unity platform, aimed at creating a digital twin of a 3D printer. The core innovation lies in the real-time synchronization of the printer's physical movements with its virtual counterpart, achieved through a Raspberry Pi 4 and a local network-based Flask server. This setup facilitates the update of the printer's XYZ coordinates in the digital twin, enhancing the fidelity of the virtual model. The methodology employed incorporates the use of the M114 G-code for positional data acquisition and a C# script in Unity for dynamic visualization. This paper details the technical challenges encountered, such as network latency and data synchronization, and the solutions implemented to address them. The findings demonstrate the application's capability to accurately mirror the printer's movements, offering a tool for monitoring, diagnosing, and potentially controlling 3D printing processes remotely. Beyond operational monitoring, this research suggests new avenues for predictive maintenance and process optimization in 3D printing technology. Future enhancements may include integrating machine learning algorithms for predictive analysis and augmenting the system's responsiveness. The research thus makes a significant contribution to the field of digital twins, proposing a versatile model that can be adapted to other areas of manufacturing and process management.

Keywords: Digital Twin, IoT (Internet of Things), 3D Printer, Additive Manufacturing, Real-Time Data Processing, Unity Platform.

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Experimental Study on Lightweight Structural Concrete

Dr Deepa A Sinha[1], Dr Elizabeth George[2]

[1,2] Associate Professor, Department of Structural Engineering, Birla Vishvakarma Mahavidyalaya Engineering College, Vallabh Vidyanagar Anand (388120)

Abstract

Concrete is the most widely used material in construction industry due to its durability and compressive strength characteristics. The disadvantage of conventional concrete is that it has high self-weight. Lightweight concrete plays an important role in reducing heavy self-weight of concrete with the increase in thermal insulation property. In this paper, lightweight concrete is made by partial replacement of coarse aggregate with expanded clay aggregate by volume.

Keywords: Control Concrete, Lightweight Concrete, Expanded Clay Aggregate(ECA),Compressive strength

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SPI Enabled Driver Development using Embedded Linux Platform

Mihir Dave[1], Miral Desai[2], Brijesh Kundaliya[3], Dhaivat Patel[4], Kushal Patil[5]
[1,2,3,4,5] EC Department, CHARUSAT University, Ahmedabad, India

Abstract

An operating system employs a device driver as a piece of software to communicate with and control a specific hardware device. It provides an interface for the operating system so that it can issue commands, manage resources, and send and receive data from the gadget. Device drivers serve a crucial role in enabling the correct operation of hardware devices by bridging the gap between the operating system and the hardware. They are added to the operating system by independent or hardware developers to make communication with connected hardware easier. We are prepared to employ it in different embedded systems because we are aware that it uses the type of process. Every system executes a unique set of predetermined commands from the Device Driver. In the end, it enables the System to carry out its activities more quickly and minimizes any lag time between commands delivered and received.

Keywords: Device Driver, Embedded System, Send and receive data, operating system, predetermined commands.

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Remaining Useful Life (RUL) Prediction of Li-Ion Batteries Using Machine Learning and Deep Learning

Vatsal Viradiya[1], Milendrakumar M Solanki[2], M. S. Holia[3], Dr. D. M. Patel[4]
[1] einfochip, Ahmedabad
[2,3,4] Birla Vishvakarma Mahavidyalaya Engineering College, Vallabh Vidyanagar Anand (388120)

Abstract

This research paper aims to predict the Remaining Useful Life (RUL) of Li-ion batteries using machine learning algorithms. The project uses experimental data on the aging behavior of Li-ion batteries, including voltage, current, temperature, capacity, and energy. The data is preprocessed using feature engineering techniques and evaluated using several Machine Learning and Deep Learning models. The LSTM model performs the best with an R-squared score of 1.0. The study contributes to the development of efficient and reliable methods for RUL prediction of Li-ion batteries, which can have significant practical implications in the field of energy storage and management.

Keywords: Li-ion batteries, experimental data, aging behavior, Multiple Linear Regression, Polynomial Regression, Decision Tree Regression, Random Forest Regression, LSTM, energy storage, energy management.

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Attention Mechanisms in VQA: A Comparative Exploration of Soft, Stack, and Additive Approaches

Lata Bhavnani[1], Dr. Narendra. M. Patel[2]

[1] Research Scholar, Gujarat Technological University, Ahmedabad, Gujarat, 382424, India.

[2] Professor, Computer Department, BVM Engineering College, V.V. Nagar, Gujarat, 388120, India

Abstract

Visual Question Answering (VQA) is a multidisciplinary task that involves models that combine both computer vision for image understanding and natural language processing for question understanding and answer generation. Instead of focusing on overall image features and question features, consideration of relevant region features of the image makes it more reliable for answer generation. The attention mechanism provides this enhancement in the VQA model to focus on the relevant part of the image and question to generate the answer. This paper explores three different VQA attention models: Soft Attention, Stack Attention, and Additive Attention. We will discuss the working and performance comparison of these models to support researchers in making it informal to select the most appropriate attention mechanism for their relevant VQA models.

Keywords: Visual Question Answering (VQA), Natural Language Processing, Soft attention, Additive attention, Stack attention

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Enhancing Privacy of Electronic Cash System through Cryptography

Palak Dave

MBIT CVMU, New V.V Nagar

Abstract

Electronic exchanges are regular now days as nearly everybody in this online world manages the e money. Bitcoin was the underlying and first cryptographic coin. which for the security reasons was supplanted by zerocoin the coin exchange by zero learning convention so that no information is passed for the stamping the coin or reclaiming the coin. We have proposed homomorphic expansion to secure the reward points.Simulation results are deduced in the paper.

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High-Performance and Robust Control of Interior Permanent Magnet Synchronous Motor (IPMSM) Drives Using Fuzzy Logic Controller (FLC) with Different Defuzzification Methods Across Varied Speed Ranges

Jaydeepsinh C. Baria[1], Darshankumar C. Dalwadi[2], Keyursinh Chauhan[3], Swapnil Arya[4], Ashish Patel[5], Dharitaben patel[6]

[1] Research scholar, Gujarat Technological University, India
[2] Asso. Professor BVM Engineering College, India
[3] M. Tech, EC, DDIT, DDU, Nadiyad, India
[4] Research scholar, Gujarat Technological University, India,
[5] Research scholar, Gujarat Technological University, India,
[6] Research scholar, Gujarat Technological University, India

Abstract

Interior Permanent Magnet Synchronous Motor (IPMSM) Drive Control: The paper explores controlling an IPMSM drive across various speeds using a Fuzzy Logic Controller (FLC). The FLC manipulates d-axis current (Id) and q-axis current (Iq), regulating torque and magnetic field in the stator winding, effectively controlling motor speed and torque. FLC Strategy: The utilization of the Mamdani fuzzy logic system within the proposed FLC for simultaneous management of Torque and Flux is an efficient method. By employing various defuzzification methods such as Centroid of Area (COA), Bisector of Area (BOA), Mean of Maximum (MOM), Smallest of Maximum (SOM), and Largest of Maximum (IOM), the FLC determines the appropriate values for Id and Iq, ultimately aiming to achieve the desired speed. This method allows for comprehensive control over multiple motor parameters, enhancing the motor's performance across different operating conditions. Control Methods: The FLC design is based on the Maximum Torque per Ampere (MTPA) method for stand-still to base speed operation and the Field Weakening (FW) Method for operation above the base speed. Additionally, a hysteresis current control method is employed to generate inverter pulses. Application: The proposed system finds application in Electric Vehicle (EV) motor testing, as well as motor testing in laboratories or manufacturing plants.

Keywords: Interior Permanent Magnet Synchronous Motor (IPMSM), Fuzzy Logic Controller (FLC), Maximum Torque per Ampere (MTPA), Field Weakening (FW), Hysteresis Current Controller Centroid of Area (COA), bisector of Area (BOA), Mean of Maximum (MOM), Smallest of Maximum (SOM), Largest of Maximum (IOM)

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Real Time Parking System Using IoT

Pranjal Yadav[1], Salonee Agarwal[2], Viranchi Pandya[3], Manisha Upadhyay[4]

[1,2,3,4] Electronics & Communication Engineering, Nirma University, Ahmedabad – India

Abstract

This article introduces a groundbreaking solution to address the challenges posed by the rapid increase in vehicle ownership in countries like India, China, and Russia: a real- time smart parking system leveraging the Internet of Things (IoT). Existing parking systems suffer from limitations such as insufficient differentiation between parking spaces and a reliance on human intervention. In response, this research proposes an automated parking management system that employs IoT sensors and internet-connected devices to enable real-time detection, pre- diction, and optimization of parking spaces. The system's scope encompasses real-time vehicle detection, occupancy monitoring, parking direction and navigation, and enhanced security, offering numerous benefits including reduced traffic congestion, enhanced user experience, and environmentally friendly solutions. This re- port highlights the potential of IoT-based smart parking systems to revolutionize urban parking management and create more accessible and sustainable urban environments.

Keywords: Internet of Things (IoT); Microcontroller; Sensors We have proposed homomorphic expansion to secure the reward points.Simulation results are deduced in the paper.

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A Study on Awareness and Usage of Digital Payment Method During Lockdown Period of Covid-19

Parulben Zala[1], Dr. Kamini shah[2]
[1]SEMCOM, CVMU
[2]P G Department of Business Studies

Abstract

Purpose - The centre of attention in present research paper is the usage and awareness of digital payment. Various steps, policies and program have been undertaken by government in digital payment system for convenience and safety of citizens. This study also highlights the importance of digital payment and its awareness, usage and perception of people. Thus, one can say that e-payment will be beneficial for human life.
Research Methodology - The research applies the inferential statistical research design where data has been analyzed by using, t-test, ANOVA testing, chi-square testing.
Findings – The study observed that people are comfortable with the digital payment system and they are in process of accepting it.
Research Limitations - Primary data was gathered by questionnaires, which are susceptible to respondent subjectivity biases. Despite careful selection, the samples might not be entirely representative of the population.
Implication - Technology has made life easier for the public than it has ever been in every single field. One of these is digital payments, to which society can make various contributions to advance emerging technologies. Students, businesspeople, consumers, the government, and those striving for improvement in the current circumstances will all benefit from the study.
Value - The majority of research focuses on specific payment methods, such as credit cards, pay-tm, and digital wallets; however, no Indian researcher has sought to investigate the general awareness of digital payments. There haven't been any specific studies done on digital payment perception or awareness in Gujarat.

Keywords: Digital payment, lockdown, COVID-19, cashless, online transactions

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Enhancing Digital Resilience: Cyber Crime Combat Strategies for Women in Indian Social Media

Prof. Samirsinh P Parmar[1], Dr. Swati H. Chauhan[2]
[1] Assistant Professor, Department of Civil Engineering, Dharmasinh Desai University, Nadiad.
[2] Associate Professor, Practice of Medicine Department, Gujarat Homoeopathic Medical College & Hospital, Savli, Dist. Vadodara. Gujarat, India.

Abstract

As the digital landscape continues to evolve, women face escalating threats in the form of cybercrimes within Indian social media platforms. This paper explores the multifaceted challenges encountered by women in the digital realm and proposes empowering strategies to combat cybercrimes effectively. The study delves into the prevalence of online threats, including cyberbullying, stalking, identity theft, and harassment, targeting women specifically. Recognizing the vital role of social media in women's lives, the paper emphasizes the need for tailored combat strategies. The proposed strategies encompass digital literacy initiatives, enhanced cybersecurity measures, legal frameworks, and community support networks. By empowering women with knowledge and resources, this paper aims to contribute to the creation of a safer and more inclusive digital environment for women in India.

Keywords: Women empowerment, social media, cybercrime, digital awareness, Indian strategies, legal framework.

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Experimental Study on the Performance of COVID Waste in Developing Construction Components of Next Generation

Pradip Baldaniya[1], Shrey Rana[2], Sachin Subhash[3], Bharat kanjariya[4], Devang Jadav[5], Jagruti P. Shah[6] , Prof. (Dr.)Indrajit Patel[7]

[1] P.G. Research Scholar, Structure Engineering Maharaja sayajirao University , Baroda, India

[2,3] P.G. Research Scholar, Structure Engineering, New York University, Brooklyn, New York

[4,5] U.G Scholar , Civil Engineering, Birla Vishwakarma Mahavidyalaya, Anand, India

[6] Assistant Professor, Birla Vishwakarma Mahavidyalaya, Anand, India

[7] Principal Professor, Birla Vishwakarma Mahavidyalaya, Anand, India

Abstract

Concrete made from Ordinary Portland Cement (OPC) has two prominent characteristics: Compressive Strength and Tensile Strength. Concrete is quite remarkable in its compressive strength but is weak in tension. Moreover, it also possesses the disadvantage of being a brittle material. These weaknesses might act as a limiting agent in its usage and safety in construction. These drawbacks can be avoided by using adequate reinforcements or adding a sufficient amount of waste consisting of fibres to the concrete mix. The effects of adding Polypropylene Fibres are examined in this experiment. The project's polypropylene fibres are derived from biomedical waste such as PPE (Personal Protective Equipment) kits and masks. In response to COVID-19, hospitals, healthcare facilities and individuals are generating more waste than usual, including masks, gloves, and other personal protective equipment. Due to low investment in core infrastructure, developing countries don't have access to modern technology to treat mixed contaminated medical waste. Hence, we attempt to design a mix for proper utilization of waste in construction components after shredding the waste. The tests that will be conducted on the concrete are Compressive Strength Test, Split Tensile strength Test and Flexural Strength Test.

Keywords: Biomedical waste, Personal Protective Equipment, Paver blocks, Concrete mix.

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Enhancing Digital Resilience: Cyber Crime Combat Strategies for Women in Indian Social Media

Prof. Samirsinh P Parmar[1], Dr. Swati H. Chauhan[2]

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[2] Associate Professor, Practice of Medicine Department, Gujarat Homoeopathic Medical College & Hospital, Savli, Dist. Vadodara. Gujarat, India.

Abstract

As the digital landscape continues to evolve, women face escalating threats in the form of cybercrimes within Indian social media platforms. This paper explores the multifaceted challenges encountered by women in the digital realm and proposes empowering strategies to combat cybercrimes effectively. The study delves into the prevalence of online threats, including cyberbullying, stalking, identity theft, and harassment, targeting women specifically. Recognizing the vital role of social media in women's lives, the paper emphasizes the need for tailored combat strategies. The proposed strategies encompass digital literacy initiatives, enhanced cybersecurity measures, legal frameworks, and community support networks. By empowering women with knowledge and resources, this paper aims to contribute to the creation of a safer and more inclusive digital environment for women in India.

Keywords: Women empowerment, social media, cybercrime, digital awareness, Indian strategies, legal framework.

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Effect of Silver Nanofluid on Heat Transfer Coefficient of Cylindrical Heat Pipe using Artificial Neural Network

Dr. Neeraj Chavda[1], Dr. Rakesh Bumataria[2], Francisca Rosique[3], Ar. Ruma Singh[4]

[1] Associate Professor, Madhuben and Bhanibhai Patel Institute of Engineering and Technology, New V. V. Nagar, Anand, Gujarat, India

[2] Lecturer, Government Polytechnic, Porbandar, Gujarat, India

[3] Universidad Politécnica de Cartagena, Department of información and communication technologies, Cartagena, Spain.

[4] Associate Professor, Shantaben Manubhai Patel School Of Studies & Research In Architecture And Interior Design, New V. V. Nagar, Anand, Gujarat, India

Abstract

Heat pipe is a tiny device to remove the heat from various highly power consuming applications. Large number of parameters affect the performance of heat pipe charged with nanofluid as compared with the heat pipe charged with demineralized water. Part I of the paper reports the experiments performed on cylindrical copper heat pipe charged with silver nanofluid having different sizes and concentrations of silver nanoparticles at different power input and angle of inclination. It requires to carry out wide range of experiments on heat pipe to propose the right combination of parameters for suitable application. Experimentation results can also be combined with the simulation fundamentals to propose the ideal combination of parameters for particular application. The present study deals with generating and training of several ANN structures based on results obtained in Part I of the paper and suggesting the best ANN structure to predict the performance of heat pipe under study in terms of heat transfer coefficient of evaporator and condenser section of heat pipe. Sixty-five ANN structures have been trained using six hundred and eighty data sets using Matlab R2017a software considering power input, heat pipe inclination angle, size and concentration of silver nanoparticles, average condenser and evaporator temperature as input neurons and heat transfer coefficient of evaporator and condenser section as output neurons. Trained ANN structures then employed to simulate the twenty data sets to obtain the predicted values. Predicted and experimental values have been compared in terms of correlation coefficient, MSE, NMSE, RMSE, MAE and MARD. Out of sixty five ANN structures, the layer recurrent network structure with eleven neurons at hidden layer yields the highest value of correlation coefficient and minimal error in prediction in terms of MSE, RMSE, NMSE, MARD and MAE and the same has been suggested as the best structure to predict heat pipe performance when it is charged with silver/water nanofluid in terms of heat transfer coefficient of condenser and evaporator section.

Keywords: Simulation, ANN Structure, Heat Pipe, Silver/Water Nanofluid, Correlation Coefficient

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Real Time Parking System Using IoT

Pranjal Yadav[1], Salonee Agarwal[2], Viranchi Pandya[3], Manisha Upadhyay[4]

[1,2,3,4] Electronics & Communication Engineering, Nirma University, Ahmedabad – India

Abstract

This article introduces a groundbreaking solution to address the challenges posed by the rapid increase in vehicle ownership in countries like India, China, and Russia: a real- time smart parking system leveraging the Internet of Things (IoT). Existing parking systems suffer from limitations such as insufficient differentiation between parking spaces and a reliance on human intervention. In response, this research proposes an automated parking management system that employs IoT sensors and internet-connected devices to enable real-time detection, pre- diction, and optimization of parking spaces. The system's scope encompasses real-time vehicle detection, occupancy monitoring, parking direction and navigation, and enhanced security, offering numerous benefits including reduced traffic congestion, enhanced user experience, and environmentally friendly solutions. This re- port highlights the potential of IoT-based smart parking systems to revolutionize urban parking management and create more accessible and sustainable urban environments.

Keywords: Internet of Things (IoT); Microcontroller; Sensors

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An Appraisal of Machine Learning Application in Optical Communication System

Shailesh Khant[1], Mayur Makwana[2], Hema Patel[3], Atul Patel[4]
[1,2,3,4] Charusat University, Changa

Abstract

Machine learning (ML) has the potential to revolutionize the optical communication industry, and as a result, it is being closely studied. The purpose of this abstract is to summarize the main conclusions and applications covered in several scholarly publications. The studies show that ML can improve the performance, fault monitoring, and quality of optical networks. Whether ML is a cost-effective solution for optical networks is a crucial question. These studies highlight the application of ML in Quality of Transmission (QoT) estimation and reverse system design of Raman amplifiers. They also address the challenge of vendor-specific equipment and open networks. Fault monitoring in passive optical networks (PON) is another important application area. Overall, these papers demonstrate the potential of ML in optical communication

Keywords: Optical Communication, PON, QoT, Machine Learning (ML)

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Enhancing Time-Series Analysis for Research and Education with Real-Time Designed Software

Maulin Punjabi, Dr. Harsha Padheriya
[1]Assistant professor, SEMCOM, CVM University
[2]Assistant professor, Department of computer science and Engineering, Institute of advance research

Abstract

This study aimed to develop a real-time designed software for statistical analysis and compare its effectiveness with traditional software. The research design followed a quantitative approach, with data collection and analysis conducted using both types of software. The software development process involved designing an intuitive user interface and incorporating advanced features for complex statistical analyses. The results showed that the real-time designed software provided faster and more accurate results, especially for complex analyses. The interpretation of the data revealed significant differences in the output of the two software types. The conclusion suggests that the real-time designed software is a promising alternative to traditional software for statistical analysis, offering several advantages, such as real-time results and user-friendliness. However, further testing and validation are required to improve its accuracy and reliability.

Keywords: Real-time software, traditional software, data analysis, software development, validation data, user-friendly, intuitive, complex analyses, real-time results

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Coal Mining Safety using Zigbee

Maitri Patel[1], Munmun Sangtani[2], Viranchi Pandya[3], Manisha Upadhyay[4]
[1,2,3,4] Electronics & Communication Engineering, Nirma University, Ahmedabad – India

Abstract

In the domain of coal mining safety, this project implements a wireless gas monitoring system. By integrating an Arduino Uno with a gas sensor, DHT-11 sensor and utilizing XBee S2C modules for data transmission, we achieve real- time gas level an temperature monitoring. The collected data is wirelessly transmitted to another Arduino Uno, which is connected to a serial monitor, facilitating swift responses to hazardous conditions. This project caters to the increasing need for improved safety measures in coal mining operations by harnessing advanced technology and real-time data monitoring. Our system provides a solution to mitigate gas-related hazards, monitor environmental conditions, and safeguard the well-being of miners. This contribution aligns with the broader objective of enhancing safety protocols within the mining industry.

Keywords: Internet of Things, Sensors and Automation

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Role of Women Engineering Faculties in Supporting Girl Students to Develop a Sustainable Career in Engineering Field

Dr. Sejal H. Sarvaiya[1]
[1] Assistant Professor In English Department Of Science & Humanities, Vishwakarma Government Engineering College, Gujarat Technological University, Ahmedabad, Gujarat, India

Abstract

The underrepresentation of women in engineering education and profession has been a topic of extensive research. Consistent efforts have been made to motivate girl students for engineering education and profession to meet the requirement of competent engineering workforce. The increased participation of women in STEM education and careers is quite noteworthy. The present research article investigates the current status of Girl students in Engineering education and occupation in India and argues for more conscious role to be played by existing women engineering faculties to encourage and sustain fair women participation to engineering education as well as to engineering industry. There is a huge possibility of contribution for women engineering faculties to support girl students in engineering education and subsequent employment and retention in industry for sustainable growth objective of our country.

Keywords: Women Engineering Students, Women Engineering Faculty, Gender Parity, Sustainable Career

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POCUS : Enhancing Productivity - Integrating Pomodoro, To-Do Lists, and Performance Evaluation

Kavya Dave, Jaydeep Baldaniya, Yuvrajsinh Chauhan, Dr. Mayur Vegad, Zeelrajsinh Mahida, Dr. Narendra Patel

[1,2,3]Student, Computer Engg. Dept. Birla Vishvakarma Mahavidyalaya Anand, India
[4]Chief Technology Officer Nxthop Solutions Pvt. Ltd. Surat, India
[5,6]Professor, Computer Engg. Dept. Birla Vishvakarma Mahavidyalaya Anand, India

Abstract

This research introduces POCUS, a unified platform integrating the Pomodoro technique, To Do Lists, and User Performance Evaluation. POCUS addresses time management challenges by offering cross-platform accessibility, customization options, and user performance analysis tools. It quantifies user performance through comprehensive metrics, generating reports for informed decision-making and goal-setting. POCUS ensures reliable time tracking, accessible task details, and insightful analytics. It supports diverse scenarios, aiding students' study sessions, professionals' task management, and cross-platform workflows. Future enhancements include AI integration, collaborative features, and popular tools integration, aiming to elevate user experience and productivity.

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Health Monitoring and checkup System during Pandemic

Shailesh Khant Tarang Baraiya Vrund Patel Yash Patel Hema Patel

[1,2,3,4,5]Faculty of Computer Science and Applications, Charusat, Changa, Anand, India

Abstract

The number of patient growing rate is high in the midst of the during COVID19 pandemic and thereafter. It takes a lot of patience and stress for the physicians to keep track of all the patient. We are creating IOT-based Patient Health Monitor System to combat the major issue, which is doctors' and their families' fear of infection. This system will continually check the patient's health. This system will be detecting heart rate and temperature will be tracked by this system. With the aid of this system, we can monitor patients' health status and whether they would require any medical attentions instantly contact the appropriate authorities. Since we now know that the coronavirus and other viruses are deadly and damaging to society, let's go on. Check out the system's components, which include an at mega 328p CPU, an LCD monitor, a blood pressure and heart rate sensor, a power adapter, and a wifi module.

Keywords— Pulse Oximeter, Temperature, GSM, Embedded System

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Leveraging Inverse Reinforcement Learning for Cybersecurity in Smart Cities

Cherish Vaidya, Dr. Bhargav Goradiya, Dr. Mehfuza Holia
[1,2,3,]Birla Vishvakarma Mahavidyalaya Engineering College

Abstract

This study investigates the role of Inverse Reinforcement Learning (IRL) in fortifying cybersecurity within smart cities, recognizing the escalating integration of advanced technologies in urban landscapes. Addressing cybersecurity challenges, including IoT vulnerabilities and privacy concerns, the paper explores IRL's potential in analyzing user behaviors and system interactions to detect cyber threats. It discusses the development of adaptive cybersecurity systems driven by IRL, emphasizing real-time threat mitigation. Ethical considerations and future prospects, envisioning AI-driven threat analysis and secure-by-design strategies, are also examined. The paper aims to contribute insights into leveraging IRL for safeguarding smart city infrastructures, fostering resilient urban environments.

Keywords—Inverse Reinforcement Learning (IRL), Smart city cybersecurity, Urban infrastructure security, Internet of Things (IoT) security, Anomaly detection, Behavioral modeling, AI-driven threat analysis, Secure-by-design approaches, Ethical considerations, Privacy-preserving techniques, Human-centric cybersecurity, Adaptive cybersecurity strategies, Future trends in IRL, Threat prediction in smart cities, Context-aware cybersecurity

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Some Approximation Properties of Stancu type generalization of Lupas Operators

Usha Varma, Rajiv Gandhi
[1]Department of Mathematics, Gujarat Technological University, Ahmedabad - 382 424, (Gujarat), India
[2]Department of Mathematics, BVM Engineering College,
Vallabh Vidyanagar - 388 120, (Gujarat), India

Abstract

In this study, we have constructed a new sequence of positive linear operators by using Stancu variant of Lupa\c{s} ,operators using Korovkin approximation theorem. We also show that sensitivity of choice of $\phi(x)$ used in Stancu type of Lupa\c{s} operators by taking $\phi(x)=x(1+x)$ to convergence in weighted space.

Keywords: Lupa，s operators, Korovkin's Theorem, Stancu type generalization of Lupas Operators, Convergence in weighted space.

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Indian Women's Skill Development Programs: Present Situation and Prospects for the Future

Dr Khyati Patel
Assistant Professor, Semcom, CVM University, Vallabh Vidyanagar, Gujarat, India

Abstract

Every nation in the world advances economically and socially via the application of skills and information, and women play a crucial role in this process. Achieving gender equality in the workplace requires expanding females' right of entry to teaching and training programs. To raise women's socioeconomic standing and increase their economic contribution to the nation, the Indian government is offering numerous skill development programs. This also aimed to increase the number of workers in the industrial and service sectors and promote gender equality. The issue and difficulties associated with talent progress training for womankind in India as well as an impact of skill development programs on women's socioeconomic standing, self-image, and confidence is included in this article

Keywords— women, workplace, skill development programs, entrepreneurship, socioeconomic standing

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On Performance of OFDM-aided Downlink Underlay Cognitive Radio Systems

N.M. Bankar, K. G. Maradia, Kesar Bavda, Vaishnavi Shah, Shrey Panchal
[1]Research Scholar, Gujarat Technological University, Ahmedabad
[2]Professor and I/C Principal, GEC Rajkot, Gujarat, India
[3,4,5] Student, EC, GEC Gandhinagar, Gujarat, India

Abstract

High spectral efficiency (SE) and informationcentric data traffic are supported by the next-generation cellular communication network and are intended to meet the needs of intelligent devices. The optimal use of spectrum resources is needed for bandwidth-intensive communication in multimedia multicast applications. Therefore, limited resource availability leads to interference and calls for additional SE. Cognitive radio (CR) is a potential option for enhancing SE by allowing lowpriority unlicensed users to collaborate on the radio spectrum with high-priority licenced users. It gains increased support in 5G networks due to these transmission opportunities. Using an appropriate opportunistic interference alignment (OIA) approach, an underlying opportunistic communication via a CR-aided orthogonal frequency-division multiplexing (OFDM) system is investigated in this work. The Monte Carlo simulations demonstrated the achievable sum rate and transmission opportunities performance.

Keywords—5G, interference alignment, cognitive radio, orthogonal frequency-division multiplexing, licensed and unlicensed users.orovkin's Theorem, Stancu type generalization of Lupas Operators, Convergence in weighted space.

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"Decoding deception: a comprehensive analysis of the fraud triangle in selected banks"

Dr. Dharaben Mehta
Assistant Professor, Semcom, CVM University, Vallabh Vidyanagar, Gujarat, India

Abstract

This study aims to delve into the intricate dynamics of fraud within the banking sector. The Fraud Triangle, a conceptual framework comprising three key elements – opportunity, pressure, and rationalization, serves as the theoretical backbone for this investigation. This research focuses on investigating three essential components in the fraud triangle theory: opportunity, pressure, and rationalization. Utilizing regression analysis, the obtained R-squared (R2) value of 0.558 suggests that these three predictor variables—opportunity, pressure, and rationalization—explain 55.8% of the variation in employee fraud within the banking sector. The F-statistic of 40.031, accompanied by a significantly low p-value of 0.000, emphasizes the statistical significance of the model.Keywords: fraud, fraud triangle, opportunity, pressure, rationalization

Keywords- fraud, fraud triangle, opportunity, pressure, rationalization

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Process Automation in Women-led MSME Units : A Case-study of Small Scale Industries in Uttarsanda

Aadarsh Pillai, Dr. Rina Dave
[1]Research Scholar, CVM University, Vallabh Vidyanagar, Gujarat, India
[2]SEMCOM, CVM University, Vallabh Vidyanagar, Gujarat, India

Abstract

With the corporate world going through tough competition, business units need to constantly innovate and upgrade using the latest technology. This goes well not only with large-scale and medium-scale enterprises, but also those small-scale as well as micro-enterprises and cottage industries, mostly run by women entrepreneurs. While these women entrepreneurs are playing a vital role in the development of the Indian economy, they need to ensure they are ready to be the game-changers by moving with the time and are implementing the best practices in their business. Such technologies help in ease of production process, improvement and standarization of quality as well as wastage of resources. Also, technology can also be used for identifying newer markets and the means to reach there. With the world that has now become a global village, technology has also become the backbone of supply chain management. the Hence, the more use of technology, the higher the benefits for the entrepreneur.

Keywords— MSME, Small Scale Industries, Women Entrepreneurs, Technology in Business

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Vallabh Vidyanagar - 388120, Anand, Gujarat, INDIA.
Phone: +91-(02692)230104
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