P.A. COLLEGE OF ENGINEERING

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APPROVED BY AICTE

PROCEEDINGS OF

ICEST 2024

INTERNATIONAL CONCLAVE ON
ENGINEERING SCIENCES & TECHNOLOGY

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PACE Conclave 2024

23 & 24 APRIL 2024

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PACE Conclave 2024

ICEST 2024
INTERNATIONAL CONCLAVE ON ENGINEERING SCIENCES & TECHNOLOGY

About ICEST

ICEST (International conclave on Engineering Sciences and Technology)is an international peer reviewed event to bring together academia, engineers, students, and researchers in the field of Engineering, Science and Technology, making it an ideal platform for sharing knowledge, fostering industry-academic collaborations, and evaluating emerging technologies from around the world. Participants will be able to exchange ideas in order to profit from each other's contributions, as well as learn about current research being conducted throughout the world. The conference's main purpose is to support research and development activities that will be needed in the future, with an emphasis on all potential and recent fields of Engineering. Several well-known professionals in the fields of Engineering will share their knowledge and experience with the attendees. This conference will serve as a global platform for the presentation of novel research findings, as well as the exchange and dissemination of creative and unique research experiences. The conference aims to enhance the state-of-the-art in all fields of Engineering by encouraging novel, high-quality research discoveries and innovative solutions to upcoming and challenging engineering problems.

Theme's for ICEST

Theme 1
Mechanical Engineering

Theme 2
Civil Engineering

Theme 3
Electronics & Communication Engineering

Theme 4
Computer Science & Engineering

Theme 5
Biotechnology

Theme 6
Basic and Applied Science

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PACE Conclave 2024

ICEST 2024
INTERNATIONAL CONCLAVE ON ENGINEERING SCIENCES & TECHNOLOGY

Theme 1 *Mechanical Engineering*

- Design and production
- Thermal sciences
- Manufacturing and machining
- Energy and environment
- Robotics and automation
- Materials and modelling

Theme 2 *Civil Engineering*

- Geotechnical and environment
- Building materials and construction
- Architecture and Planning
- Structural engineering
- Transportation and Traffic
- Water resources and irrigation

Theme 3 *Electronics & Communication Engineering*

- Communication & Networking
- Signal & Image Processing
- Circuits, Systems and Antennas
- Devices, Materials and Processing
- Energy and Power Electronics
- Robotics, Control, and Automation

Theme 4 *Computer Science & Engineering*

- Data Science and Machine learning
- Cloud and grid computing
- Blockchain
- Internet of Things (IOT)
- Security & Cryptography
- Computational sciences

Theme 5 *Biotechnology*

- Food technology
- Drug design & Nanobiotechnology
- Agricultural biotechnology
- Clinical research
- Environmental engineering
- Bioprocessing

Theme 6 *Basic & Applied science*

- Chemical sciences
- Materials chemistry & polymers
- Graph theory
- Fluid mechanics
- Nanotechnology
- Applied Physics

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Message from Managing Trustee

Esteemed Guests, Distinguished Faculty Members, Scholars, Researchers, and Students,

It is with immense pleasure and pride that I extend my warmest greetings to each of you on the inauguration of the PACE Conclave-24: International Conclave on Engineering Sciences & Technology (ICEST-24).

I express heartfelt gratitude to the organizers, faculty, and staff for their tireless efforts in making this event a reality. Your dedication to fostering academic excellence and innovation in engineering is commendable.

ICEST-24 stands as a testament to our pursuit of knowledge and excellence. With six distinct conferences covering various engineering disciplines, this conclave serves as a platform for intellectual discourse and collaboration.

In today's rapidly evolving world, the themes of ICEST-24 offers an opportunity to engage with experts, explore trends, and chart the future of engineering.

I'm pleased to see the emphasis on publications and knowledge dissemination through conference proceedings and esteemed journals.

At this juncture, I would also like to emphasize the commitment of PACE Group to research and innovation and I'm delighted to see its impact through the presence of numerous faculty PhD holders from various research centers at PACE.

As we embark on this journey, I encourage active participation and collaboration. In it closing, I wish ICEST-24 success. May it catalyze innovation and positive change, leaving a mark on engineering education and research.

Warm regards,

Mr. Abdulla Ibrahim

Managing Trustee & GC Member

PAET, Mangalore

Message from Trustee

First of all I thank god almighty for blessing us to come together to discuss and deliberate on our current affairs and future progress. Know that this surely is a blessing.

During the Second World War, Einstein had to flee Germany to find peace so that he could continue with his work. Epidemics brought societies to survival mode.

A flood recently in the UAE unlike anything seen in the last 75 years had cut supplies of basic essentials like food and water. Even though there are high raise towers, there was no Electricity supply, Gas supply, Air conditioning, lift services and had compromised tap water supply. Even fuel was disbursed to vehicles in limited quantity in an oil rich nation. However, the people came together and did what makes us human, care for each other and contribute in whatever way we can. I myself have left my building and am staying in our family residence.

In short, only peace can enable progress and we have to continuously be grateful to God Almighty for the same.

Secondly, I would like to appreciate the host of this PACE conclave event headed by Abdulla Ibrahim, Ramis sir (other key names and categories of staff, participants and well wishers). The challenges of hosting a successful event requires contribution from everyone from top to bottom, in their respective capacities, which was shown throughout the two days. Our founder Chairman, may god rest his soul, was an enthusiast of both hosting intelligence and accommodating progress. Our actions only resonate his will.

To host this academic conclave which had a wide range of topics covered was our honor. Academia allows for discussions, debates and brainstorming beyond the confinements and limitations of financial implications.. a place where imagination has no limits.. a place that improves our lives, our planet and lives of our future generations to its fullest potential.

In this conclave we have discussed areas of biotechnology which include immunotheraputic approaches, food technology, drug design and nano biotechnology, agricultural biotechnology, bio processing, environmental engineering and innovative emulsification techniques for bio medical applications.

On the electronics and communications front, there were discussions on communication networks, energy and fuel cells.

On the engineering and tech front, discussions on deep learning, machine learning, data science, cloud and grid computing, blockchain, cryptography and security.

On the the basic science front, a deep dive into organic and inorganic chemistry..

On the civil engineering front, sustainable cities, transportation and geotechnological engineering, architecture, planning and construction technology, water resources, irrigation and environment engineering.

And finally, mechanical engineering which included design, production, thermal sciences, materials such as fiber reinforced plastic laminates, modeling and manufacturing.
All discussions and debates were about remarkable areas where our future surely lies.
However, always remember, that even in the heights of our scientific progress, when there was even a hint of arrogance in our capabilities. a pandemic had brought the world to a stand still making us redetermine our capacity. There always is much more to learn and achieve which can only be done with faith, humility, grace and caring for each other.
Today feels like we are on the edge of a new horizon. It feels so, due to changes experienced in various aspects of human life. From the pain of loosing loved ones during
the COVID pandemic to valuing relationships like never before. From disregarding our social commitments to becoming responsible global citizens. From knowingly or unknowingly damaging and depleting our planet's climate
and resources to enacting major initiatives towards climate change and a healthier planet. From dwelling on previous achievements to striving for effective governance. From technology making far reaching attempts to the break through invention of generative AI and others. Businesses creating innovative products, services and models to attract a new era and a renewed lifestyle. A horizon of oppurtunity.

I wish you all the best with hopes that such a conclave causes a ripple effect of goodness throughout our region and our world

Warm regards,
PA Zubair Ibrahim
Managing Trustee & GC Member
PAET, Mangalore

Message from Partnering University

In a captivating address at the international conclave on engineering, science, and technology, a comprehensive exploration into the interconnectedness of disciplines was eloquently presented. Soham from Infosys delivered a thought-provoking speech, drawing on the insights of A. M. L. Ruff to highlight the common ground shared by various fields through set theory. The event itself was commended for its organization, providing a platform beneficial for researchers, academics, practitioners, and students alike.

The discourse then delved into the realm of information technology, presenting a set of five pivotal elements: data, information, knowledge, intelligence, and wisdom. Each element was meticulously dissected, illustrating the journey from data accumulation to wisdom application. The significance of continuous learning and practical application in fostering intellectual progress was underscored, emphasizing the conclave's aim to cultivate wisdom among attendees.

A visionary outlook on the future of engineering was painted, foreseeing a departure from conventional disciplinary boundaries towards interdisciplinary collaboration. The necessity of integrating diverse disciplines and adopting a holistic approach to education was emphasized, particularly in shaping engineers capable of innovation across fields.

The transformative potential of artificial intelligence in engineering was showcased through a compelling example of community washing centers. By leveraging AI, these centers optimize water utilization, foster employment opportunities, and drive sustainable solutions. However, it was acknowledged that challenges outlined in Rajiv Malhotra's book must be addressed, particularly concerning economic development, power dynamics, and psychological implications of AI.

In conclusion, while the integration of artificial intelligence and engineering may disrupt existing paradigms, it also presents an opportunity for global unity and sustainable progress. Through informed discussions and collaborative initiatives, attendees were encouraged to leverage technology for the betterment of society and the planet.

The address concluded with gratitude for the attendees' participation and best wishes for the success of the conclave's upcoming events.

Warm regards,

Dr. P. Nagabhushan

Vice Chancellor

Vignan University, AP

Message from Partnering University

First and foremost, I extend my heartfelt gratitude to all the participants, researchers, scholars, and delegates who have contributed to the success of this International Conference on Engineering, Science, and Technology (ICEST-2), hosted by P.A College of engineering, Mangalore, conducted under the umbrella of PACE Conclave. Your dedication, hard work, and scholarly endeavors have undoubtedly enriched the academic discourse and propelled us forward in the pursuit of knowledge and innovation.

I would also like to extend my appreciation to the organizing committee, volunteers, and support staff who have worked tirelessly behind the scenes to ensure the smooth execution of this event. Your commitment to excellence and attention to detail have played a pivotal role in making ICEST-2 a resounding success.

Today marks a significant milestone for the graduating students who have completed their academic journey at Presidency University. Your hard work, determination, and perseverance have culminated in this moment of triumph, as you prepare to embark on new beginnings and contribute to the global community as responsible citizens and leaders in your respective fields.

As you step out into the world beyond these university walls, I urge you to uphold the values of integrity, compassion, and excellence that have been instilled in you during your time here. Remember that your education is not just a means to personal success but also a powerful tool for positive change in society.

I encourage you to embrace challenges with courage, curiosity, and a growth mindset, knowing that every obstacle is an opportunity for growth and learning. Stay true to your passions, follow your dreams, and never lose sight of the impact you can make in the world.

In closing, let us reflect on the significance of our collective efforts in advancing knowledge, fostering collaboration, and creating a brighter future for generations to come. As we bid farewell to ICEST-24, let us carry forward the spirit of inquiry, innovation, and inclusivity that has characterized this conference and continue to push the boundaries of human knowledge and understanding.

Thank you once again to everyone who has contributed to the success of ICEST-24, and I wish the graduating students all the best in their future endeavors. May you continue to strive for excellence and make a positive impact wherever your journey may take you.

Warm regards,

Dr. Surendra Kumar A. M.
Pro-Vice Chancellor
Presidency University
Bengaluru -560064

Message from Chief Guest

It is good to see PACE conduct International Conclave on Engineering Sciences & Technology (ICEST-24) and under the umbrella of ICEST-24, cover six different departments from Basic Sciences, Biotechnology, Computer Science, EnC, Civil Engineering and Mechanical Engineering.

Whatever be the field or whatever the current industry buzz/hot topic - like currently GenAI, AI/ML, Robotics or Fuzzy - students and academicians should focus on basic fundamentals. For example, GenAI is based on constructs from Set Theory from Mathematics and Statistics. Sticking to fundamentals and basics also gives a strong foundation in any subject, for example - someone who was good in machine design and gears ended up designing the most important component of rover-Pragyan on ISRO's moon mission Chandrayaan 3.

Wishing PACE conducts this multi-disciplinary conclave every year, to enthuse students and academicians think and construct beyond their regular academic curriculum.

Thanking PACE and Dr.Ramis & Team for inviting me to be chief guest, and wishing two day conclave a success.

Warm regards,
Mr. Sohan M.
Senior Project Manager
Infosys, Mangalore

Message from General Chair

Dear Esteemed Colleagues and Participants,

Welcome to the PACE CONCLAVE: International Conclave on Engineering Sciences & Technology – 2024 (ICEST-24).
It is with great pleasure and enthusiasm that we gather here, both physically and virtually, to share insights, exchange ideas, and collaborate towards advancing the frontiers of engineering sciences and technology. In today's interconnected world, where innovation drives progress, this conclave serves as a vital platform for fostering interdisciplinary dialogue and addressing global challenges.
This year's conference theme is multidisciplinary with six different themes including Mechanical Engineering, Civil Engineering, Computer Science, Electronics & Communication, Biotechnology and Basic Science, underscoring our commitment to pushing boundaries and exploring new horizons in engineering and technology. Through thought-provoking presentations, engaging discussions, and networking opportunities, we aim to inspire creative solutions and catalyze impactful change.
I extend my heartfelt gratitude to our distinguished keynote speakers, esteemed presenters, diligent organizing committee members, dedicated volunteers, and collaborated universities for their invaluable contributions in making this event possible. Your expertise, passion, and dedication truly embody the spirit of this conclave.
To all participants, whether seasoned researchers, budding scholars, industry professionals, or enthusiastic students, I encourage you to seize this opportunity to connect with peers, forge collaborations, and deepen your knowledge in your respective fields.
As we embark on this enriching journey together, let us embrace diversity, innovation, and the collective pursuit of excellence. May this conclave inspire us to not only envision a better future but also actively strive towards realizing it.

Thank you for your participation, and I wish you a fruitful and memorable experience at the ICEST-24.

Warm regards,
Dr. Ramis M. K.
Conference Chair
International Conclave on Engineering Sciences & Technology – 2024

Message from Convenor

Dear Esteemed Colleagues and Participants,

Welcome to the PACE CONCLAVE: International Conclave on Engineering Sciences & Technology – 2024 (ICEST-24).

As the Convenor of this prestigious event, it is my honor to extend a warm welcome to all attendees, both in person and virtually. The essence of this conclave lies in its ability to bring together brilliant minds from around the globe to engage in meaningful discourse, share cutting-edge research, and shape the future of engineering and technology.

Under the PACE CONCLAVE: ICEST-24, we are poised to explore the frontiers of innovation, uncover novel solutions to pressing challenges, and foster interdisciplinary collaborations that transcend boundaries. This conclave serves as a beacon of inspiration, igniting the spark of creativity and driving progress in our ever-evolving world.

I extend my sincere appreciation to our esteemed keynote speakers, distinguished presenters, dedicated organizing committee members, committed volunteers, and generous sponsors for their unwavering support and contributions. Your collective efforts have been instrumental in shaping this event into a platform of excellence.

To all participants, I encourage you to actively engage in the discussions, seize opportunities for collaboration, and leverage the wealth of knowledge and expertise present at this conclave. Your involvement is pivotal in shaping the outcomes and impact of our collective endeavors.

As we embark on this journey of discovery and innovation, let us embrace diversity of thought, harness the power of collaboration, and strive for excellence in everything we do. Together, we have the potential to effect positive change and drive progress on a global scale.

Thank you for your participation, dedication, and enthusiasm. I wish you all a rewarding and inspiring experience at the ICEST-24.

Warm regards,

Dr. Shareefraju J. Ukkund

Convenor

International Conclave on Engineering Sciences & Technology – 2024

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PACE Conclave 2024

ICEST 2024
INTERNATIONAL CONCLAVE ON ENGINEERING SCIENCES & TECHNOLOGY

PACE CONCLAVE

PACE Conclave is an initiative by P. A. College of Engineering, aiming to bring together academia, industry, and research personnel through a series of events. The International Conclave on Engineering Science & Technology 2024 (ICEST 24) is the inaugural event in this endeavor. Various conferences will be conducted under the umbrella of ICEST-24.

P. A. EDUCATIONAL TRUST (R.)

A remarkable cornerstone of this endeavor is the P.A. Educational Trust (PAET) Mangaluru, a vital subsidiary of the PACE Group. Founded by its Late Chairman, Dr. Ibrahim Haji, PACE Group currently manages 16 educational institutions with over 1,200 teaching staff, 500 non-teaching staff and over 30,000 students from 25 nationalities. Nestled within the 65-acre campus named, PACE KNOWLEDGE CITY, PAET, headed by Mr. Abdulla Ibrahim, manages 6 distinctive institutions, namely: P. A. College of Engineering, Centre for Management Studies & Research, P. A. First Grade College, P. A. Polytechnic, P. A. Institute of Pharmacy, and P. A. Institute of Physiotherapy.

P. A. COLLEGE OF ENGINEERING

P. A. College of Engineering (PACE), situated in PACE KNOWLEDGE CITY and established in the year 2000, offers diverse undergraduate programs, including Electronics and Communications Engineering, Artificial Intelligence & Machine Learning, Civil Engineering, Mechanical Engineering, Computer Science & Engineering, Biotechnology, and specialized Computer Science & Engineering (IoT, Cybersecurity, including Blockchain Technology). The Mechanical Engineering, Computer Science & Engineering, and Biotechnology programs are accredited by National Board of Accreditation (NBA). PACE also provides MBA and Ph.D. programs, reflecting its holistic educational approach.

VISION

PACE is envisaged as a centre of evolution for excellence in Technological, Management and Research Education. The institution aspires to spread universal knowledge through villages & cities enabling the expansion of human resources.

MISSION

- To provide career-oriented professional education to produce technically competent engineers and managers with moral and ethical values.
- To foster and promote an effective learning environment in the campus to be recognized as a place that encourages excellence and diversity in thoughts.
- To provide research and intellectual resources to address problems facing industries and the society while advancing the scopes of multidisciplinary applications.

ISBN-978-81-19905-39-3

PACE Conclave 2024

DEPARTMENT OF MECHANICAL ENGINEERING

Under the umbrella of

ICEST 2024

INTERNATIONAL CONCLAVE ON ENGINEERING SCIENCES & TECHNOLOGY

23 & 24 APRIL 2024

MECH-TECH

INTERNATIONAL CONFERENCE ON EMERGING TRENDS IN MECHANICAL ENGINEERING

PROCEEDINGS

P.A. COLLEGE OF ENGINEERING

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24 YEARS

PACE KNOWLEDGE CITY

Partners

PRESIDENCY UNIVERSITY

VIGNAN'S UNIVERSITY

Near Mangalore University, Mangaluru, Karnataka, India - 574153

PACE Conclave 2024

ICEST 2024
INTERNATIONAL CONCLAVE ON ENGINEERING SCIENCES & TECHNOLOGY

MECH-TECH
INTERNATIONAL CONFERENCE ON
EMERGING TRENDS IN MECHANICAL ENGINEERING

Message from Conference Chair

Dear Esteemed Colleagues and Participants,

Welcome to the MECH-TECH 2024: International Conference on Emerging Trends in Mechanical Engineering
It brings me great joy and excitement to convene here, both in person and virtually, for the MECH TECH 24: International Conference on Emerging Trends in Mechanical Engineering. Our gathering today signifies a collaborative effort to exchange insights, share ideas, and propel the frontiers of Mechanical Engineering forward. In our interconnected world, where innovation is the driving force behind progress, this conference stands as a pivotal platform for nurturing interdisciplinary dialogue and tackling global challenges head-on.
With the theme of MECH-TECH 2024: International Conference on Emerging Trends in Mechanical Engineering, we reaffirm our unwavering commitment to pushing the boundaries and exploring new avenues within Mechanical Engineering. Through dynamic presentations, interactive discussions, and networking opportunities, our aim is to spark innovative solutions and catalyze meaningful change.
I extend my deepest gratitude to our esteemed keynote speakers, distinguished presenters, diligent members of the organizing committee, dedicated volunteers, and partner universities for their invaluable contributions in bringing this event to life. Your expertise, dedication, and passion epitomize the spirit of this gathering.
To all participants, whether seasoned researchers, emerging scholars, industry experts, or enthusiastic students, I encourage you to seize this opportunity to connect with colleagues, cultivate collaborations, and deepen your expertise in your respective fields.
As we begin this rewarding journey together, let's welcome diversity, innovation, and our shared quest for excellence. May this assembly motivate us not just to imagine a brighter tomorrow, but also to actively strive towards its realization.
Thank you for your participation, and I extend my sincerest wishes for a productive & memorable experience at the MECH TECH-24.

Warm regards,
Dr. Prashanth Pai M.
Chair- MECH-TECH – 2024
HoD, Dept. of Mechanical Engineering
PACE, Mangalore

PACE Conclave 2024

ICEST 2024
INTERNATIONAL CONCLAVE ON ENGINEERING SCIENCES & TECHNOLOGY

MECH-TECH
INTERNATIONAL CONFERENCE ON
EMERGING TRENDS IN MECHANICAL ENGINEERING

Message from Conference Convenor

Dear Esteemed Colleagues and Participants,

Welcome to the MECH-TECH 2024: International Conference on Emerging Trends in Mechanical Engineering.

As the Coordinator of this esteemed event, it is my privilege to extend a heartfelt welcome to all participants, both joining us in person or virtually. The essence of this gathering lies in its ability to unite brilliant minds from across the world, facilitating meaningful discussions, sharing state-of-the-art research, and shaping the future of engineering and technology.

At MECH-TECH 2024, we are poised to venture into the frontiers of innovation, discover fresh solutions to pressing challenges, and nurture interdisciplinary collaborations that transcend boundaries. This gathering serves as a guiding light, sparking creativity and propelling progress in our ever-changing world.

I express my sincere gratitude to our esteemed keynote speakers, distinguished presenters, dedicated members of the organizing committee, committed volunteers, and generous sponsors for their unwavering support and contributions. Your collective endeavors have been instrumental in shaping this event into a platform of excellence.

To all participants, I encourage active engagement in discussions, seizing opportunities for collaboration, and tapping into the wealth of knowledge and expertise present at this gathering. Your involvement is pivotal in shaping the outcomes and impact of our collective efforts.

As we embark on this journey of exploration and innovation, let us embrace diverse perspectives, harness the power of collaboration, and strive for excellence in all our pursuits. Together, we possess the potential to enact positive change and propel progress on a global scale.

Thank you for your participation, dedication, and enthusiasm. I wish you all a fulfilling and inspiring experience at MECH TECH-24.

Warm regards,

Dr. Abdul Razak
Convenor
MECH-TECH – 2024
Dept. of Mechanical Engineering
PACE, Mangalore

International Conclave on Engineering Science & Technology (ICEST 24)

MECH-TECH: INTERNATIONAL CONFERENCE ON EMERGING TRENDS IN MECHANICAL ENGINEERING

23rd April 2024 Tuesday – Day 1	
09:30 AM to 11:30 AM	Inauguration of ICEST-24 Inaugural address by **Mr. Sohan M.** Senior Project Manager – Infosys, Mangalore Keynote Address by **Dr. P. Nagabhushan**, VC, Vignan University, AP
11:30 AM to 11:45 AM	Refreshments
11:45 AM to 01:00 PM	Keynote address – I on topic "Interlaminar Fracture Toughness in FRP Composite Laminates -Future Scope and Applications" by **Dr. P. S. Shivakumar Gouda,** Associate Professor, Dept. of Mech., Engg., SDM College of Engg & Tech, Dharwad, India.
01:00 PM to 02:00 PM	Lunch Break
02:00 PM to 02:45 PM	Track 1 Oral presentation (Design and production)
02:45 PM to 03:30 PM	Track 2 Oral presentation (Thermal sciences)
03:30 AM to 03:45 AM	Refreshments
03:45 PM to 04:30 PM	Track 3 Oral presentation (Energy & Environment)
24th April 2024 Wednesday – Day 2	
09:30 AM to 10:30 AM	Track 4 Oral presentation (Materials and Modelling)
10:30 AM to 11:30 AM	Track 5 & 6 Oral presentation (Manufacturing and Machining)
11:30 AM to 11:45 AM	Refreshments
11:45 AM to 01:00 PM	Keynote address – II on topic " Importance of Industry 4.0 in an aerospace domain " by **Dr. Madeva Nagaral, Manager (Design)** Aircraft Research and Design Centre, Hindustan Aeronautics Limited Bangalore-560037, Karnataka-India
01:00 PM to 02:00 PM	Lunch Break
02:30 PM to 03:30 PM	• Valedictory of ICEST-24 • Valedictory address by **Dr. A. M. Khan,** Senior Professor, Dept. of Electronics & Director- Skill Development Centre Mangalore University Mangalore • Keynote Address by **Dr. Surendra Kumar**, Pro-Vice Chancellor, Presidency University, Bangalore
03:30 PM to 04:00 PM	Interaction & High Tea

COMPARISON OF THE TENSILE STRENGTH OF V-GROOVED BUTT-WELDED ALUMINIUM ALLOYS

Pai P M[1], Maruthi Prashanth B H[1], Pujar C V[1], Adithya P N[1*], Jithesh P[1], Fahad P A[1]

[1]Department of Mech. Engg., P. A. College of Engineering, Mangaluru, Karnataka, India.

*Corresponding Author: Adithya P N Email: adithyanagaraj32@gmail.com

Abstract:

Now-a-days shipping, aerospace and process industries commonly use aluminium and its alloys because of their valuable properties such as light weight, better corrosion resistance and weld-ability. This research investigates the influence of groove angle on the tensile strength of Tungsten Inert Gas (TIG) welded AA2024 and AA7075 alloy weldments. The work aims to examine the tensile-strength of V-grooved butt-welded specimens of AA2024 and AA7075 for different groove angles keeping bevel height constant. TIG welding is employed as it joins different materials with high quality in the presence of inert gas. AC power source ensures better cleaning action and avoids the high heat concentration on the material. Tensile strength of the joint is tested by the universal tensile testing machine. From the tensile test conducted on the V-grooved, butt-welded Al-alloys having varying groove angles, it is inferred that the 45˚ angle has the maximum ultimate tensile strength.

Key Words: Groove angle, V-groove, Butt-joint, Bevel height, Root opening, TIG welding, Ultimate tensile strength.

EFFICIENCY IMPROVEMENT OF VERTICAL AXIS WIND TURBINE BY USING MAGNETIC PROPELLING PHENOMENON

Sandesh Hegde[1]*, Ramachandra C G[2], Nagesh S N[3], Prashanth Pai M[4]

[1]Department of Mechanical Engg, Srinivas Institute of Technology, Mangaluru, Karnataka, India.

[2]Department of Mechanical Engg, Presidency University, Bangalore, Karnataka, India.

[3]Department of Mechanical Engg, Ramaiah Institute of Technology Bangalore, Karnataka, India.

[4]Department of Mechanical Engg, P.A. College of Engineering, Mangaluru, Karnataka, India.

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Abstract:

Presently utmost importance for the development of environmentally friendly and affordable alternative energy sources, as the modern civilizations require an affordable, abundant energy for growth. Since the surface of the globe is uneven, different parts of the planet get sunrays of varying intensity. This creates unequal heating of a surface, will results in differences in an environmental air pressure on the surface of the Earth, which causes wind. The wind turbine is a mechanical structure that converts kinetic energy of air into required mechanical form.

As the result of inclusion of features such as 'like polarity magnet repulsion', here the structure will perform even at lower wind speed condition; with greater efficiency. When these magnets are utilized as an additional power source to VAWT structure, they induce a repulsive force which adds kinetic power to the rotor, as they transform the wind kinetic power into the required form of mechanical movement. As a consequence, the Permanent Magnet Propelled VAWT can function at lower wind speed with higher efficiency. In this case, the authors have compared the effectiveness of a regular VAWT to that of its counterpart, the permanent magnet propelling VAWT.

Keywords-: Kinetic energy, repulsive force, VAWT, permanent magnet, efficiency.

FABRICATION AND CHARACTERIZATION OF EPOXY RESIN COMPOSITE MATERIAL REINFORCED WITH BIOFIBRE AND EGG SHELL POWDER AS FILLER MATERIAL

Pai P M[1], Maruthi Prashanth B H[1], Adithya P N[1*], Jithesh P[1], Fahad P A[1] and Muhammed Afreen[1]

[1]Department of Mech. Engg., P. A. College of Engineering, Mangaluru, Karnataka, India.

*Corresponding Author: Adithya P N Email: adithyanagaraj32@gmail.com

Abstract:

The identification of ecofriendly and sustainable fibres is paving the way for the creation of workable substitutes for various applications, particularly in the field of composites. The objective of this study is to investigate the development of hybridized epoxy-based polymer composites, using Banana leaf fibre and bio-fillers made from eggshells, adhering meticulously to ASTM standards during specimen creation and mechanical analysis. The resulting composites are have improved mechanical properties, such as increased strength and stiffness, which are essential for their use in high mechanical pressure and wear applications. Overall, this study aims to contribute to the growing body of research on sustainable materials by investigating the potential of using Banana leaf fibers and eggshell bio-fillers in epoxy-based polymer composites.

Key Words: Epoxy-based polymer composites, biofillers, composites, ASTM standards

THERMAL ANALYSIS OF THREE-TUBE HEAT EXCHANGER USING WATER & HYBRID NANOFLUID

Bhavish S Ail[1], Sheikh Mohammed Rahil[1], Muhammed Afsal C[1], Suheb Alam Khan[1], Abdul Razak[1*]

[1]Department of Mechanical Engineering, P. A. College of Engineering, Mangaluru, Karnataka-574153, India.

*Corresponding Author: Abdul Razak Email: arzmech2@gmail.com

Abstract:

Heat exchangers have a broad range of engineering applications and are crucial to many industrial processes. The development of efficient heat exchangers is a result of growing awareness of the efficient use of energy resources, minimizing operating costs, and maintenance-free operation. The triple fluid heat exchanger that is being shown here is a better double pipe heat exchanger in which two concentric straight tubes are separated by a helical tube. Using the three fluid combinations of hot water, normal water, and air, the impact of variations in fluid volume flow rates on heat transfer performance was examined. Subsequently, an analysis was conducted using nano fluids. It was discovered that using nanofluids improved heat transfer performance.

Key Words: Nusselt number, Heat Transfer, Three fluid heat exchanger.

NUMERICAL ANALYSIS OF CONJUGATE HEAT TRANSFER IN A TURBULENT FLOW

Suneel Mudeppanavar[1], Pradeep Shegani[1], S.G. Cholake[1]*

[1]Department of Mechanical Engineering, BLDEA's V. P. Dr. P. G. Halakatti College of Engineering and Technology in Vijayapura, Karnataka.

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Abstract:

Conjugate heat transfer in a turbulent flow will be solved numerically by using ANSYS Fluent the set of governing equation will be studied by Finite volume method (FVM). The Dirichlet type boundary condition will be used to solve flow and energy equation. Simulating will be performed for various cases of varying flow and material properties. For all the cases heat transfer rates will be studied and the variation of Nusselt number (Nu) with Reynolds number will be analyzed.

Key Words: Conjugate heat transfer, turbulent, FVM.

EVALUATION OF PHYSICAL AND MECHANICAL PROPERTIES OF CHICKEN FEATHERS AND WOOD APPLE SHELL POWDER REINFORCED BIO-DEGRADABLE HYBRID COMPOSITES

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Abstract:

Fabric Natural waste materials are gaining popularity as fillers in composites alternative to manufactured fillers due to their promise as a low-cost, environmentally friendly. Chicken feathers, a byproduct of the poultry business, are mostly made of keratin, a protein that can improve the mechanical characteristics of composites. Wood apple shells are a natural waste material that has gained popularity as a viable filler for composite materials due to its availability, low cost, and appealing properties. The lignocellulosic nature of wood apple shells gives them exceptional mechanical strength, thermal stability, and water resistance, making them an appealing option to synthetic fillers. In this study, an attempt was made to manufacture a composite material using wood apple shell and chicken feathers powder in varied amounts, and the resulting composites were examined for physical and mechanical qualities such as tensile and flexural strength. The study's findings demonstrated that the composite made from varied combinations of wood apple shell, and chicken feather powder may exhibit rather acceptable properties. The utilization of these natural materials can lessen the environmental impact of traditional plastic-based composites while also providing a cost-effective and sustainable alternative. The findings of this study can help to design environmentally friendly materials and promote a more sustainable future.

Keywords: Composite material, Wood apple shell, chicken feather, Mechanical testing.

EVALUATION OF MECHANICAL PROPERTIES AND CHARACTERISTICS OF BAMBOO FIBERS REINFORCED WITH POLYMER MATRIX COMPOSITE

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Abstract:

Polymeric material reinforced with synthetic fibers such as glass, carbon and aramid offer the advantages of higher stiffness and strength to weight ratio as compared to conventional construction material like wood, concrete and steel. Despite these advantages, the wide spread use of synthetic fiber reinforced to polymer composites has a tendency to decline because of their high initial cost and adverse environmental impact. In recent years the natural fiber composites have attracted substantial importance among the structural materials there has been a fast-growing interest in using the natural fibers as reinforcement in the composites, the attractive features of natural fibers are their low cost, lightweight, high specific modulus, renewability and bio-degradability. This work on the mechanical properties of sodium hydroxide (NaOH) treated and untreated bamboo fiber reinforced polymer matrix composites. The hybrid composites were prepared by traditional hand layup method at room temperature with an applied pressure for about 24hrs pressurization time. Mechanical properties like tensile strength, tensile modulus, flexural strength and flexural modulus have been measured according to ISO standards, for both treated and untreated fiber reinforced matrix composites.

Keywords: Polymer matrix composite, bamboo fibers, Mechanical testing.

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DESIGN AND FABRICATION OF AN AUTOMATED SOLAR GRASS CUTTER

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Abstract:

In today's world, automation is a very important part of innovation. It is an innovative and technologically advanced solution for lawn maintenance - an automated solar grass cutter featuring ultrasonic sensors for object detection and a vacuum system for efficient grass collection. By harnessing solar energy, this system reduces dependency on conventional power sources, while minimizing carbon emissions. The incorporation of intelligent algorithms, coupled with ultrasonic sensors, ensures precise grass cutting and reliable detection of obstacles. Simultaneously, the integrated vacuum system efficiently collects the cut grass. The design of the device prioritizes durability, complemented by essential safety. Through the integration of sustainable energy sources, ultrasonic sensors for object detection, and effective grass collection mechanisms, this solution promotes eco-friendly practices, enhances operational efficiency, and reduces environmental impact in lawn care.

Key Words: Solar Energy, Grass Cutter, Ultrasonic Sensor, Vacuum suction.

BIOSYNTHESIS OF SILVER NANOPARTICLES FROM AZADIRACHTA INDICA FOR ANTI-CORROSION ACTIVITY

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Abstract:

This study investigates the biosynthesis of silver nanoparticles (AgNPs) using Azadirachta indica (Neem) extract and evaluates their potential as anti-corrosion agents. The green synthesis method offers an eco-friendly and cost-effective approach for the production of nanoparticles. Characterization techniques such as UV-Vi's spectroscopy, Fourier-transform infrared spectroscopy (FTIR), scanning electron microscopy (SEM), and X-ray diffraction (XRD) were employed to analyze the synthesized AgNPs. The results revealed the successful formation of spherical AgNPs with an average size in the nanometer range. Furthermore, the anti-corrosion activity of the synthesized AgNPs was assessed using electrochemical impedance spectroscopy (EIS) and potentiodynamic polarization techniques. The findings demonstrate promising anti-corrosive properties of the AgNPs, suggesting their potential application in corrosion inhibition across various industrial sectors. This study contributes to the growing body of research exploring sustainable nanomaterials for corrosion mitigation and underscores the significance of utilizing natural resources for nanoparticle synthesis with beneficial industrial applications.

Key Words: Silver nanoparticles, Azadirachta indica, Anti-corrosion activity, green synthesis, Characterization

DESIGN AND FABRICATION OF FERTILIZER MIXING AND DISPENSING MACHINE

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Abstract:

Farming is often associated with hard physical labour, long hours, and uncertain income, which may deter younger generations who seek more stable and less physically demanding career paths. Also, rapid urbanization and changing lifestyles have led to disconnect between younger generations and rural life. Many young people are drawn to urban areas for education, employment opportunities, social activities, and access to modern amenities, which may lead them to pursue careers outside of agriculture. On field factors concerned, labour scarcity has emerged as one of the foremost challenges in farming. All the agro-farming affected, taking coastal region concerned; arecanut demands skilled labours thus affected much. Problems associate from manuring, watering and harvesting, mostly areca plants demand necessary minerals/compost and labourers are required to carry out this process in time. Problems of carrying, dispensing and commute inside the fields need to be addressed. Despite these challenges, there is growing recognition of the importance of attracting and retaining young people in agriculture to ensure the sustainability and resilience with the trend. Efforts to promote agriculture mechanization are the only options.

The project aims in design and development of fertilizer mixing and dispensing machine for areca and other allied farming activities. It is a combination of a hand cart, compost blending machine and compost dispensing machine. The unit is powered by a 160 cc Honda engine. The compost is dumped inside through the feed hopper leading to mixing chamber, wherein the mixing is done thoroughly. The machine also featured with quantifies dispensing technique added with IoT features. Field testing and ease of operation regardless of age and gender is focussed.

Key Words: Areca Farming, Automation, Mechanization, Compost, Dispensing.

DESIGN AND FABRICATION OF CHAFF CUTTER CUM FLOUR MILL, FOR SMALL FARMERS

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Abstract:

The optimization of a combined chaff cutter and flour mill machine involves enhancing efficiency and performance. This abstract focuses on refining the design, materials, and operational parameters to achieve maximum output and resource utilization. Through systematic experimentation and analysis, the study aims to identify optimal configurations, minimizing energy consumption while maximizing chaff cutting and flour milling capabilities. The results contribute to the development of a more sustainable and effective agricultural processing solution, catering to the needs of farmers and promoting resource- efficient practices in food production. The scope of chaff cutter focuses on the chopping of agricultural wastes such as coconut leaves, areca leaves, etc., and this chopped waste can then be used to prepare vermin compost, cattle feeds, and floor stuff for cattle huts. The scope of the flour mill is to grind the grains used for daily purposes. It uses combined blades for grinding. The friction generated between the blades and casing results in grinding the grains into powder. At last, it can be stored for the daily use.

Key Words: Fodder, Cutter, Uniform chopping, Grinding

AN EXPERIMENTAL INVESTIGATION ON RC BEAM RETROFITTING WITH A SUSTAINABLE NATURAL FRP HYBRID COMPOSITE SYSTEM TO IMPROVE SHEAR PERFORMANCE

Archana D. P[1*], Chetan Chandru[1], Rashmi R[1]., Thanuja H. P[1]., Hemalatha K[1]

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Abstract:

Nowadays, it's common practice to strengthen structural components in order to support the additional loads associated with adopting current structural standards and zonal adjustments. Therefore, rather than completely destroying and rebuilding the structure, which would not be cost-effective, it is important to strengthen the structural capacity of such buildings. In this experimental inquiry, natural fibre reinforced polymers (NFRP) have been employed as a wrapping member with 90° and 45° strip wrapping configurations to strengthen reinforced concrete beams. An example of this type of material is sisal-jute hybrid fabric (sisal:jute::80:20 ratio). The ultimate load bearing capacity and maximum deflection of the sisal-jute FRP-stirred RC beams were measured and compared with those of the unstrengthened RC beams. The results of the experiment showed that, when compared to control beams, the load bearing capacity of 90° and 45° strip wrapping had been significantly increased by around 30% and 15%, respectively. Compared to control beams, the deflection sustained by reinforced beams with 90° strip wrapped beams is 30% more. In addition, the water absorption, chemical and heat treatment, and fire resistance test in compliance with requirements have all been examined in relation to the damage and degradability of FRP material. It was demonstrated that sisal-jute fiber-reinforced polymer (FRP) strengthening has enormous potential as a structural strengthening material since it demonstrated a good increase in shear strengths, delayed the formation of cracks, and improved the load deflection behaviour in comparable magnitudes to that of control beams.

Keywords: RC beams, FRP system, Retrofitting, Ultimate load carrying capacity.

DESIGN AND FABRICATION OF A PARABOLIC TROUGH SOLAR COLLECTOR FOR WATER HEATING SYSTEM

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Abstract:

The development and construction of a parabolic trough solar collector for water heating systems represent an innovative and efficient solution for utilizing solar energy to fulfill the heating requirements of residential, commercial, and industrial sectors. During the design phase of the parabolic trough collector, meticulous attention is paid to numerous factors to maximize its performance. A pivotal aspect involves selecting materials that exhibit high reflectivity, durability, and resistance to corrosion. Typically, materials such as highly reflective mirrors, reflective film coatings, or polished metal sheets are chosen. These materials facilitate efficient absorption of sunlight and minimize losses attributable to reflection or absorption by the collector surface. Other factors are also considered to improve the efficiency of the collector.

Key Words: Nanomaterial, Graphene oxide, Solar Energy.

THERMAL PERFORMANCE ENHANCEMNT OF A MINI RADIATOR USING HYBRID NANOFLUIDS

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Abstract:

The aim of this study is to investigate the enhancement of heat transfer in an automobile radiator by using a water-based graphene hybrid nanofluid as the coolant. Water serves as the base fluid, with nanofluid concentrations ranging from 0.2 percent to 0.6 percent volume concentration. The radiator utilized is of the cross-flow unmixed type. Analyses were conducted at various flow rates, and experimental readings were taken after achieving steady-state conditions under forced flow. Parameters such as Nusselt number, friction factor, pressure drop, and pumping power were examined to assess heat transfer efficiency. Results revealed that the convective heat transfer coefficient of nanofluids and the Nusselt number increase with mass flow rate, accompanied by rises in pressure drop and pumping power.

Key Words: Automobile radiator, forced flow, heat transfer, nanofluids, pumping power.

STRUCTURAL ANALYSIS OF BAMBOO REINFORCED COMPOSITE MATERIAL

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ABSTRACT:

For centuries, wood has been a staple material in construction worldwide. Alongside it, bamboo boasts a rich history in tropical and sub-tropical regions for its construction versatility. In today's climate-conscious era, bamboo emerges as a vital resource. Its remarkable carbon-sequestering properties make it an invaluable ally in mitigating greenhouse gas emissions and reducing carbon footprint. Bamboo stands out as a promising building material primarily due to its exceptional tensile strength and impressive weight-to-strength ratio. The natural bamboo may have tensile strength in the range of 80 to 120 N/mm^2. The present work aims to increase the tensile strength of bamboo by mechanical means. The composite material of bamboo is obtained by bundling the bamboo fibers using geo fabric thread in the presence of suitable epoxy resin (LY 556) and hardener (HY 951). The study also concentrates on finding the effect of different patterns of threading in the process of forming bamboo fiber roads. The study reveals closest forms of threading have given better results than the other forms of threading. This process is effective in increasing the tensile strength of bamboo composite material by 57 to 100%.

Key Words: Bamboo fiber, Epoxy Resin, Hardener, Tensile Strength.

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Message from Conference Chair

Dear Esteemed Colleagues,

It is my honor to welcome you to the proceedings of the International Conference on Civil Engineering (IC-ICE). As the Chair of this prestigious event and the Head of the Department of Civil Engineering at PACE, Mangalore, I am delighted to witness the convergence of minds from around the globe to exchange insights, innovations, and advancements in our field.

This conference serves as a platform for researchers, scholars, and practitioners to collaborate, share knowledge, and foster partnerships that will shape the future of civil engineering. I extend my heartfelt gratitude to all participants for their contributions and dedication to advancing the boundaries of our discipline.

I am confident that the presentations, discussions, and interactions during IC-ICE will not only enrich our understanding but also inspire new avenues of research and development. Together, let us embark on this journey of exploration and discovery, driving progress and excellence in civil engineering.

Warm regards,

Dr. Palakshappa K.
Chair - IC-ICE
HoD, Dept. of Civil Engineering
PACE, Mangalore

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Message from Conference Convenor

Dear Esteemed Colleagues and Participants,

Welcome to the IC-ICE-24: International Conclave - In Civil Engineering, under the umbrella of PACE CONCLAVE: International Conclave on Engineering Sciences & Technology – 2024 (ICEST-24).

As the Convenor of this esteemed event, it is my privilege to welcome all attendees, whether joining us in person or virtually. The essence of this gathering lies in its capacity to unite brilliant minds from across the globe, facilitating meaningful discourse, sharing cutting-edge research, and collectively shaping the future of engineering and technology.

Under the IC-ICE-24, we are poised to explore the frontiers of innovation, uncover novel solutions to pressing challenges, and foster interdisciplinary collaborations that transcend boundaries. This conclave serves as a beacon of inspiration, igniting the spark of creativity and driving progress in our ever-evolving world.

I extend my heartfelt gratitude to our esteemed keynote speakers, distinguished presenters, dedicated members of the organizing committee, committed volunteers, and generous sponsors for their unwavering support and invaluable contributions. Your collective efforts have been instrumental in shaping this event into a platform of excellence.

To all participants, I encourage you to actively engage in the discussions, seize opportunities for collaboration, and leverage the wealth of knowledge and expertise present at this conclave. Your involvement is pivotal in shaping the outcomes and impact of our collective endeavors.

As we embark on this journey of discovery and innovation, let us embrace diversity of thought, harness the power of collaboration, and strive for excellence in everything we do. Together, we have the potential to effect positive change and drive progress on a global scale.

Thank you for your participation, dedication, and enthusiasm. I wish you all a rewarding and inspiring experience at the IC-ICE -24.

Warm regards,

Dr. Praeen Suvarna
Convenor
IC-ICE-24
Associate Professor
Dept. of Civil Engineering, PACE, Mangalore

International Conclave on Engineering Science & Technology (ICEST 24)

IC-ICE 2024: INTERNATIONAL CONCLAVE - IN CIVIL ENGINEERING

23rd April 2024 Tuesday – Day 1	
09:30 AM to 11:30 AM	Inauguration of ICEST-24 Inaugural address by **Mr. Sohan M.** Senior Project Manager – Infosys, Mangalore Keynote Address by **Dr. P. Nagabhushan**, VC, Vignan University, AP
11:30 AM to 11:45 AM	Refreshments
11:45 AM to 01:00 PM	Keynote address – I on topic "Sustainable Smart Cities: What Lies Ahead? " by **Dr. Jagdish H Godihal,** Professor- CIVIL and Deputy Dean-Academic Research, Presidency University Bengaluru, Karnataka.
01:00 PM to 02:00 PM	Lunch Break
02:00 PM to 02:45 PM	Track 1 Oral presentation (Transportation and Geotechnical Engineering)
02:45 PM to 03:30 PM	Track 2 Oral presentation (Building Materials and Construction Technology)
03:30 AM to 03:45 AM	Refreshments
03:45 PM to 04:30 PM	Track 3 Oral presentation (Architecture and Planning)
24th April 2024 Wednesday – Day 2	
09:30 AM to 10:30 AM	Track 4 Oral presentation (Structural Engineering)
10:30 AM to 11:30 AM	Track 5 & 6 Oral presentation (Sustainability and Environmental Engineering & Water Resources and Irrigation Engineering)
11:30 AM to 11:45 AM	Refreshments
11:45 AM to 01:00 PM	Keynote address – II on topic "Sustainable Horizons in Civil Engineering" by **Dr H Ajith Hebbar,** Associate Professor & Head, Civil Engg. Alva's Institute of Engineering and Technology, Moodbidri
01:00 PM to 02:00 PM	Lunch Break
02:30 PM to 03:30 PM	• Valedictory of ICEST-24 • Valedictory address by **Dr. A. M. Khan,** Senior Professor, Dept. of Electronics & Director- Skill Development Centre Mangalore University Mangalore • Keynote Address by **Dr. Surendra Kumar**, Pro-Vice Chancellor, Presidency University, Bangalore
03:30 PM to 04:00 PM	Interaction & High Tea

TO DEVELOP A NEARLY ZERO ENERGY BUILDING USING BIM AND AR

Fathimath Hanna[1], Mahamad Asif S[1], Abdul Shaheed Kaiseeran[1], Aboobacker Muzammil[1], Praveen Suvarna[1*]

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ABSTRACT:

A Net Zero-Energy Building (NZEB) is a building with net zero energy consumption, meaning the total amount of energy used by the building on an annual basis is equal to the amount of renewable energy created on the site.There are only a limited number of buildings that use the concept of NZEB at present. The construction of NZEBs is becoming more and more feasible owing to advancements in building technology, renewable energy systems and academic research.The current project aims to conceptualise a residential building that uses the concept of NZEB. With the combination of BIM and AR technology, the concept of NZEB can be achieved in a maximum reasonable way.As we visualise the building, the energy optimisation of the building can be done in a better manner in the present and future than in the past due to the advancement in the technology like Building Information Modelling (BIM) and Augmented Reality (AR).Together BIM and AR can be used as tools to help in designing, constructing and operating the NZEB. By providing detailed visualisation, energy analysis and real-time data, BIM and AR helps in optimising the building performance and achieving the NZEB goals.

Key Words: Building Information Modelling, Augmented Reality. Net Zero Energy Building

STRENGTH PARAMETERS OF CONCRETE BY USING BIO-CEMENT

Praveen Suvarna[1*], Athmadev B[1]

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Abstract:

Concrete is the most consumed artificial cementitious material because of rapid urbanization. Modern concrete is not sustainable and is one of the biggest causes of anthropogenic greenhouse gas emissions. A possible technique to imitate nature's sustainability methods is through microbial precipitation of $CaCO_3$. In the present work, an attempt is made to create concrete using Bacteria by Microbial induced Calcite Precipitation (MICP) method. By using a certain species of bacteria from the order of Bacillales. In the present study, BacillusCohniibacteria is used.The test results indicate that in the presence of Bacillus Cohnii bacteria media is insufficient to create concrete only using GGBS and fly ash. The study indicates a minimum use of 30% of cement is obvious for making concrete using Bacillus Cohnii bacteria. The compressive test results shows Bacillus cohnii bacterial may contribute 2% to 4% increase in compressive strength of concrete. The compressive strength of the mixture with 30% cement, 50 % GGBS, and 20% Fly ash is nearly in the range of concrete using 100% cement.

Key Words: Bio-Cement, Microbial induced Calcite Precipitation, Bacillus Cohnii.

THE RATE OF POROSITY OF DIFFERENT TYPES OF SOIL IN KONAJE REGION

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Abstract:

Understanding soil porosity is crucial for agricultural productivity, water management, and environmental sustainability. This study investigates the rate of porosity across various soil types in the Konaje region, aiming to provide insights into soil quality and its implications for land use planning. The research employs a systematic sampling method to collect soil samples from different locations within the Konaje region. These samples represent diverse soil types prevalent in the area, including clayey, sandy, and loamy soils. Porosity measurements are conducted using standard laboratory techniques, including gravimetric and volumetric methods.Preliminary findings indicate significant variations in porosity levels among different soil types. Clayey soils exhibit lower porosity due to their fine particle size and high compaction, limiting water infiltration and root penetration. Sandy soils, characterized by larger particles and lower compaction, display higher porosity, facilitating better drainage but potentially leading to nutrient leaching. Loamy soils, with a balanced composition of sand, silt, and clay, demonstrate intermediate porosity levels, offering a favorable environment for plant growth and nutrient retention. This study contributes to the understanding of soil characteristics in the Konaje region and provides valuable information for agricultural practitioners. Further research is warranted to explore the long-term effects of soil porosity on crop yields, water availability, and ecosystem resilience in Konaje and similar agro-ecological contexts.

Keywords: Soil, Porosity, Konaje, Engineering properties, Agricultural

USAGE OF FILLER TILE OR MARUTHY TILE IN AND AS A PART OF CONCRETE

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Abstract:

Innovative and reasonably priced filler slab technology reduces the encumbrance of a slab by partially replacing the concrete with filler material. It describe the usage of filler tiles as a fundamental component of concrete slabs and their advantages and disadvantages. Filler slabs are added to concrete slabs to improve structural performance, aesthetic appeal and sustainability, among other benefits. Concrete slabs potential as a versatile building material can be fully realized by incorporate filler tiles into them.

This study examines the number of filler tile usage related topics - such as, appropriate tile type selection, Installation methods, and the effect of filler tile qualities on slab characteristics. This project aims to estimate amount of concrete and steel saved as a result of usage of filler in the RCC slab, study the structural behavior of the filler slab, and to compare the heat insulation properties of filler slab with conventional RCC.

According to the study's findings, filler tiles help the concrete slabs load bearing capacity,minimize its risk of crackingand improve the durability. Additionally infill tiles can improve the slab's aesthetic appeal by enabling customized designs and patterns.By minimizing the waste and utilizing the recycled or re purposed materials,the usage of filler tiles also encourages sustainable practices. Overall this research highlights the significance of using filler tiles as a practical way to improve structural performance, aesthetics, and sustainability in building projects.

Keywords: Filler slab, RCC, structural performance, sustainability load bearing capacity,

CLIMATE CHANGE AND ANTHROPOGENIC IMAPCTS ON WETLAND AND AGRICULTURE IN GURUPURA RIVER BASIN

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Abstract:

Climate change is identified as a major threat to wetlands. Altered hydrology and rising temperature can change the biogeochemistry and function of a wetland to the degree that some important services might be turned into disservices. This review paper assesses the potential response of natural wetlands (peat lands) and constructed wetlands to climate change in terms of gas emission and nutrients release. In addition, the impact of key climatic factors such as temperature and water availability on wetlands has been reviewed. The topic selected is "Estimating the Potential Evapotranspiration using Temperature and Runoff for wetland in Gurupura River Basin" Dakshina Kannada district, Karnataka. The hydrological data were collected from different government organizations and IMD (Indian metrological Department). The well observation data were collected for last ten years by taking the monsoon and non-monsoon water levels from ground surface. The Potential Evapotranspiration is estimated for those years. The objective of the research program is to be performing Evapotranspiration analysis, to estimating and finding the new numerical relationship between rainfall and temperature and Potential Evapotranspiration and Temperature.

Keywords: Evaluation, Temperature, Potential Evapotranspiration, Rainfall variation graphs.

VERMICOMPOSTING BY VERMIREACTOR IN PACE CAMPUS

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Abstract:

The traditional method of vermin composting has drawbacks in terms of processing time and space adaptation. By designing and building a rotary drum vermin composter, this study attempts to overcome these difficulties. By maximizing aeration and moisture distribution, the rotary drum's creative design speeds up the decomposition process by enabling the effective mixing of waste materials. By removing the spatial limitations that are frequently connected to traditional technologies, this small and transportable vermin composter offers a workable option for urban settings and small-scale waste generation. More people are adopting and learning about effective composting techniques due to the well-thought-out design and simple operation. The study yielded notable results, such as a notable reduction in composting time 25-30 days as opposed to 45-60 days for standard procedures, increased space usage, and greater waste management. After the composting is done, we get vermiwash and vermin compost as the end product which can be later used for gardening or vegetation, and can also increase the fertility of the soil.

Key Words: Vermicomposting, Rotary drum vermin composter, Aeration, Decomposition, Composting time reduction, vermiwash**.**

LAND BASED FISH FARMING BY RECIRCULATING AQUACULTURE SYSTEM TECHNOLOGY

Prof.Jameela[1*], Arfan Shabeeb [1], Mohammed Adnan[1], Mohammed Sharafath [1], Kadeejath Mizwana Shireena M [1].

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Abstract:

The fastest-growing industry for producing food in the world is aquaculture, which is the regulated or semi-controlled cultivation of aquatic animals and plants. so far, numerous technologies have been developed to improve the system. This research paper demonstrates the cultivation of fishes by Recirculation Aquaculture System (RAS). Due to the fact that aquaculture ponds produce little waste, the Recirculation Aquaculture System (RAS) is a far superior solution with little negative environmental effects .It is a method of raising aquatic creatures that relies on both mechanical and biological filters to reuse the water used in the production process. Along with reducing water use and disease risk, RAS also enhances feed conversion, shortens the production cycle, and serves as a water treatment system. Additionally, the farmer may gain from the application of RAS to clay ponds and natural systems.

Key words: Aqua culture, RAS, biological filter, mechanical filter, clay ponds

EFFECT OF JAMUN LEAVES AND BACTERIA ON THE COMPRESSIVE STRENGTH OF BIO BRICK

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Abstract:

Bio-bricks, also known as biological bricks or bio-based building materials, are innovative construction materials made from renewable and sustainable resources such as agricultural waste, plant fibers, or biopolymers derived from plants or microorganisms. These materials offer numerous advantages over traditional building materials, including lower environmental impact, improved energy efficiency, and reduced reliance on non-renewable resources.Bio-bricks are eco-friendly products where there is no harm to the environment. This study investigated the impact of incorporating Jamun leaves and bacteria on the compressive strength of bricks. Initially, minimal effects were observed due to the low percentage of both Jamun leaves and bacteria. However, as the percentage of these materials increased, a slight improvement in compressive strength was noted. Furthermore, the addition of Ground Granulated Blast Furnace Slag (GGBS) resulted in a notable increase of 1.33 N/mm^2 in compressive strength. These findings suggest that while the direct influence of Jamun leaves and bacteria was limited in phase 1, their effects became more pronounced with higher concentrations. Moreover, the incorporation of GGBS showed promising results in enhancing the compressive strength of the bricks.

Keywords: Bio Brick,Activators,JamunLeaves, Bacteria,GGBS.

BARRIERS IN USING PLASTIC AS FINE AGGREGATE IN CONCRETE

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ABSTRACT:

The integration of plastic waste as a substitute for fine aggregate in concrete holds significant promise for mitigating environmental concerns associated with plastic disposal while enhancing the sustainability of construction materials. However, despite its potential benefits, the widespread adoption of this innovation encounters several barriers. This research aims to identify and analyze these impediments through a multi-faceted approach. Initially, a comprehensive literature review was conducted to examine existing studies, methodologies, and challenges pertaining to the incorporation of plastic as fine aggregate in concrete. Subsequently, a pre-survey questionnaire was administered to industry experts, engineers, and researchers to gauge their perspectives and identify key concerns regarding the use of plastic in concrete. Based on the insights gained from the pre-survey phase, a main questionnaire survey was designed and administered to a broader sample population involved in the construction sector. The main questionnaire focused on assessing perceptions, regulatory hurdles, technical challenges, management level concerns and economic considerations related to the utilization of plastic as fine aggregate in concrete. Data collected from both the pre-survey and main questionnaire were analyzed using statistical techniques. The results of the research shed light on a spectrum of barriers inhibiting the widespread adoption of plastic as fine aggregate in concrete, including but not limited to concerns regarding material properties, structural performance, durability, regulatory frameworks, public perception, and economic feasibility. Furthermore, the study offers valuable insights into potential strategies and solutions to address these barriers.In conclusion, this research provides a comprehensive understanding of the challenges hindering the utilization of plastic waste in concrete production, thereby facilitating informed decision-making and guiding future research and policy initiatives aimed at promoting sustainable construction practices.

Key Words: Plastic waste, Concrete, Barriers, Challenges, Waste management, Sustainable development.

Partial Replacement of Fine Aggregate Using Glass Powder and Course Aggregate Using Crushed Concrete in Concrete Brick

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ABSTRACT:

Cement concrete is one of the most commonly used materials in modern buildings. The evolution of technology and contemporary living habits has caused a surge in the production and diversity of waste, resulting in a crisis in waste management. This research addresses the issue of waste originating from construction activities, such as discarded concrete and glass. To mitigate the accumulation of specific types of waste, there is a suggestion to repurpose some of these materials by integrating them as substitutes for a portion of the primary constituents in cement concrete blocks utilized in construction endeavors. This research investigates the feasibility of partially replacing fine aggregate with glass powder and coarse aggregate with crushed concrete in the production of concrete bricks. The study focuses on replacing fine aggregate with glass powder at 10% and 20% levels, and replacing coarse aggregate with crushed concrete at 10%, 20%, and 30% levels. The compressive strength of the resulting concrete bricks was evaluated to assess the feasibility and potential benefits of these substitutions. Experimental tests were conducted to measure the compressive strength of concrete bricks with varying replacement levels of glass powder and crushed concrete. The results indicate that the partial replacement of fine aggregate with glass powder and coarse aggregate with crushed concrete does not significantly compromise the compressive strength of the concrete bricks. Furthermore, the research demonstrates that replacing fine aggregate with glass powder and coarse aggregate with crushed concrete can potentially enhance the sustainability of concrete production by utilizing wastematerials.

Key Words: Concrete bricks, Fine aggregate, Glass powder, Coarse aggregate, Crushed concrete, Compressive strength, Sustainability.

DESIGN OF ROOFTOP RAINWATER HARVESTING FOR P. A. IBRAHIM HAJI MEMORIAL PHYSIOTHERAPY CENTER, NADUPADAVU, MANGALURU, DAKSHINA KANNADA DISTRICT, KARNATAKA

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Abstract:

Water is known as the elixir of life due to its importance in the lives of living creatures. The rapid increase in population, changed climatic conditions, frequent occurrences of floods, draughts, etc., caused the scarcity of water in many regions of the world. So, to fulfil the requirements of water supply for domestic purposes, there is great demand and scope for rooftop rainwater harvesting. In the present work, an attempt is made to design the rooftop rainwater harvesting system for Dr. P. A. Ibrahim Haji Memorial Physiotherapy Centre, Nadupadavu, Mangaluru, with the objective of harvesting the rooftop rainwater and using it for domestic purposes and groundwater recharge. The annual volume of water to be collected to be collected from the rooftop is obtained using the area of the rooftop and the average annual rainfall in the region. The sizes of the gutters and downpipes are provided based on the rooftop area, rainfall and intensity of rainfall as per the guidelines of IS 15797:2008. A provision is made for the first flush system and filtration to remove substances causing pollution of the water. Excess water flowing out of the tank is directed to flow into the infiltration pit, which helps to induce the groundwater recharge. The storage tank is designed, and a cost analysis is done. It is evident from the study that rooftop rainwater harvesting is a very viable, reliable, and economical method to supply water for domestic and groundwater recharge. Also, it is one of the ways forward for sustainable utilization of water resources.

Key Words: Rooftop, Rainwater harvesting, Gutters, Downpipes, Storage tank, Infiltration pit

STABILIZATION OF EXPANSIVE SOIL USING INCINERATOR HOSPITAL WASTE ASH

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Abstract:

Expansive soils pose significant challenges in geotechnical engineering due to their high swelling potential and low bearing capacity. This study investigates the effectiveness of utilizing incinerator hospital waste ash (IHWA) as a sustainable stabilizing agent for expansive soils. The IHWA, a byproduct of hospital waste incineration, is rich in pozzolanic materials and possesses potential for soil stabilization applications. In the present study, a biomedical waste incinerator ash and lime combination was proposed to stabilize expansive soil. Particle size analysis, Atterberg limits, free-swell, compaction, unconfined compression strength, and California bearing ratio tests were conducted on the natural soil and blended with 3%, 5%, 7%, 9%, and 11% biomedical waste incinerator ash (IHWA). The results indicate that the addition of IHWA leads to improvements in the plasticity characteristics, compaction parameters, and strength properties of the expansive soil. Furthermore, the incorporation of IHWA resulted in a reduction in the swelling potential of the treated soil, thus mitigating the detrimental effects of moisture variation. The microstructural analysis revealed the formation of pozzolanic reactions and cementitious compounds within the soil matrix, contributing to the enhancement of soil stability. Overall, the findings suggest that IHWA shows promise as an environmentally friendly and cost-effective alternative for stabilizing expansive soils, offering sustainable solutions for construction projects while addressing the challenges associated with hospital waste management.

Keywords: Expansive soil, Stabilization, Incinerator hospital waste ash (IHWA), Engineering properties, Sustainable construction.

HYDROPONICS FARMING: The technology towards sustainability

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ABSTRACT:

Hydroponic farming is experiencing a surge in global interest due to its ability to optimize resource utilization and produce high-quality crops. In contrast, traditional soil-based agriculture confronts a host of difficulties, including urban expansion, environmental catastrophes, shifting climates, and the overuse of chemicals, all of which contribute to soil degradation and fertility loss. This article explores different types of hydroponic setups, such as wick, ebb and flow, drip, deep water culture, and Nutrient Film Technique (NFT), detailing their functions, advantages, and drawbacks. It delves into their effectiveness in cultivating various crops like tomatoes, cucumbers, peppers, and leafy greens, while also highlighting water conservation achieved through this method. Notable benefits include accelerated crop growth compared to traditional methods, year-round production, reduced susceptibility to diseases and pests, and the elimination of tasks like weeding, spraying, and watering. The NFT technique has gained widespread adoption in commercial settings globally, proving highly effective in the production of leafy greens and various vegetables. It boasts impressive water savings, typically ranging from 70 to 90%, further underlining its significance in sustainable agriculture.

Key Words: Hydroponics, Vertical Farming, Agriculture, PH Control, Market cost.

TENSILE STRENGTH ENHANCEMENT OF BAMBOO FIBER USING MECHANICAL METHODS

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ABSTRACT:

For centuries, wood has been a primary material in global construction. In tropical and sub-tropical regions, bamboo has also played a significant role due to its versatility. In our current climate-conscious era, bamboo has emerged as a vital resource. Its exceptional ability to sequester carbon makes it invaluable in mitigating greenhouse gas emissions and reducing our carbon footprint. Bamboo is a promising building material due to its outstanding tensile strength and impressive weight-to-strength ratio. Natural bamboo can have a tensile strength ranging from 80 to 120 N/mm^2, making it an excellent choice for sustainable construction. The objective of this research is to enhance the tensile strength of bamboo through mechanical methods. The composite material is created by bundling bamboo fibers using geofabric thread, along with an appropriate epoxy resin (LY 556) and hardener (HY 951). The study also investigates the impact of various threading patterns on the formation of bamboo fiber composites. The results indicate that closely spaced threading patterns yield superior results compared to other threading patterns. This process effectively increases the tensile strength of bamboo composite materials by 57% to 100%.

Key Words: Bamboo fiber, Epoxy Resin, Hardener, Tensile Strength.

A REVIEW ON GIS BASED APPROACH OF URBAN TRANSPORTATION NETWORK ANALYSIS

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Abstract:

The Urban areas are widely spread with more connected road networks. There are many studies shows the impact of urban transportation on economic development of a country. Urban transport provide the mobility of people, goods and access to the public with their amenities, like hospital, education, employment, health, entertainment etc,. Many cities are not providing sufficient road network accessibility in India, these cause transportation problems. In India, many initiatives/polices are taken by Government to address the urban transportation problems. These problems are mainly related to safety, mobility and environment aspects. The implementation of local (state level) initiatives, improve the urban development and connectivity of road network. Since 2006, The National Urban Transportation Policy (UTP) was took a major role in urban road network, which focus on safe and secure transportation. The environmental monitoring and air pollution reduction policies also been prioritized in this initiatives. The implementation of electric vehicles with zero emissions, adopting and developing practice like hot line mobility are taken place. The GOI also implemented metro transportation in urban cities which decreases the traffic congestion. This paper studies transportation policies which are used in urban transportation planning. A part from transportation planning the road or transport accessibility is also important factor in urban studies. The factors influences the accessibility are mentioned in this study. Many studies show the level of urban road network accessibility is studied using Geographical Information System (GIS) software. The GIS integrated with transportation software's like package of GIS-T software and TransCAD software are used to organize the road implementation database, new transport designing and network planning. In transportation planning GIS software is a major tool to study the route network and analysis, urban impact assessment and visualization of route map to DSS for transport planning. In this paper the proprietary tools and open source tools of GIS in transportation are explained. This paper concludes that GIS software is a main strength in transportation planning

ENHANCING HIGH-STRENGTH CONCRETE PERFORMANCE WITH TREATED HEMP FIBER REINFORCEMENT

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Abstract:

Cellulosic fiber-reinforced concrete should maintain its functional and microstructural properties over an extended period, experiencing minimal degradation and remaining free from microorganisms.In this study, we focus on treating hemp fiber to preserve its functionality for a long time. The hemp fiber is treated with 2M sodium hydroxide (NaOH) and sodium silicate (Na_2SiO_3). The research investigates six different concrete mixes, including treated and untreated hemp fiber(1%) with silica fume. Density, water absorption, compressive strength, flexural strength, and resistivity tests were performed on manufactured samples.The 28-day tensile and compressive strength of treated hemp fiber-reinforced concrete was 16.9% and 10% higher than untreated hemp fiber-reinforced concrete. Additionally, the findings demonstrate that the addition of silica fume enhances early strength gain, while hemp fiber treatment contributes to an increase in durability characteristics. Among the various mix proportions tested, the combination of 10% silica fume and 1% treated hemp fiber yields the highest concrete strength.

Key Words: Fiber reinforced concretetreated hemp fiber, Silica fume, Sustainable construction, High-performance concrete.

SOFT COMPUTING TECHNIQUES FOR CALCULATING FLEXIBLE PAVEMENT THICKNESS USING PROGRAMMING LANGUAGE FOR INDIAN ROADS.

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Abstract: One of the most important or vital objectives of modern civilization is to connect each and every corner of the world through transportation engineering. Out of which one of the important ways is roadways. This connectivity of all the corners in all the directions over globe in modern civilization is the difference one can find over old civilization. Roadways are of two types of which one is rigid pavements and the other is flexible pavement. In flexible pavements of California Bearing Ratio as well as Traffic survey of number of vehicles are known, thus from IRC(INDIAN ROADS CONGRESS) -37 code book the flexible pavement thickness can be found. The three layers of flexible pavements are viz., Granular sub base, Granular base and wearing coat widths are known and thus cumulative width of pavement thickness is also known. To develop a decision support system (DSS) for the estimation of individual and overall thickness of flexible pavement layers are automatically displayed with the help of CBR (California Bearing Ratio) value and traffic volume data.

Keywords: Flexible pavement, Decision Support System(DSS) , California Bearing Ratio (CBR), Granular sub base, Granular Base , Wearing Coat , Indian Roads Congress (IRC) etc.,

NANOTECHNOLOGY REVOLUTIONIZING INFRASTRUCTURE: HARNESSING NANOMATERIALS FOR ADVANCED CIVIL ENGINEERING

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Abstract:

The article delves into the potential applications of carbon nanotubes, SiO_2, TiO_2, Fe_2O_3, CuO, ZrO_2, ZnO_2, Al_2O_3, $CaCO_3$, Cr_2O_3, and Ag nanoparticles in civil engineering. Many studies indicate that the addition of these nanomaterials in appropriate quantities enhances the strength and durability of cementitious composites, albeit at the expense of increased setting time and reduced workability. However, challenges such as high cost and concerns about environmental and health risks associated with nanomaterials remain unresolved. Consequently, comprehensive guidelines for the practical implementation of nanomaterials in construction are eagerly anticipated. Additionally, a study evaluating the corrosion resistance of graphene and nano-TiO_2-incorporated steel-reinforced cementitious composites has been conducted. Preliminary findings suggest a lower corrosion rate in nanoadmixed composites compared to uninhibited specimens during early stages. Nonetheless, further research over extended periods is necessary to validate the effectiveness of graphene and nano-TiO_2 as corrosion inhibitors.

Keywords*:* Nanomaterials, Civil engineering, Corrosion inhibition, Cementitious composites, Environmental risks

Nanomaterials in Construction: Expanding Applications and Opportunities

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Abstract:

The emergence of nanotechnology has revolutionized the building and infrastructure industry, offering unparalleled opportunities for structural reinforcements, enhanced electronic properties, and efficient energy harvesting. However, as the industry delves deeper into the realm of nanomaterials, concerns regarding manufacturing processes, health risks for workers, and environmental impacts have intensified. This paper presents a comprehensive discussion on the applications of nanotechnology in construction, spanning various materials and characterization techniques. While significant progress has been made, the field is still in its infancy, presenting both challenges and lucrative business prospects. It emphasizes the imperative of addressing health and environmental risks associated with nanomaterials, while also advocating for responsible innovation and risk management to ensure sustainable development in this dynamic sector.

Keywords: Nanotechnology, Construction, Nanomaterials, Applications, Risks

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Message from Conference Chair

Dear Distinguished Guests, Participants and Speakers,

Welcome to the International Conference on Digital Renaissance – 2024 (DIGITAREV-2024). I hope this message finds you well and brimming with anticipation for our conference – DIGITAREV-2024. As the chair of this esteemed gathering, I am exhilarated to extend a warm welcome to each and every one of you.

Our conference promises to be a vibrant platform for exchanging ideas, fostering collaborations, and exploring the latest advancements in the field of Computer Science and Engineering. With invaluable contributions from our participants, I am confident that we will create an atmosphere ripe for learning, inspiration, and growth.

Our esteemed speakers, their expertise and insights are the cornerstone of this event. Their presentations will undoubtedly enlighten and enrich our discussions, paving the way for innovative solutions and breakthroughs. Added to this, our young, knowledgeable and bright participants' presentations and experiences will ignite thought-provoking conversations, and fuel our collective journey towards progress.

As we embark on this exciting endeavour together, let us embrace the spirit of collaboration, open-mindedness, and companionship. Let us seize this opportunity to forge new connections, expand our horizons, and leave a lasting impact on our respective fields.

We are eagerly looking to engage in all the sessions, participate in the discussions, and seize every opportunity to network with our peers. Together, let us make this conference an unforgettable experience filled with learning, growth, and inspiration.

Once again, I extend my heartfelt gratitude to each of you for your participation and support. Together, let us make this conference a resounding success!

Warm regards,

Dr. M Sharmila Kumari

Conference Chair

International Conference on Digital Renaissance – 2024

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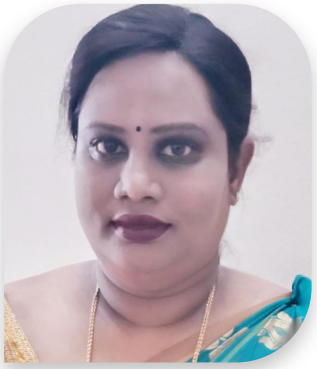

Message from Conference Co-Chair

Dear Participants,
Welcome to ICEST-24! I am delighted to extend a warm greeting on behalf of the DIGITAREV 2024. As co-chair, I am excited to witness the fusion of diverse expertise at the intersection of engineering sciences and technology. With a dedicated focus on Artificial Intelligence and Machine Learning (AIML), alongside Mechanical Engineering, Civil Engineering, Computer Science, Electronics &Communication, Biotechnology, and Basic Science, this conference offers a rich platform for exploration. Your active engagement in discussions surrounding AIML's integration into these fields will undoubtedly spark innovative solutions and drive transformative progress. Let's seize this opportunity to exchange insights and collectively pursue excellence. Thank you for your invaluable participation in ICEST-24.

Warm regards,
Dr. Manjula V.
Conference Co-Chair
DIGITAREV2024
HoD, Dept. of AIML, PACE Mangalore

PACE Conclave 2024

ICEST 2024
INTERNATIONAL CONCLAVE ON ENGINEERING SCIENCES & TECHNOLOGY

DIGITAREV 2024
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Message from Conference Convenor

Dear Participants,

Welcome to DIGITAREV 2024

I'm delighted to convene this gathering of brilliant minds, both physically and virtually, focused on advancing computer science. Together, let's chart the course for innovation, tackle challenges, and forge collaborations within the realm of DIGITAREV 2024.

I extend my heartfelt gratitude to our esteemed keynote speakers, presenters, committee members, volunteers, and sponsors for their invaluable support. Participants, let's actively engage, collaborate, and leverage our expertise to drive transformative advancements in computer science.

Embracing diversity, collaboration, and excellence, let's propel DIGITAREV 2024 to new heights of success. Thank you for your unwavering dedication and contributions.

Wishing you all a rewarding and enriching experience at DIGITAREV 2024.

Warm regards,

Dr. Shamna N. V.
Convenor
DIGITAREV 2024
Associate Professor
Dept. of Computer Science Engineering

PACE CONCLAVE: International Conclave on Engineering Sciences & Technology – 2024 (ICEST-24)

DIGITAREV 2024: International Conference on Digital Renaissance

23rd April 2024 Tuesday – Day 1	
09:30 AM to 11:30 AM	Inauguration of ICEST-24 Inaugural address by **Mr. Sohan M.** Senior Project Manager – Infosys, Mangalore Keynote Address by **Dr. P. Nagabhushan**, VC, Vignan University, AP
11:30 AM to 11:45 AM	Refreshments
11:45 AM to 01:00 PM	Keynote Address-1 on topic "Decoding Deep Learning: From Theory to Application" by **Dr. B H Shekar,** Professor, Department of Computer Science, Mangalore University, Mangalore
01:00 PM to 02:00 PM	Lunch Break
02:00 PM to 02:45 PM	Track 1 Oral presentation (Data science & Machine Learning)
02:45 PM to 03:30 PM	Track 2 Oral presentation (Cloud &Grid computing)
03:30 AM to 03:45 AM	Refreshments
03:45 PM to 04:30 PM	Track 3 Oral presentation (Blockchain Technologies)
24th April 2024 Wednesday – Day 2	
09:30 AM to 10:30 AM	Track4 Oral presentation (Network security &Cryptography)
10:30 AM to 11:30 AM	Track 5 & 6 Oral presentation(Computational Sciences, Cyber Physical Systems)
11:30 AM to 11:45 AM	Refreshments
11:45 AM to 01:00 PM	Keynote address – II on topic "Cyber Security - Trends, Challenges and Solutions" by **Dr. Nagesh H R,** Principal, Canara Engineering College, Mangalore
01:00 PM to 02:00 PM	Lunch Break
02:30 PM to 03:30 PM	• Valedictory of ICEST-24 • Valedictory address by **Dr. A. M. Khan,** Senior Professor, Dept. of Electronics & Director- Skill Development Centre Mangalore University Mangalore • Keynote Address by **Dr. Surendra Kumar**, Pro-Vice Chancellor, Presidency University, Bangalore
03:30 PM to 04:00 PM	Interaction & High Tea

MULTI LABEL SENTIMENT ANALYSIS OF COVID HANDLING OF GOVERNMENT THROUGH TWEETS

Dr. Sayed Abdulhayan[1*], Mohammed Arshad[1], Mohammed Bashith Ali[1], Muhammad Ajmal P M[1], Irfaz Ahmed[1]

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Abstract:

Emotion can be expressed in many ways that can be seen such as facial expression and gestures, speech and by written text. Emotion Detection in text documents is essentially a content – based classification problem involving concepts from the domains of Natural Language Processing as well as Machine Learning. In this paper emotion recognition based on textual data and the techniques used in emotion detection are discussed.

Key Words: Textual Emotion Detection; Emotion Word Ontology; Human-Computer Interaction.

EYE BLINK GESTURE-BASED HOME AUTOMATION CONTROL SYSTEM

Dr. Sayed Abdulhayan[1*], Shihaab Hassan[1], Mohideen Nazim[1], Mohammed Rishaan Hassan[1], Mohammed Seyyed Safwan[1]

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Abstract:

The "Eye Squint Gesture-Based Home Automation Control System" is an innovative approach to home automation that utilizes forward thinking gestures to control various household appliances and devices. The system enables users to control devices without the need for physical interaction using a camera to capture and interpret the gestures made by users. This home automation system offers numerous benefits compared to traditional methods. One of the main benefits is that it is open to all clients, especially those with adaptability debilitations or handicaps. Additionally, the system offers a more natural and intuitive way to control devices, allowing users to interact with innovation such that feels more organic and familiar. The Eye Squint Gesture-Based Home Automation Control System is also exceptionally efficient and helpful, allowing users to control various devices on the double with a single gesture. This element makes the framework much quicker and more productive than customary techniques for controlling machines and gadgets in the home. The framework is equipped for controlling different gadgets, like lights, fans, climate control systems, and home theater setups, which can be tweaked by the client's inclination. This personalization feature enables users to create a customized climate that meets their individual needs. Although the Eye Squint Gesture-Based Home Automation Control System is still being developed, it holds great promise for what's in store. As the framework turns out to be further developed and refined, it can possibly change the way people communicate with advancement in their homes, offering a more open, natural, and effective method for controlling different family gadgets.

Key Words: Eye Squint Gesture, Home Automation, Control System, Sensors, household appliances.

FLORA-VISION: A QUALITY ASSURANCE SYSTEM FOR THE PHARMACEUTICAL INDUSTRY

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Abstract:

Flora-vision introduces an advanced quality assurance system developed particularly for the pharmaceutical sector, with a primary objective of closely inspecting medicinal leaves. Modern machine learning (ML) and deep learning (DL) methods, exact camera-based detection, user-friendly UI design, are all skillfully combined in this creative solution. Under a conveyor belt, high-resolution cameras quickly and precisely identify medicinal plants from a variety of sample sets. Users can quickly identify and separate samples of interest by using the user-friendly interface. The system carefully checks a subset of samples for authenticity and freshness, and it is skilled at identifying any signs of spoiling or outside pollutants. The system ensures that such problems are quickly addressed by alerting the user through audio notification as soon as it detects any irregularities. Additionally, a real-time

Key Words: Flora-vision, Medicinal leaves, Pollutants, camera-based detection.

EMPLOYEE BURNOUT PREDICTION USING DATA SCEINCE

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Abstract:

Nowadays employees face a lot of stress due to the workload and lack of leisure time, so it is the need of hour for having to predict and analyze employee burnout. One of the most important new concerns that organizations are grappling with is employee or job burnout. Workers in the manufacturing and service sectors who are frequently exposed to demanding work environments may become more stressed out at work, burn out, or even quit their jobs. Our research identifies the main causes of burnout by gathering and analyzing data from a variety of sources, such as performance indicators, questionnaires, and HR records.

The study makes use of machine learning models and statistical methods to find patterns and correlations in the data. Our goal is to forecast employee burnout occurrences by using predictivemodels, which will allow employers to take prompt action. To understand their impact on burnout, common contributing elements are investigated, including workload, job demands, interpersonal connections, and job satisfaction.

To identify trends and correlations in the data, the study uses statistical techniques and machine learning algorithms. Our objective is to use predictive models to anticipate employee burnout so that companies can respond promptly. The effects of typical contributing factors, such as workload, job demands, interpersonal relationships, and job satisfaction, on burnout are examined.

Key Words: Machine Learning, Burnout, prediction, Linear Regression, Ridge Regression,Lasso Regressor, catboost regressor.

CLEANSIGHT: WASTE DETECTION AND SORTING

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Abstract:

The process of segregating waste prompts the generation of energy out of waste, diminishing landfills, recycling, and reduction of waste. Erroneous disposal of waste leads to recycling contamination. Contamination is a tremendous issue to the recycling industry that can be alleviated with automatic computerized waste sorting. The presence of models or strategies which help people to sort trash has become extremely important in the right discard of that garbage. Even though there are various sorts of recycling categories, many people remain confused or cannot appropriately recognize how to decide the right trash bin to dispose of every trash. Waste management and systematic sorting of them have a significant role in ecological development around the world. Society needs to lessen waste by recycling and reusing discarded materials that result in reducing environmental problems. This project aims to create an automated waste detection system using a deep learning algorithm that will gather the waste images or videos from a camera with object recognition, detection & prediction, and categorize the waste materials like cardboard, glass, metal, paper, plastic, and trash so that the waste can be properly dumped in the recyclable and non-recyclable bin.

Key Words: keywords: Waste, Classification, Object recognition

HUMAN-COMPUTER INTERACTION SYSTEM: A SURVEY OF TALKING-HEAD GENERATION

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Abstract:

The proliferation of virtual human technology has revolutionized various industries, offering unparalleled opportunities for enhanced human-computer interaction (HCI). This paper presents a comprehensive framework for human-computer interaction, focusing on the generation of talking-head videos using virtual humans. Leveraging the rapid advancements in artificial intelligence, particularly in speech recognition, text-to-speech synthesis, dialogue systems, and virtual human generation, this framework aims to elevate user experience across domains such as personal assistance, intelligent customer service, and online education. Central to this framework is the classification of models for talking-head video generation within the virtual human deep generation paradigm. Through a systematic review of technological advancements and trends spanning the past five years, this paper identifies critical works and summarizes key datasets relevant to talking-head video generation. By integrating cutting-edge techniques and methodologies, this framework strives to push the boundaries of human-computer interaction, offering innovative solutions for real-world applications.

Keywords: Human-Computer Interaction, Virtual Humans, Talking-Head Video Generation, Artificial Intelligence, Speech Recognition, Text-to-Speech Synthesis, Dialogue Systems, Deep Learning.

CYBER ATTACK DETECTION SYSTEM FOR BIOMETRIC

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Abstract:

The proposed methodology addresses the issues related to design and development of methods for eliminating the vulnerabilities/cyber-attacks that would arise when biometric based authentication is used in any of the applications such as transfer of money through biometric authentication, entry into secured places, document processing, border crossing etc. Among the several biometric traits, in the proposed work, it is planned to consider cyber-attack detection system for face biometric due to its ease of access in majority of the applications that are currently being deployed. The system will be realized as a mobile app also, so that the suitability of the proposed system will be demonstrated for low-cost devices. It is proposed to develop a simple and robust system for addressing vulnerability/cyber-attacks in face-based authentication. It is noted from the literature that the existing systems explore complex computational models where the solution can as well be given with a simple two-stage convolution neural networks. The proposed system can also be deployed on miniature devices which is where the proposed system exhibits uniqueness.

Key Words: Biometric authentication, Cyber-attacks, Computational models, Convolution Neural Networks.

ENTERPRISE BLOCKCHAIN FOR VERIFYING PRODUCT AUTHENTICITY

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Abstract:

The proposed methodology focuses on the development and implementation of a decentralized Blockchain system aimed at revolutionizing supply chain management and combating product counterfeiting. Built upon the foundational principles of Blockchain technology, the methodology ensures the immutability and transparency of data within the supply chain ecosystem. Central to this approach is the utilization of decentralized ledgers, which serve as tamper-proof repositories for critical information regarding product provenance and authenticity. Through the integration of smart contracts and cryptographic hashing algorithms, the methodology enables trustless verification mechanisms, empowering consumers to independently validate the legitimacy of products without reliance on traditional intermediaries. Manufacturers are poised to benefit from this innovative system by leveraging it to deliver genuine products while optimizing operational efficiency and reducing costs associated with quality assurance. By facilitating seamless interaction and data exchange among stakeholders, the proposed methodology fosters a more resilient and transparent supply chain infrastructure, thereby safeguarding consumer interests and preserving industry integrity against the threat of counterfeit goods.

Key Words: Blockchain technology, Decentralized system, Supply chain management, Anti-counterfeiting, Genuine products, Merchants.

DEVCOM (DEVELOPERS COMMUNITY)

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Abstract:

The College relentless quest for information coupled with the wide array of questions and challenges faced by the workforce, teachers, and students demonstrates the imperative need for an interactive web-based platform that is college-exclusive. The Malayalam word, “Dev,” comes as a new solution carefully designed to bring about smooth information sharing, collaborative learning, and effective problem-solving. By combining and going beyond text, audio, video, and AI-powered algorithms such as page rank, weighted sum, and natural language processing, Dev seeks to transcend normal boundaries in both education and communication. Dev seeks to enable the people in the collegiate ecosystem to uphold a culture of constant learning, engagement, and intellectual curiosity, guided by the necessity of the user.

Key Words: Multiple Answering System, Text, Audio, Video, Tech meetup, Natural Language Processing, PageRank Algorithm, Weighted Sum Algorithm, Information Access, Continuous Improvement.

SPEECH DENOISING BASED ON DNN USING MATLAB

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Abstract:

Denoising is the extraction of a signal from a mixture of signal and noise. Isolation is the main issue of segregating real voice from external clamour interferences, which may include non-discourse noise, speech interference or both, as well as space resonance. Traditionally, speech segregation is considered as a signal processing problem, but latest research shows discourse segregation as a superintend learning issue cantered on deep neural network (DNN), in which judicious discourse sample, orator and grumbles are deliberated from training data.

Here this work furnishes the summary of the analysis on supervised speech separation based on deep learning. Must compare two types of networks applied to the same task: fully connected and convolution. The adaptive noise cancelation strategy is robust for the clamours that are moving spatially. This research focuses on distinguishing speech from reverberation, using DNN-based deep learning. Deep Neural Network model improves speech performance and significantly improves system stability. Exploration of speech recognition uses a variety of techniques that seek to improve precision, one of which is the use of Deep Learning, but high-dimensional information problems are one of the problems that reduce the difficulty of discourse recognition.

Key Words: Non-Discourse Noise, Speech Interference, Space Resonance, Deep Neural Network.

BLADDER CANCER DETECTION USING DEEP LEARNING HYBRID MODEL

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Abstract:

Bladder cancer is a prevalent and potentially life-threatening condition with a high global incidence rate. Early detection is critical for effective treatment and improved patient outcomes. In recent years, deep learning techniques have shown promising results in medical image analysis tasks, including cancer detection. This study proposes a novel deep learning hybrid model for the early detection of bladder cancer using medical imaging data. The proposed model integrates convolutional neural networks (CNNs) and recurrent neural networks (RNNs) to effectively leverage both spatial and sequential information present in medical images, such as histopathology slides and radiological scans. The CNN component extracts relevant features from the input images, capturing spatial patterns indicative of cancerous regions. These features are then fed into the RNN component, which utilizes sequential information to further refine the detection process and enhance classification accuracy. Training and validation of the hybrid model are performed using a large dataset of annotated medical images obtained from diverse sources. Extensive experiments demonstrate the efficacy of the proposed approach in accurately detecting bladder cancer at an early stage, outperforming existing state-of-the-art methods. Furthermore, the model exhibits robustness to variations in imaging modalities and data quality, making it suitable for real-world clinical applications.

Key Words: Bladder Cancer, Convolutional Neural Networks, Recurrent Neural Networks.

STUDENT'S GRADE PREDICTION USING MACHINE LEARNING

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Abstract:

A serious menace to the community isalcoholism. Nowadays, there is a significant problem with student drinking. Poor academic performance instudents is a result of alcohol addiction. It has beensuggested that common risk factors such as unstablehomes, poor mental health, and unsupported families may make teenagers more likely to use alcohol and dopoorly in school. Excessive drinking among collegestudents is linked to several detrimental outcomes, such as teenage suicide, fatal and nonfatal injuries, violence, academic failure, sexually transmitted infections, rapeand assault, and unwanted pregnancy. A comparisonon predicting alcohol intake among collegestudents is described in the study.

Key Words: Alcoholism, grades, machine learning

H2O PRO-SMART WATER PURITY ASSURANCE AND MANAGEMENT SYSTEM FOR SMART CITY

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Abstract:

This project aims to develop an IoT-based smart water quality management system for households, facilitating efficient monitoring, billing, and maintenance. The proposed system integrates sensors to monitor Total Dissolved Solids (TDS) levels and detect impurities such as muddy water. Through Realtime data analysis, the system ensures water quality compliance, notifying administrators of any deviations from predefined standards. Additionally, it incorporates leak detection mechanisms to swiftly identify and mitigate water wastage within the household infrastructure. Furthermore, the system incorporates a billing module that accurately calculates water consumption, enabling transparent and fair billing practices. By leveraging IoT technology, users can access detailed consumption reports and billing information through a user-friendly interface, promoting water conservation and accountability. The development of this smart water management system not only enhances convenience for users but also contributes to sustainable water usage practices. Its ability to detect water quality issues, prevent wastage, and streamline billing processes offers a comprehensive solution for households seeking to optimize their water consumption and ensure the safety and cleanliness of their water supply.

Key Words: IoT Water Quality Management, TDS Monitoring, Leak Detection System, Smart Billing, Muddy Water Detection.

INTRUSION DETECTION OF IMBALANCED NETWORK TRAFFIC BASED ON MACHINE LEARNING AND DEEP LEARNING

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Abstract:

With the proliferation of network-connected devices and the increasing sophistication of cyber threats, the need for effective intrusion detection systems (IDS) has become paramount. Traditional rule-based approaches often struggle to cope with the evolving nature of cyber-attacks and the imbalanced distribution of network traffic. In this study, we propose a novel approach for intrusion detection specifically tailored to handle imbalanced network traffic using a combination of machine learning and deep learning techniques. The proposed framework leverages the strengths of both machine learning and deep learning algorithms to effectively detect intrusions in imbalanced network traffic. Initially, a preprocessing step is employed to address the class imbalance issue by applying techniques such as oversampling, under sampling, or synthetic data generation. Subsequently, a feature extraction phase extracts relevant features from the network traffic data, capturing both spatial and temporal patterns indicative of anomalous behavior. Machine learning algorithms such as random forest, support vector machines, and gradient boosting are utilized to model the extracted features and classify network traffic into normal and intrusive categories. Additionally, deep learning architectures, including convolutional neural networks (CNNs) and recurrent neural networks (RNNs), are employed to learn intricate patterns and dependencies present in the network traffic data for enhanced detection accuracy.

Key Words: Intrusion Detection Systems, Convolutional Neural Networks, Recurrent Neural Networks, Anomalous Behavior.

VISUAL QUESTION ANSWERING SYSTEM USING NLX-GPT

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Abstract:

An Artificial Intelligence system called a Visual Question Answering (VQA) System combines Computer Vision and Natural Language Processing to respond to queries asked about an image in natural language. The image is processed by the system to extract pertinent features, which are then used to decipher the contents of the image and provide a response. VQA systems have several uses, including in robotics, autonomous vehicles, and healthcare. Additionally, they are utilized in social networking, video material, and visual help in online buying. This system uses Deep Learning strategies and incorporates Firebase for sign-in and sign-up functionality, to sum up. It offers customers a quick, precise, and user-friendly way to ask questions about photographs and get precise responses in real time. As a result, the VQA model's high degree of accuracy as well as the usefulness and efficiency of the Firebase integration. Overall, this work adds to the expanding body of knowledge on VQA by highlighting the technology's potential to improve human-computer interaction and make information retrieval from visual content easier. This system gives consumers a safe and convenient experience that improves the overall usefulness by integrating Firebase for sign-in and sign-up features. This is continuing work into the development of VQA systems, with the goal of enhancing their performance and accuracy.

Key Words: Visual QA System, NLX-GPT, Flutter, Natural Language Processing.

EFFICIENT REAL-TIME TRAFFIC SIGNAL RECOGNITION FOR AUTONOMOUS CAR USING CNNS AND ARDUINO NANO

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Abstract:

Traffic signal recognition and detection systems are pivotal in modern transportation management, contributing significantly to road safety enhancement and traffic flow optimization. This research introduces a novel approach to tackle this challenge by harnessing Convolutional Neural Networks (CNNs) in conjunction with the Arduino Nano microcontroller. The proposed system aims to deliver an efficient and cost-effective solution for real-time traffic signal analysis. The system architecture comprises two main components: a CNN-based image processing module and a hardware implementation utilizing the Arduino Nano. The CNN module is tasked with detecting and recognizing traffic signals from images or live video feeds obtained from cameras installed on vehicles or traffic monitoring systems. Trained on an extensive dataset of annotated traffic signal images, the CNN module can accurately learn and identify various traffic signal patterns. This paper details the system architecture, the training process of the CNN model, and the hardware implementation on the Arduino Nano. Experimental results demonstrate the efficacy and efficiency of the system in real-world scenarios, underscoring its potential to enhance traffic management systems.

Keywords: Traffic signal recognition, Convolutional Neural Networks, Arduino Nano, Real-time analysis, Traffic management.

DEEPFAKE DETECTION SYSTEM

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Abstract:

In an era where deepfake technology threatens the credibility of multimedia content, this paper proposes a defense approach. We combine ResNext, a powerful pattern recognizer for video frames, with LSTM, a tool for understanding temporal dynamics. By merging ResNext's spatial analysis with LSTM's temporal modeling, our system effectively detects deepfake alterations that evade traditional methods. This integration of advanced AI techniques provides a promising means to combat manipulated multimedia content, preserving the integrity of digital media in an increasingly deceptive landscape. Amidst the rising threat of deepfake technology to the authenticity of multimedia content, this paper unveils a fresh defense tactic. Our strategy harnesses ResNext, known for its ability to decipher complex patterns in video frames, alongside LSTM, adept at understanding temporal changes. By blending ResNext's spatial analysis with LSTM's temporal modeling, our system proves robust in detecting deepfake alterations that often slip past conventional methods. This fusion of advanced AI techniques presents a potent avenue for countering manipulated multimedia content, thereby upholding the integrity of digital media in an era fraught with deception.

Key Words: ResNext, Long Short-Term Memory (LSTM), deepfake

OFFLINE UNIFIED PAYMENTS INTERFACE (UPI) MOBILE APPLICATION USING USSD CODE *99#

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Abstract:

This research paper delves into the development and implementation of an innovative solution for enabling offline Unified Payments Interface (UPI) transactions in areas with limited internet connectivity. Leveraging the USSD Code *99#, the paper explores the methodology behind the creation of an Offline UPI Transaction Application. Through a comprehensive analysis encompassing the workings of USSD technology, offline UPI transaction processes, security measures, and usability evaluations, this paper aims to assess the effectiveness and feasibility of the mobile application for the UPI transactions using USSD code *99# which is released by National Payments Corporation of India (NPCI). By presenting results and discussions on transaction effectiveness, user feedback, comparisons with other offline payment methods, and challenges encountered, the paper sheds light on the significance of USSD-based UPI transactions in advancing financial inclusion and digital payments accessibility.

Key Words: Offline UPI transactions, USSD Code *99#, Transaction, Digital payments, Mobile application.

VIRTUAL TRIAL ROOM USING AN AUGMENTED REALITY

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Abstract:

The ever-changing fashion industry is constantly overflowing with recent fads that a great deal of fashion enthusiasts like to evaluate on a regular premise. However, with the emergence of the Covid-19 pandemic, contacting things in broad daylight places without feeling the need of cleaning your hands has turned into a troublesome errand. Taking a stab at new clothing at stores can be truly challenging for individuals who are consistently cognizant about their well-being on such occasions. This has made individuals go online shopping however it likewise brings the issue of garments being excessively free or excessively close and clients need to return them frequently prior to tracking down the right size. This work targets this issue by presenting a virtual trial room, in which the clients can check their estimations impeccably and peruse various styles and perceive how they would thoroughly search in those garments utilizing Augmented Reality (AR) technology. AR-powered virtual trial rooms can be used in advertising and marketing campaigns, virtual trial rooms can provide enhanced customization options, enabling users to personalize and modify products to their liking The cutting-edge Augmented Reality Try-On system for clothing, leveraging the powerful combination of AR Foundation and Unity 3D. This work incorporates the advanced capabilities of AR Kit to track the user's body in real time, utilizing the rear camera of the device.

Keywords: Augmented Reality, Virtual fitting room, Online Shopping.

DETECTION OF PARKINSON'S DISEASE, ML APPROACH

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Abstract:

One of the most common diseases affecting the global public health, Parkinson's disease (PD) is getting worse every day and has already affected several nations. As a result, it is crucial to forecast it at a young age, a task that has proven difficult for experts because disease symptoms typically appear in middle-aged or older people. The model in this study is developed utilizing a variety of machine learning approaches, including adaptive boosting, bagging, neural networks, support vector machines, decision trees, random forests, and linear regression. It focuses on the speech articulation difficulties symptoms of PD affected persons. Various criteria, including accuracy, the receiver operating characteristic curve (ROC), sensitivity, precision, and specificity, are used to assess how well these classifiers perform.

Keywords: Parkinson's disease, Disease Detection, Random Forest.

BLOCKCHAIN BASED SUPPLYCHAIN MANAGEMENT

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Abstract:

Supply chain management (SCM) is a critical aspect of modern business operations, encompassing the flow of goods, information, and finances from raw material suppliers to end customers. Traditional SCM systems often suffer from inefficiencies, lack of transparency, and susceptibility to fraud and errors due to centralized control and manual record-keeping. To address these challenges, this paper proposes a novel approach utilizing blockchain technology to revolutionize supply chain management processes. Blockchain, a decentralized and immutable ledger technology, offers a transparent, secure, and tamper-proof platform for recording and verifying transactions across a distributed network of nodes. By leveraging blockchain in supply chain management, this research aims to enhance trust, transparency, and efficiency throughout the supply chain ecosystem. Key features of the proposed blockchain-based SCM system include transparency, traceability, security, smart contracts, and efficiency. Transparency ensures all participants have real-time visibility into the movement of goods, while traceability enables seamless tracking of product journeys. Security is maintained through the decentralized nature of blockchain, reducing the risk of counterfeit products and fraud. Smart contracts automate agreements between parties, streamlining processes such as payments and compliance enforcement. Efficiency is achieved by eliminating intermediaries and manual paperwork, reducing delays and costs. To validate the effectiveness of the proposed system, a proof-of-concept implementation will be developed and tested in a real-world supply chain scenario. The research will evaluate the system's performance in terms of cost reduction, process efficiency, and overall supply chain visibility. In conclusion, the adoption of blockchain technology in supply chain management holds the potential to revolutionize traditional practices, offering a secure, transparent, and efficient solution to address the complexities and challenges of modern supply chains. This paper contributes to the growing body of research in blockchain applications and demonstrates its practical implications in improving supply chain operations.

Key Words: Blockchain, Smart Contract, Decentralization, Distributed Network.

BLOCKCHAIN BASED MUSIC PLAYER

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Abstract:

We offer an innovative strategy for enhancing the music industry using blockchain technology. Here, we create tokens and cryptocurrency wallets that facilitate transactions between artists and fans using the Ethereum/Solana blockchain network. In this project, we use smart contracts to eliminate the man-in-the-middle problem and boost transparency. This allows for transparent, instantaneous, and direct exchanges between musicians and artists. Because the artists can set their own NFTS, the system functions in a more regal manner. This strategy will address the problems of unpaid invoices and granting artists their share of the rights.

Key Words: Ethereum/Solana, Crypto-Currency, Crypto-Wallets, Man- in-the middle, Smart Contracts, NFT

PERFORMANCE OF AGC FOR HYBRID POWER SYSTEM TUNNED WITH DIFFERENT TUNER USING FUZZY LOGIC CONTROLLER

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Abstract:

In this paper, load frequency control loop and Automatic voltage controller loop are studied to control the frequency for single area and two area hybrid power system. The present trend is to explore different sources of energy sources which may be integrated with the grid. In this work thermal, hydro, nuclear and diesel power sources have been integrated with the grid. The different fine tuners, considered to obtained better results, are PDF, PI, PIDF, and gain of these different controllers are enhance using MATLAB tuner. A fuzzy logic controller is used to sharpen the area control error. The simulation results obtained from series connected PIDF are found to be better than other controllers in respect of settling time, rise time, peak value, and peak time. MATLAB 2016 has been used throughout the study.

Keywords: Independent System Operator, Load Frequency Control, Power System Operator.

A STUDY ON THE INFLUENCE OF PRODUCTIVITY OF EMPLOYEE BASED ON EMOTIONAL INTELLIGENCE IN SERVICE SECTOR

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Abstract:

It is significant for service industry workers to have elevated levels of morale and emotional intelligence. Researchers employed an analytical approach to gauge participants' levels of accomplishment depending on their emotional intelligence. This research analyzes the influence of Emotional Intelligence (EI) on worker accomplishment in the service industry to deduce the implication of this structure in organizational studies. Questionnaires are used to gather information from workers in the service industry. There are six Emotional Intelligence (EI) elements that have a key role in the performance of employees, according to the report. To be productive, assessing once own abilities is pivotal to monitoring your own progress; act and inspired; empathize with others; and preserve your integrity. The researchers determined that raising workers' levels of emotional intelligence would have a positive impact on their output and efficiency.

Keywords: Emotional intelligence, Employee's Performance, Service sector.

NEUROCARE: A WEARABLE GADGET FOR HEADACHE RELIEF

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Abstract:

This project presents the development of a novel gadget aimed at alleviating various types of headaches, particularly migraines, through a combination of acupressure techniques and innovative hardware and software integration. The gadget, resembling a helmet, employs vibrating chips strategically placed to target specific pain areas identified by the user through a mobile application. The application not only facilitates personalized therapy but also records therapy duration and user data for disease prediction and holistic health recommendations. Additionally, the helmet's resizable feature ensures a comfortable fit for users of varying head sizes, enhancing usability and effectiveness. This expansion highlights the adjustable nature of the helmet, addressing user comfort and adaptability, which are crucial factors in ensuring the success and widespread adoption of the device.

Key Words: Headache relief, Migraine management, Acupressure therapy, Wearable device.

ECOTECH: AN AUTOMATED WASTE SEGREGATION SYSTEM

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Abstract:

This project aims to create an automated waste detection system using a deep learning algorithm that will gather the waste images from a camera with object recognition, detection & prediction, and categorize the waste materials like cardboard, paper and plastic bottles so that the waste can be properly dumped in the recyclable and non-recyclable bin. The presence of models or strategies which help people to sort trash has become extremely important in the right discard of that garbage. Even though there are various sorts of recycling categories, many people remain confused or cannot appropriately recognize how to decide the right trash bin to dispose of every trash. Waste management and systematic sorting of them are a significant role in ecological development around the world.

Keywords: Waste segregation, deep learning, CNN, Object recognition.

CYBERBULLYING MITIGATION IN SOCIAL NETWORKS

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Abstract:

Detecting Cyberbullying is essential owing to its harmful impact on mental health, potentially causing depression and low self-esteem, necessitating the advancement of automated tools for intervention. The project focusses on hate speech detection in social media ,employing a hybrid approach of natural language processing and ensemble machine learning .Data undergoes pre-processing steps like stemming ,token splitting, character removal, and infection elimination .Various classifier , such as support vector machine, decision tree , random forest ,relevance vector machine and Naïve Bayes are utilized .The objective is to create a language independent model capable of classifying code mixed post into hate speech, offensive language ,or non-hate speech. The ensemble technique enhances cyberbullying detection. The fine-tuned resulted with the highest F measure of 72.42 %. Our study determined that transfer learning embedded as the optional approach for achieving enhanced performance with reduced effort, due to elimination of feature engineering and resampling requirements.

Key Words: Cyberbullying Detection, Distil Bert, machine learning, pre-trained language models (PLMs), Transfer learning, Toxicity Features, AmiCa Dataset, LIWC, empath.

MEDIBOT: REVOLUTIONIZING HEALTHCARE WITH AN INTELLIGENT ONLINE MEDICINE ORDERING ASSISTANT

Shankara Gowda S R[1*], Adarsh N Patel[1], Bharath Raj V[1], Anupama S[1], Bharath V[1]

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Abstract:

The integration of AI (Artificial Intelligence) in healthcare has witnessed significant advancements, contributing to improved patient experiences. This study introduces an AI chatbot designed specifically for medicine ordering, aimed at enhancing accessibility, efficiency, and user satisfaction in the healthcare sector. The chatbot uses Natural Language Processing (NLP) to understand and respond to user needs related to medicine orders. By using a traditional relational database of pharmaceutical information, the chatbot provides accurate details on various available medicines. The chatbot offers a user friendly interface accessible via various platforms such as web applications, making it convenient for users to interact and place medicine orders. Users can efficiently place medicine orders through the chatbot interface, which facilitates a efficient ordering process. Additionally, the chatbot provides real time order tracking, keeping users informed about the status and tracking orders. By introducing an AI Chatbot for medicine ordering, this research aims to revolutionize the healthcare industry's approach to medication management. This research work represents the Chat flow, components of a chatbot, Implementation using Dialog flow.

Keywords: Chatbot, Artificial Intelligence, Dialog flow, Advantages.

MULTI-LINGUAL AI CHATBOT FOR WEB OPTIMIZATION

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Abstract:

In an increasingly digital world, the ability to efficiently navigate websites and access information is a fundamental aspect of user experience. This project presents the development of an AI-based chatbot designed to enhance website navigation by offering both audio and text interactions. The chatbot leverages advanced natural language processing and machine learning models to understand user intent, assist with searches, and guide users to relevant content or services. Its multimodal capabilities cater to user preferences, allowing them to communicate via voice or text, while personalization features enhance user engagement. Seamless integration with websites and scalable performance ensures a versatile and user-centric solution. As data is gathered and user feedback is collected, continuous improvements are made, making the chatbot an invaluable tool for enhancing the online user experience.

Key Words: Navigation, Chatbot, natural language processing, Website Integration

ATTENDANCE SYSTEM USING FACE RECOGNITION

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Abstract:

This paper presents a comprehensive analysis of the integration of Facial Recognition Attendance systems in educational institutions and organizations, with a focus on optimizing attendance tracking processes. The study emphasizes the transition from traditional paperwork-based methods to a more efficient and accurate digital system. To achieve seamless integration without disruptions, the paper recommends utilizing accessible programming tools like JavaScript and Django to develop a user-friendly facial recognition system. This system can capture images from various distances and store attendance data in an Excel sheet with timestamps for easy verification thereby ensuring accuracy and reliability. Ethical considerations and concerns regarding privacy, consent and data security are thoroughly discussed, keeping in mind the need for transparent policies, user permissions and robust security measures to safeguard sensitive information and prevent unauthorized access or misuse. The paper aims for a balanced approach that combines technological innovation with ethical awareness to ensure efficiency while respecting individual rights in educational environments, other organizations and beyond. Moreover, the paper delves into potential societal impacts and the importance of human oversight for accountability and fairness. By addressing these aspects, the paper aims to contribute to the responsible adoption of Facial Recognition Attendance systems.

Key Words: facial recognition, Attendance systems, Ethical considerations.

PREDICTING STAGES OF DIABETIC RETINOPATHY

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Abstract:

Diabetic Retinopathy presents a common challenge among individuals with diabetes, often resulting in irreversible vision loss if not detected early. Traditional diagnosis methods offer no cure once vision is compromised, underscoring the critical importance of early detection and treatment. To preserve patients' vision, ophthalmologists rely on fundus images, capturing the retinal details of patients' eyes. However, manual detection of abnormalities by human observers is time-consuming, costly, and prone to error due to individual variances among ophthalmologists.

To address these challenges, Deep Learning Technology holds promise in detecting diabetic retinopathy from fundus images. By leveraging computer-based diagnosis systems, the risk of misdiagnosis is reduced. Deep learning methods, particularly Convolutional Neural Networks (CNNs), are widely employed for accurate image recognition and feature detection, with ocular images serving as training data to achieve high diagnostic accuracies.

Key Words: Diabetes, Ophthalmologists, Convolutional Neural Networks, Fundus.

EMOTION RECOGNITION OF ELDERLY PEOPLE USING DEEP LEARNING

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Abstract:

Currently, many countries around the world are moving towards becoming an aging society. The mental health of the elderly is one of the key challenges in an aging society. An elderly population is a special group that needs to be taken care of closely. A key area of concern for the elderly is that of mental health and many technologies can be applied in this area. One possible tool is facial expression recognition (FER) that can be used to detect emotions of the elderly for the purpose of mental health care. Emotion recognition in the field of human computer interaction refers to that the computer has the corresponding perceptual ability to predict the emotional state of human beings in advance by observing human expressions, behaviors, and emotions, so as to ensure that computers can communicate emotionally with humans. This project proposes a reminder system to help patients or old people to take medication. It also helps the users to take appointments from the needy doctor and send notification about the appointment confirmation and notify the caretaker about the appointment date and time well in advance. This project recognizes the emotions of elderly people using deep learning techniques and sends the notification to caretaker so that care taker can respond to elder people very quickly. This project uses Django framework to build backend of the system and uses MySQL for persistent data storage. Android application enables a graphical user interface where end user will interact with application.

Key Words: Mental health, facial expression recognition, emotions, human expressions, detect emotions.

STOCK MARKET PREDICTION USING MACHINE LEARNING

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Abstract:

Predicting stock price movements remains challenging due to the dynamic and complex nature of financial markets. Traditional methods like technical analysis have limitations in capturing intricate patterns and adapting to changing market conditions. There is a need for innovative approaches that combine the insights of technical indicators with the learning capabilities of machine learning models. This proposed method aims to address these challenges by proposing a hybrid methodology for more accurate and adaptable stock market predictions. Within the area of stock market prediction, forecasting price values or movements is one of the most challenging issues. Because of this, the use of machine learning techniques in combination with technical analysis indicators is receiving more and more attention. To tackle this problem, in this work we propose a hybrid approach to generate trading signals. To do so, our proposal consists of applying a technical indicator combined with a machine learning approach to produce a trading decision. The novelty of this approach lies in the simplicity and effectiveness of the hybrid rules as well as its possible extension to other technical indicators. To select the most suitable machine learning technique, we compared the performances of Linear Model (LM), Artificial Neural Network (ANN), Random Forests (RF) and Support Vector Regression (SVR). As technical strategies for trading, the Triple Exponential Moving Average (TEMA) and Moving Average Convergence/Divergence (MACD) were considered. We tested the resulting technique on daily trading data from three major indices: Ibex35 (IBEX), DAX and Dow Jones Industrial (DJI). The Results achieved show that the addition of machine learning techniques to technical analysis strategies improves the trading signals and the competitiveness of the proposed trading rules.

Key words: Artificial Neural Network, Support Vector Regression, machine learning.

LIP READING: TRANSFORMING SPEECH INTO TEXT

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Abstract:

Lip reading, also known as speech reading, is a unique form of communication that involves understanding spoken language by visually observing the movements and expressions of a speaker's lips and face. This abstract provides an overview of lip reading, its importance, challenges, and applications in diverse fields. Lip reading is a valuable skill that serves as an alternative or complement to auditory perception, particularly for individuals with hearing impairments. It enables them to decipher spoken language by interpreting the visual cues provided by lip, tongue, and facial movements. Moreover, lip reading can be employed in situations where audio input is limited, such as noisy environments or when maintaining silence is essential. The practice of lip reading relies on the ability to recognize specific phonetic and linguistic features in lip and facial gestures. It demands a high degree of visual acuity, context awareness, and expertise, as the accuracy of interpretation can be influenced by factors like speaker variations, obscured or rapid lip movements, and limited visual cues. The applications of lip reading extend beyond accessibility for the hearing-impaired. It has potential in fields like human-computer interaction, surveillance, and security, where the ability to understand spoken language without audio input is advantageous. Integrating lip reading into automated systems and artificial intelligence holds promise for enhancing communication and improving the accessibility of information. These abstract underscores the significance of lip reading as a means of communication and highlights its potential in various domains. It emphasizes the need for ongoing research and development to improve the accuracy and practicality of lip-reading techniques, ultimately contributing to more inclusive and accessible communication solutions for diverse populations and applications.

Key Words: Lip reading, accessible communication, human-computer interaction.

COMPARATIVE ANALYSIS OF LIGHTWEIGHT AND HEAVYWEIGHT CRYPTOGRAPHIC TECHNIQUE

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Abstract:

This paper is about comparative studies of cryptographic algorithms traditional heavyweight and lightweight cryptographic algorithm. While transferring data security has to be maintained, security can be obtained by using different cryptographic algorithm. Asymmetric public key encryption algorithm RSA and lightweight public key encryption algorithm ECC (Elliptic Curve Cryptography) are analyzed here. Analysis is performed based on the key length and time complexity.

Key Words: Cryptography, Lightweight, heavyweight, RSA, ECC, time complexity.

AN ENHANCED LIGHTWEIGHT SECURE CRYPTOGRAPHIC ENCRYPTION AND DECRYPTION ALGORITHM USING NEW MERSENNE NUMBER TRANSFORM FOR IOT APPLICATIONS

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Abstract:

The main challenge in designing a security solution for IoT applications is due to its edge layer devices. They are very resource constrained. To build the security mechanism in the devices such as sensors, actuators, and Radio Frequency Identification devices (RFID) the requirement of lightweight cryptographic techniques is the obvious solution. Before becoming IoT so popular many lightweight cryptographic algorithms had been introduced. During that periods Lightweight cryptography was not much popular. But with the increasing development of IoT in this era lightweight cryptography is more important. Today's available lightweight cryptographic algorithms do not provide more security. The main aim of the already existing lightweight algorithm is to reduce the resource requirements of the algorithm in terms of its computational cost, memory requirements etc. Security becomes the secondary thing. But with the arrival of more IoT applications to make it more secure the proper balance between security and requirements should be maintained. The conflict between resource requirements and security should be reduced. The main aim of this paper is to design a secure Lightweight encryption algorithm suitable for IoT application. This proposed Lightweight Encryption and decryption algorithm uses New Mersenne Number Transform, which provides good diffusion property and employs a fast algorithm to compute the transform. Further, the hash function's New Mersenne Number Transform supports the powerful property of variable transform length (powers of two). These properties make New Mersenne Number Transform suitable for the design of new Lightweight hashing technique.

Key Words: IoT, Lightweight Cryptographic Technique, New Mersenne Number Transform

AI TRANSFORMING HEALTHCARE: A COMPREHENSIVE LOOK AT BIOMEDICAL APPLICATIONS

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Abstract:

Artificial intelligence (AI), encompassing machine learning and deep learning, is revolutionizing the analysis of large-scale biomedical datasets. These technologies play pivotal roles in disease diagnosis, prognosis, and treatment by effectively handling diverse data types such as medical images, genomic data, electronic health records, and clinical notes. Leveraging AI algorithms, medical imaging has witnessed enhanced precision and efficacy in disease detection, enabling early diagnoses of conditions like cancer, Alzheimer's, and cardiovascular disorders. Moreover, AI-driven image analysis facilitates personalized treatment plans and streamlines radiology workflows. In biomedical research, AI emerges as a transformative tool with immense potential across various sectors. This study provides an overview of AI's applications in biology, underscoring its diverse and impactful contributions.

Keywords: Keywords: Artificial intelligence (AI), Biomedical data analysis, Disease diagnosis, medical imaging, Personalized treatment

CI-AI FRAMEWORK: ENHANCING CHATBOT TRAINING AND EVALUATION FOR IMPROVED PERFORMANCE

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Abstract:

In this work we present the Chatbot Interaction with Artificial Intelligence (CI-AI) framework as an approach to the training of deep learning chatbots for task classification. The intelligent system augments human-sourced data via artificial paraphrasing to generate a large set of training data for further classical attention and language transformation-based learning approaches for Natural Language Processing. Human beings are asked to paraphrase commands and questions for task identification for further execution of a machine. The commands and questions are split into training and validation sets. We describe and validate a metric for estimating multi-class classifier performance based on cross-validation and adapted for improvement of small unbalanced natural-language datasets used in chatbot design. Our experiences draw upon building recruitment chatbots that mediate communication between jobseekers and recruiters by exposing the ML/NLP dataset to the recruiting team. Evaluation approaches must be understandable to various stakeholders and useful for improving chatbot performance.

Key Words: Chatbot Interaction with Artificial Intelligence, task classification, artificial paraphrasing, Natural Language Processing, multi-class classifier, recruitment chatbots, cross-validation.

IOT CLOUD FOR HYDROPONICS SYSTEM AND DATA MONITORING FOR AGRICULTURE

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Abstract:

Hydroponics systems are becoming increasingly popular in agriculture as they offer several advantages over traditional farming methods, such as the ability to conserve water and produce Higher yields. However, monitoring and controlling the various environmental parameters in hydroponics system can be challenging. In this project we propose a solution that leverages IOT technology to collect and analyse data from hydroponics system, including temperature, humidity, pH, light, and nutrient levels. The data is then transmitted to a cloud-based platform for analyses and visualisation, allowing farmers to make informed decisions about their crops. In addition to real-time monitoring, an IOT-enabled hydroponic system can also provide historical data on environmental conditions, enabling growers to identify trends and make informed decisions about future adjustments to the system. This system is designed to be scalable, flexible, and easy to use, allowing farmers to customize it to meet their specific needs. With the use of IOT technology, the system can also provide real-time monitoring and alerts, reducing the risk of crop failure and increasing productivity.

Key Words: Hydroponics, cloud-based platform, IOT technology.

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Message from Conference Chair

As the Conference Chair of the Semi-Comm Tech Summit, hosted by the Department of Electronics and Communication Engineering, it is my honor to extend a warm welcome to all attendees.

The convergence of technology and communication has become the cornerstone of modern society, reshaping industries, economies, and daily interactions. In this transformative landscape, our conference serves as a beacon, illuminating the latest advancements, fostering collaboration, and shaping the future trajectory of semi-communication technologies.

Throughout our event, esteemed speakers and participants from diverse backgrounds will converge to explore emerging trends, share insights, and cultivate innovative solutions. From keynote presentations to interactive workshops, each session promises to ignite inspiration and drive meaningful dialogue.

Your presence at this summit is not just a testament to your commitment to the field but also a catalyst for the exchange of knowledge and ideas that will propel us forward.

Together, let us seize this opportunity to forge new partnerships, challenge existing paradigms, and pave the way for a future where communication technologies enrich lives and empower communities.

Thank you for your participation, & I eagerly anticipate the engaging discussions & collaborations that will unfold at the Semi-Comm Tech Summit.

Warm regards,

Dr. Asif Hassan

Chair- SEMI-COMM TECH SUMMIT

Department of ECE, PACE, Mangalore

Message from Conference Convenor

It is with great pleasure and gratitude that I extend my warmest welcome to each and every one of you to the Semi-Comm Tech Summit conference.

Our world is undergoing rapid transformation, driven by advancements in communication technologies. These advancements have revolutionized how we interact, collaborate, and innovate. The Semi-Comm Tech Summit serves as a platform to explore the latest trends, exchange insights, and foster collaborations that will shape the future of communication technologies. Throughout this conference, you will have the opportunity to engage with thought leaders, industry experts, & visionaries who are at the forefront of driving change in semi-communication. Through keynote speeches, panel discussions, and interactive sessions, we aim to ignite discussions, spark creativity, and chart a course towards a more connected and inclusive future. Thank you for being part of this momentous occasion. I wish you all an enriching and inspiring experience at the Semi-Comm Tech Summit conference.

I am confident that the discussions and insights shared at this conference will inspire collaboration, spark innovation, and pave the way for a future where electronics & communication technologies empower us to create a more connected, intelligent, and sustainable world.

Thank you for being part of this momentous occasion. I wish you all an enriching and inspiring experience at the Semi-Comm Tech Summit conference.

Warm regards,

Warm regards,

Dr. Asia Hazareena

Convenor

SEMI-COMM TECH SUMMIT

Associate Professor

Department of ECE, PACE, Mangalore

International Conclave on Engineering Science & Technology (ICEST 24)

SEMI-COMM TECH SUMMIT: "INTERNATIONAL CONFERENCE ON EMERGING TRENDS IN ELECTRONICS AND COMMUNICATION"

23rd April 2024 Tuesday – Day 1	
09:30 AM to 11:30 AM	Inauguration of ICEST-24 Inaugural address by **Mr. Sohan M.** Senior Project Manager – Infosys, Mangalore Keynote Address by **Dr. P. Nagabhushan**, VC, Vignan University, AP
11:30 AM to 11:45 AM	Refreshments
11:45 AM to 01:00 PM	Keynote Address-1 on topic "Performance of an air breathing PEM fuel cell used in fuel cell vehicles from in-situ measurements of operational parameters" by **Dr. A. R. Vijay Babu**, Associate Professor Dept. of ECE, Vignan University.
01:00 PM to 02:00 PM	Lunch Break
02:00 PM to 02:45 PM	Track 1 Oral presentation (Communication networks and Security)
02:45 PM to 03:30 PM	Track 2 Oral presentation (Embedded System)
03:30 AM to 03:45 AM	Refreshments
03:45 PM to 04:30 PM	Track 3 Oral presentation (Signal Processing)
24th April 2024 Wednesday – Day 2	
09:30 AM to 10:30 AM	Track 4 Oral presentation (Electromagnetics and Antenna Design)
10:30 AM to 11:30 AM	Track 5 & 6 Oral presentation (VLSI and MEMS & Power and Energy Systems)
11:30 AM to 11:45 AM	Refreshments
11:45 AM to 01:00 PM	Keynote address – II on topic "Transformative power of Exponential and Emerging Technologies" by **Dr. B. Aziz Musthafa**, Professor, Department of Computer Science. Bearys Institute of Technology, Mangalore**.**
01:00 PM to 02:00 PM	Lunch Break
02:30 PM to 03:30 PM	• Valedictory of ICEST-24 • Valedictory address by **Dr. A. M. Khan,** Senior Professor, Dept. of Electronics & Director- Skill Development Centre Mangalore University Mangalore • Keynote Address by **Dr. Surendra Kumar**, Pro-Vice Chancellor, Presidency University, Bangalore
03:30 PM to 04:00 PM	Interaction & High Tea

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TO DEVELOP A NEARLY ZERO ENERGY BUILDING USING BIM AND AR

Fathimath Hanna[1], Mahamad Asif S[1], Abdul Shaheed Kaiseeran[1], Aboobacker Muzammil[1], Praveen Suvarna[1*]

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ABSTRACT:

A Net Zero-Energy Building (NZEB) is a building with net zero energy consumption, meaning the total amount of energy used by the building on an annual basis is equal to the amount of renewable energy created on the site.There are only a limited number of buildings that use the concept of NZEB at present. The construction of NZEBs is becoming more and more feasible owing to advancements in building technology, renewable energy systems and academic research.The current project aims to conceptualise a residential building that uses the concept of NZEB. With the combination of BIM and AR technology, the concept of NZEB can be achieved in a maximum reasonable way.As we visualise the building, the energy optimisation of the building can be done in a better manner in the present and future than in the past due to the advancement in the technology like Building Information Modelling (BIM) and Augmented Reality (AR).Together BIM and AR can be used as tools to help in designing, constructing and operating the NZEB. By providing detailed visualisation, energy analysis and real-time data, BIM and AR helps in optimising the building performance and achieving the NZEB goals.

Key Words: Building Information Modelling, Augmented Reality. Net Zero Energy Building

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DESIGN AND SIMULATION OF PHASED ARRAY ANTENNA FOR 5G APPLICATION

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Abstract:

Modern mobile communication faces challenges due to limited frequency spectrum, driving the need for antennas that are simple, low-profile, and robust. Microstrip patch antennas and arrays are ideal choices due to their size, cost, and performance advantages. Polarization is crucial, especially in mobile and space communications where antenna misalignment requires constant reorientation. Rectangular microstrip patch antennas can help mitigate signal loss and multipath effects in such scenarios. Phased array subsystems are becoming essential in next-generation mobile communication for their ability to electronically steer antenna beams without physical movement. Previous methods for rectangular microstrip patch radiation using orthogonal modes with 90° time-phase difference resulted in poor axial ratio, gain, and return loss. These methods also used complex dual-feed excitation with an external 90° power divider and external phase shifters for beam steering. This thesis proposes a simpler approach using a corner trimming technique for radiation and progressive phase excitations at source ports for phased arrays. Design and optimization for 26 GHz operation are achieved using simulation-based modeling software, ANSYS HFSS, on substrates like FR4 epoxy and Rogers RT duroid 5880. The work includes the design and simulation of rectangular microstrip patches, as well as 1x2 and 1x4 linear phased arrays, to operate at 26 GHz.

Keywords: Antenna, Phased array antenna, rectangular patch antenna, Beamsteering, Mutual Coupling, 5G.

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Comparative Study of 32 –bit ALU in Different software tools

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ABSTRACT

The paper presents comparative study of design and Synthesis of 32- BIT Arithmetic Logic Unit (ALU) using different software tools. The different software tools like using VHDL Xilinx Synthesis tool ISE 9.1i and targeted for Spartan device. The Virtual Input/output (VIO) debug feature can both monitor and drive internal FPGA signals in real time. This feature is used when there is no possibility to access on physical input and output devices on the target hardware. and the next software tool is Vivado. The Vivado HLS is based on the transformation of high-level C language into a register transfer level implementation. This can be later interfaced using Xilinx FPGA.

Keywords— FPGA (Field Programmable Gate Array), HDL (Hardware Description Language), RTL (Register Transfer Level) design VIO (Virtual Input Output).

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WIRELESS BATTERY CHARGING DEVICE FOR ELECTRICAL VEHICLES

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ABSTRACT:

In response to the pressing need to reduce environmental degradation and reliance on fossil fuels, there has been a considerable increase in the adoption of electric cars (EVs) as a replacement for traditional combustion engine vehicles. This shift toward Evs is motivated by a shared desire to reduce the strain on our planet's ecology while also addressing concerns about air pollution and climate change. As the EV market expands, one of the primary challenges that consumers face is providing simple and effective charging options. Recognizing this issue, various charging methods are being explored and implemented to respond to the various requirements of EV users. However, an important barrier in increasing the use of Evs remains the establishment of a strong charging infrastructure that can support the growing demand. In this project, wireless charging systems (WCS) became known as a promising approach to improve EV charging ease of use. WCS provides a seamless charging experience using in order linked power transfer technology, eliminating the need for physical connections. This not only makes it easier for EV owners to charge their vehicles, but it also helps to keep the city surroundings clean. In addition, the move to plug-in electric vehicles (PEVs) is becoming more popular, especially in developed countries, due to a number of issues including rising fuel prices, running out of resources, and environmental concern. Consumers and government agencies are putting more and more pressure on manufacturers to use greener, more sustainable technology like plug-in hybrid electric vehicles (PEVs). However, in addition to environmental concerns, the wide use of PEVs also depends on profitability and technological improvements. Adoption rates are significantly influenced by consumer confidence in PEVs' dependability and performance, particularly with regard to their driving range and infrastructure for charging. A lot of work is being done to improve the efficiency and dependability of electric car charging stations, especially fast-charging stations inside the distribution system, in order to address these issues.

Key Words: Automobile, Electric vehicles, Magnetic coil, Wireless charging.

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IOT BASED AGRICULTURE PESTICIDE SPRAYING ROBOT

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Abstract:

India is an important agricultural country with three percent of its population engaged in agriculture. As the climate and other resources become available to them, farmers will grow more crops in their fields. However, in order to produce well and effectively, some skills and support are needed. Diseases in plants are considered changes or defects in the normal function of the plant that cause certain symptoms. Phytopathogens are generally defined as bacteria of any species.

Most of the disease symptoms appear on the leaves, stems and branches of plants. Therefore, detection of diseases and infections in crops is important for good and successful farming. This can be done by taking pictures of ideas with a camera and analyzing them using machine learning techniques. This indicates disease on leaves, stems or plants. It also indicates that the area is infected and estimates the pesticide effect caused by the specific pesticide sprayed on the infected area.

This is important for effective pesticide use. This will benefit the farmers as it can be controlled from anywhere without the need to work in the field and without access to pesticides. It is not affected by health.

Key Words: Phytopathogens, Machine Learning, Pesticide spraying, Disease diagnosis, Agriculture robot.

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SMART MEDICATION DISPENSER

Nidhi G Shetty[1], Fathimath Nusaiba[1], Khadeejathul Thasfiya Banu[1], LittiMol Mathew[1*]

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Abstract:

We all know at least one person who must take medication in the form of pills or tablets in order to live a healthy life in this day and age of modern medicine, when humans are mostly dependent on the use of pills or tablets. In this project, we're primarily concerned with ensuring that your loved ones, who may be elderly, experiencing memory loss, or struggling to remember their medication schedule, take their pills on time, all over the world, with the help of a smart medication dispenser that works on a schedule. This project involves designing and building the final product's body as well as its component pieces. We always want the people we care about to be fit and healthy. And what would happen if they fall unwell and neglect to take their medication on schedule? Surely we would be concerned? Reminding every patient to take their medication on time can be challenging in hospitals due to the large number of patients. In the past, people had to actively remind themselves to take their medications on schedule. it is not the case in the digital age, and we can accomplish it using machines. Smart Medicine Reminder has a very broad range of applications that physicians can utilize in hospitals, at home, and in many other settings. There are numerous approaches to reminding When it comes to prompting, there are numerous approaches to do so Put it on show, notify via phone or email, making use of mobile applications, The buzzer sounds, Using Wi-Fi and Bluetooth, receive a call, Remember the current time and the medication time for the following day.

Key Words: Medication Schedule, Reminder Methods, Digital Age, Healthcare, Smart Medication Dispenser

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MACHINE CONTROL USING POLY KINESICS CONTROLLER

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Abstract:

This paper is aimed at designing a custom Microcontroller like device called Poly-Kinesics controller to easily handle and modify various body signals like EMG, ECG, EOG, EEG, etc. It can be programmed by the user in languages like C or Micro Python and does not require learning a completely new language. The controller hardware can be modified within the program, making it flexible for various applications. It will be used to control another machine like a robotic/mechanical arm using only skeletal muscles in a human arm. Movements of the arm muscles are detected and acquired, and the robotics arm can be controlled as per the user's program. The signals are first acquired, filtered and amplified before using it for other applications.

Key Words: Poly-Kinesics Controller, Micro Python

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Solar Based Wireless EV Charging Stations

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Abstract:

To achieve a pollution-free environment, electronic vehicles will soon replace conventional vehicles. Many scholars are now interested in studying electrified automobiles. Recently developed technology called Wireless Power Transfer (WPT) offers interesting applications. WPT is the technology that transmits electrical power with no direct connection utilizing magnetic resonance. The WPT uses the same fundamental principle as the conventional transformer, which is based on inductive power transfer. WPT can be applied on the electric vehicle (EV) for both charging system: stationary and dynamic chargers. This global system can integrate the photovoltaic systems in the charging stations which are built for the electric vehicles and the supervision base. A wireless network has been put up for the communication. In order to validate the theoretical calculations, an 8kW prototype for charging a 120 V battery was suggested. The overall system efficiency is~93%.The system can eliminate the load's impacts to provide a stable functioning. The simulations are to verify the theoretical analysis of the suggested WPT's effectiveness.

Keywords: Photovoltaic energy, stationary charging, wireless power transmission, inductive power transfer, electric vehicles (EVs), and DC-DC converters.

GYROSCOPE CONTROLLED WHEEL CHAIR FOR DISABLED PATIENTS

Mahammed Fozail P.[1], Ibrahim Inzaman[1], Joswin Crasta[1], Mohammed Zakir Bellary[1*]

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Abstract:

Utilizing useful, cutting-edge and reasonably priced equipment should improve the quality of life for patients and handicaps with physical disabilities. The physically impaired patients with an easily maneuverable wheelchair who had endured losing their extremities as a result of an accident, ageing, or illness. Due to losing both of their arms and legs, these individuals are unable to utilize an electric wheelchair with joystick or a manual wheelchair. The way this wheelchair moves is controlled by head movements. In the direction of the head, the wheelchair will move.

Keyword: MPU-6050, ATmega328p, l298n, ultrasonic sensor

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Air Quality Monitoring System with Image Processing Application

Nayef Ahmed[1], Sahil Hamdan[1], Mohammed Muzaffer[1], Safra[1], Mohammed Zakir Bellary[1*]

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Abstract:

With the constant increase in the population there has always been a need to develop newer sources of work for the masses which has led to massive industrialization. Adding to the misery is the increased use of motor vehicles. This in turn has led to a worrying sight for us to witness which will be even worse for our future generations if not addressed to the earliest. Going forward a cheap and effective system is a small step in curbing this issue

The Air Quality sensing model based on IoT senses the level of gases such as CO2, NH3, NOx etc and sends a message signal when the safe level is breached. A similar approach is adopted for sensing the level of dust with the help of a dust sensor. In addition to this we would be including a feature to detect and display the temperature and humidity of that enclosure This application would be beneficial in the field of medical research and for conducting a survey on lung cancer patients being affected by pollution which is rare but equally harmful as the problem developed due to smoking. This would help us to take the necessary steps to minimize such a fatality with the future generations to come.

Key-words: IoT, temperature, Air Quality

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GESTURE CONTROLLED WHEELCHAIR

Mavil Fernandes[1], Mohammad[1], Junaid Farhan Abdulla[1], Tenson Jose[1*]

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Abstract:
Contemporary wheelchairs, incorporating advanced robotic technologies, often remain inaccessible to millions of individuals with disabilities due to their prohibitive costs, technical constraints, and safety concerns. This paper introduces a novel solution: a gesture controlled smart wheelchair system integrated with an Internet of Things (IoT)-enabled fall detection mechanism aimed at addressing these challenges. By employing a Convolutional Neural Network (CNN) model alongside computer vision algorithms, the system can interpret gestures and autonomously maneuver the wheelchair accordingly. Additionally, it ensures user safety through IoT-based fall detection capabilities with emergency messaging systems, which promptly notify caregivers or emergency services in the event of a fall or accident. Furthermore, the smart wheelchair system is designed to be highly customizable, allowing users to tailor gesture controls to their individual preferences and needs. This customization extends to the user interface, which can be adjusted for users with varying levels of dexterity and cognitive abilities. The wheelchair's robust construction and durable materials ensure longevity and reliability, making it suitable for both indoor and outdoor use. In terms of affordability, the development cost of this comprehensive system is modest, totaling less than USD 300. This low cost is made possible by leveraging opensource hardware and software components, as well as off-the-shelf electronic components readily available in the market. Additionally, the system is designed with ease of maintenance in mind, minimizing long-term expenses associated with repairs and upgrades. Overall, the envisioned smart wheelchair promises to be both affordable and safe, facilitating independent mobility for individuals with physical disabilities while offering customizable features to enhance user experience and adaptability.

Keywords: Computer vision; hand-gesture control; fall detection; obstacle avoidance.

SOLAR POWERED SMART QUALITY OF WATER MONITORING USING IOT ENVIRONMENT

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Abstract:

Water quality monitoring remains a critical requirement in modern times. Traditional laboratory tests for monitoring water quality are complex and time-consuming. Additionally, existing systems typically rely on constant power supplied through cables, which necessitates monitoring of the monitoring systems themselves. To address these challenges, our proposed system leverages the advancements in technology, particularly in the domains of Internet of Things (IoT) and solar energy.

The objective of our project is to develop a cost-effective, standalone, robust, and intelligent water quality monitoring system. We achieve this by utilizing affordable microcontroller boards and readily available sensors in the market. The distinguishing feature of our project is the incorporation of solar panels to power the batteries that drive the entire system. This allows the system to operate independently without the need for a constant external power supply.

Key Words: Water Quality, Internet of Things (IoT), Solar Power

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IOT-BASED AUTO-SPRINKLER SYSTEM TO MONITOR THE WATER LEVEL IN THE SOIL

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Abstract:

The designed system is developed to monitor the moisture content of the soil, we developed an IoT-based auto-sprinkler system in which we will monitor the water level in the soil using a soil sensor, carbon monoxide using an MQ7 sensor and methane gas using an MQ4 sensor. It also checks temperature and humidity using the DHT11 sensor. The motor automatically turns on and off based on the moisture content present in the soil.

Most importantly, we developed an application for our project which will continuously monitor the system and give alert messages to the sensors. The values of the sensors are displayed in this application which gets updated every 5 seconds. The hardware and software parts are connected using the Bluetooth module.Additionally, we are adding a feature to receive information on bank investments, and to sell the crops on application to the Farmers which is beneficial to both the farmers and the customers. This project will help the farmers by saving their time since this application continuously monitors what is happening in the field. This project targets the agricultural sector with a focus on making a cheaper and utility-based variant of the crop communicator in an alternative approach.

Key Words: Moisture, Internet of Things (IoT), Soil

RFID BASED BLIND AND DEAFBLIND ASSISTANT

Mohammed Zakir Bellary[1*]

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Abstract— Visually impaired people need assistance in detecting obstacles, to determine the location and getting the direction for the destination they intended to go. There are many devices in the market which will assist blind people for navigation. There are people with both visually impaired and with hearing disability who cannot be able to use those devices because most of the devices will have only voice playback for navigation. "RFID based blind and deaf assistance" helps to overcome this problem. The proposed model contains RFID tag which receives the location information from RFID emitter when he walks nearby a particular place. He will be notified by a vibrator that he has got some message. He will check the location information in braille display. The proposed model also contains sensor which alerts the individual when it detects the obstacle. He can also communicate with others through the braille key which will display the message in the LCD display.

Key Words: deaf, blind, obstacles.

AN EFFICIENT FEATURE EXTRACTION METHOD FOR COPD DETECTION USING ANN

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Abstract— Medical images are frequently generated by highly precision devices and analyzed by qualified doctors, health area is the major sector of human kind irrespective of cost everyone wants their health to be proper and if there are any abnormality early detection of the same will make the person to live longer. Unavailability of the doctors for the growing population there is 1000:1 ratio for a radiologist and patients in country like India. Due to more number of patients and lack of efficient devices it's hectic for available doctors to come to a proper decision and most of the examinations will fail. Our primary objective is to examine medical X-ray images using ANN and exploit images using MATLAB image processing toolbox, computer vision toolbox, neural network toolbox etc. To come to a conclusion of diseases like Atelectasis, Consolidation, Cardiomegaly, Edema, Effusion, Emphysema, Fibrosis, etc. For detection of diseases in early stage we come across some machine learning algorithms so that the machine will be trained in such a way it can reduce the work of the doctors by evaluating the disease based on the previous data given to the machine for training. Neural network plays an important role in classification, in this project we have considered feed-forward neural network as a classifier. Using the available features extracted from LBP algorithm the clinical data will be analyzed properly and results will be obtained using ANN.

Key word: ANN, LBP, Chest-Xray

CLOUD ASSISTED WASTEWATER MANAGEMENT IN SMART CITIES

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Abstract:

Rapid urbanization and increasing population in smart cities make it difficult to manage wastewater effectively. To solve this problem, a new system has emerged that combines air technology and smart city. This summary provides an overview of cloud-assisted wastewater management in smart cities, highlighting the advantages, components, and applications of this approach. Cloud- enabled wastewater management uses the power of cloud computing to increase the efficiency, reliability and sustainability of wastewater treatment and disposal in smart cities. It can monitor, analyse and improve various processes, manage wastewater in a timely manner, thanks to the integration of cloud-based platforms, data analysis, Internet of Things (IoT) devices and advanced sensors.

Key Words: Smart city, waste water management, cloud computing, IoT, Sensors.

ADVANCEMENTS AND FUTURE OUTLOOK OF FLEXIBLE GAS SENSORS UTILIZING FUNCTIONAL NANOMATERIALS - COMPREHENSIVE REVIEW

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Abstract:

Flexible gas sensors have emerged as a focal point in research, particularly for wearable electronics in diverse fields such as environmental monitoring, food quality assessment, and health tracking. The limitations of conventional gas sensors, including bulkiness and complexity, have spurred the development of flexible alternatives. This review explores the rapid progress in flexible gas sensor technology, emphasizing the utilization of nanomaterials. Detailed discussions cover the mechanisms of gas sensing, diverse flexible substrates, and the characterization of functional nanomaterials based on their physical and chemical properties. Each material's characteristics, including sensitivity, selectivity, response time, operating temperature, and flexibility, are thoroughly examined. Recent advancements in flexible gas sensors and their applications across various domains are highlighted. Furthermore, the review outlines future research directions, including morphology modification, functionalization, and size optimization, to enhance sensor performance and expand their applications.

Keywords: Flexible gas sensors, Nanomaterials, Wearable electronics, Sensing characteristics, Future prospects

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DENSITY BASED TRAFFIC LIGHT CONTROL SYSTEM

Mohammed Arshad Gubbi[1], Abdullah Mushaid B.N[1], Tasmiya G.S[1], Shoibha Afrin[1], Afshan N Sheikh[1], John Valder[1], Nandini S[1]*

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Abstract:

Traffic congestion is a growing concern in urban areas, and it has become crucial to explore innovative solutions to mitigate this problem. Density-based traffic signal control is a system that aims to optimize traffic flow by adjusting the timing of traffic lights based on real-time traffic density data. This paper proposes a density-based traffic signal control system that utilizes a combination of sensors and microcontrollers to monitor traffic density and adjust traffic signals accordingly. The proposed system incorporates a machine learning algorithm to predict traffic density and adjust signal timing in real-time. The system was simulated using MATLAB and Simulink and tested in a real-world scenario. The simulation results indicate that the proposed system effectively reduces traffic congestion and improves traffic flow. The proposed system has the potential to improve traffic flow in urban areas and reduce travel time, fuel consumption, and carbon emissions.

Keywords: Traffic management, Intelligent transportation systems, Internet of Things (IoT), Embedded systems.

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INNOVATIVE NANOMATERIALS AND PRINTING TECHNIQUES FOR FLEXIBLE HYBRID ELECTRONICS

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Abstract:

Recent advancements in nanomaterial synthesis and printing technologies have opened new avenues for the development of flexible hybrid electronics (FHE) in various healthcare domains. Unlike traditional cleanroom-based nano-microfabrication processes, nanomaterial printing offers cost-effectiveness, high-throughput, reliability, and scalability. This review provides an overview of the latest nanomaterials, printing methods, and system integrations for the fabrication of advanced FHE in wearable and implantable healthcare applications. It outlines strategies to improve the resolution, uniformity, flexibility, and durability of nanomaterial printing and evaluates the sensitivity, functionality, and performance of printed electronics in wearable sensors, prosthetics, and implantable health monitoring systems. The paper highlights essential material properties, sensor mechanisms, and electronic functionalities to serve as a comprehensive guide in the field.

Key words*:* Functional nanomaterials; printing of nanomaterials; flexible hybrid electronics (FHE); wearable systems.

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SPEECH DENOISING BASED ON DNN USING MATLAB

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Abstract:

Human is able to exchange information smoothly using voice under different situations such as noisy environment in a crowd and with the existence of multiple speakers It is desirable to detect the speech and recognize who is talking. In everyday life, speech doesn't arrive to our ears in a clean way but Human auditory system is remarkably capable of focusing on the target speech and separating it from noise. On the contrary artificial speech processing systems are designed to deal with clean, noise free speech. Denoising is the extraction of a signal from a mixture of signal and noise. Isolation is the main issue of segregating real voice from external clamour interferences, which may include non-discourse noise, speech interference or both, as well as space resonance. Traditionally, speech segregation is considered as a signal processing problem but latest research shows discourse segregation as a superintend learning issue centered on deep neural network (DNN), in which judicious discourse sample, orator and grumbles are deliberated from training data. This paper furnishes the summary of the analysis on supervised speech separation based on deep learning. Have to compare two types of networks applied to the same task: fully connected and convolution. The adaptive noise cancelation strategy is robust for the clamours that are moving spatially.

This research focuses on distinguishing speech from noise, using DNN-based deep learning. Deep Neural Network model improves speech performance and significantly improves system stability. Exploration of speech recognition uses a variety of techniques that seek to improve precision, one of which is the use of Deep Learning

Key words*:* Deep learning; DNN; MATLAB.

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A NOVEL CLOCK GATING APPROACH FOR THE DESIGN OF LOW-POWER LINEAR FEEDBACK SHIFT REGISTERS

Mohammed Tufail Ahamed[1], Mohammed Raihan Ahad[1], Mohammed Zakir Bellary[1*], Ameenuddin P[1].

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Abstract:

Linear Feedback Shift Registers (LFSRs) represent a fundamental component in numerous digital systems, facilitating operations ranging from sequence generation to error detection and correction. However, the pervasive use of LFSRs comes with the inherent challenge of high-power consumption, particularly in battery-powered devices and energy-constrained environments. This study introduces an innovative method to address this issue by harnessing the advantages of a gated clock approach, aimed at significantly reducing power consumption while maintaining functionality. Our approach distinguishes itself from conventional gated clock strategies by focusing on two key aspects: an optimized logic gate implementation and strategic reduction of XOR gates within the feedback network. By carefully selecting and designing logic gates tailored to minimize power consumption, coupled with judicious XOR gate reduction, we achieve remarkable power savings without compromising performance or functionality. To rigorously evaluate the effectiveness of our proposed method, we conducted extensive transistor-level simulations using standard cells in a 45nm technology node. These simulations provide detailed insights into the power characteristics and performance metrics of our approach compared to conventional implementations. The simulation results demonstrate a notable reduction in power consumption, validating the efficacy of our approach in enhancing energy efficiency in LFSRs. Furthermore, comparative analysis against existing gated clock strategies showcases superior power savings, affirming the significance of our method in practical implementations.

Key Words: This research proposes a novel gated clock approach to cut power usage in Linear Feedback Shift Registers (LFSRs), validated through transistor-level simulations in a 45nm technology.

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Message from Conference Chair

Dear Esteemed Participants and Guests,

It is with great pleasure and profound gratitude that I extend my warmest greetings to each of you as we conclude the BIOTRENDCON: International Conference on Emerging Trends in Biotechnology, held on the 23rd and 24th of April. As the Chair of this esteemed gathering, it brings me immense satisfaction to witness the culmination of our collective efforts and dedication towards advancing the frontiers of biotechnology.

The Department of Biotechnology at PACE, Mangalore, takes pride in hosting BIOTRENDCON, providing a platform for scholars, researchers, and industry professionals to converge, exchange ideas, and foster collaborations. Biotechnology, as a field, is witnessing unprecedented growth and innovation, driven by the relentless pursuit of scientific excellence and the quest for solutions to global challenges.

Throughout the conference, we have been privileged to delve into a myriad of topics ranging from molecular biology and genetic engineering to bioinformatics and biomedical applications. The presentations, discussions, and interactions have not only enriched our understanding but have also paved the way for novel insights and breakthrough discoveries.

I extend my heartfelt appreciation to all the keynote speakers, session chairs, paper presenters, and attendees for their invaluable contributions, enthusiasm, and scholarly engagement. Your dedication and passion for advancing biotechnology are instrumental in shaping the future of our discipline.

As we embark on our respective journeys beyond this conference, let us carry forward the spirit of collaboration, innovation, and excellence. May the connections forged and knowledge shared during BIOTRENDCON serve as catalysts for transformative advancements in biotechnology, driving positive change for the betterment of society.

I extend my best wishes to all participants for continued success in your research endeavors. Let us remain committed to the pursuit of excellence and the advancement of biotechnology for the betterment of humanity.

Warm regards,

Dr. Krishna Prasad N.
Chair - BIOTRENDCON
Professor & Head, Department of Biotechnology
PACE, Mangalore

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Message from Conference Convenor

Dear Esteemed Colleagues, Researchers, and Participants,

It is my utmost pleasure and honor to extend a warm welcome to each of you as we mark the conclusion of BIOTRENDCON: International Conference on Emerging Trends in Biotechnology. As the Convener of this remarkable event, I am thrilled to witness the culmination of our collective endeavours in advancing the frontiers of biotechnology.

BIOTRENDCON, organized by the Department of Biotechnology at PACE, Mangalore, has served as a platform for scholars, researchers, and industry experts to converge, exchange ideas, and explore the latest developments in biotechnology. Over the course of two days, we have had the privilege of engaging in stimulating discussions, sharing ground-breaking research findings, and forging meaningful collaborations.

I would like to express my heartfelt gratitude to all the keynote speakers, session chairs, paper presenters, and attendees for their invaluable contributions and active participation. Your enthusiasm, expertise, and commitment have been instrumental in making BIOTRENDCON a resounding success.

I would also like to extend my gratitude to the organizing committee, volunteers, sponsors, and partners for their unwavering support and dedication in making this conference a reality. Your tireless efforts have ensured the smooth execution of the event and have contributed immensely to its success.

As we conclude BIOTRENDCON and reflect on the wealth of knowledge shared and connections made, let us carry forward the spirit of collaboration, innovation, and excellence. Let us leverage the insights gained and the relationships forged during this conference to drive impactful advancements in biotechnology and address the pressing challenges facing our world today.

I am confident that the discussions and collaborations initiated during BIOTRENDCON will continue to inspire and catalyze transformative changes in the field of biotechnology. I extend my best wishes to all participants for continued success in your research endeavours and endeavours.

Thank you once again for your participation and contribution to BIOTRENDCON. May the bonds formed and the knowledge exchanged during this conference continue to propel us towards a brighter and more sustainable future.

Warm regards,

Dr. Shareefraju J. Ukkund
Convenor
BIOTRENDCON
Assistant Professor, Department of Biotechnology
PACE, Mangalore

International Conclave on Engineering Science & Technology (ICEST 24)

BIOTRENDCON 2024: INTERNATIONAL CONFERENCE ON EMERGING TRENDS IN BIOTECHNOLOGY

23rd April 2024 Tuesday – Day 1	
09:30 AM to 11:30 AM	Inauguration of ICEST-24 Inaugural address by **Mr. Sohan M.** Senior Project Manager – Infosys, Mangalore Keynote Address by **Dr. P. Nagabhushan**, VC, Vignan University, AP
11:30 AM to 11:45 AM	Refreshments
11:45 AM to 01:00 PM	Keynote address – I on topic "Immunotherapeutic Approaches to Disease Treatment: Prospects and Challenges" by **Dr. Monika Sadananda,** Professor & Chairperson, Mangalore University, Mangalore
01:00 PM to 02:00 PM	Lunch Break
02:00 PM to 02:45 PM	Track 1 Oral presentation (Food Technology)
02:45 PM to 03:30 PM	Track 2 Oral presentation (Drug Design and Nanobiotechnology)
03:30 AM to 03:45 AM	Refreshments
03:45 PM to 04:30 PM	Track 3 Oral presentation (Agricultural Biotechnology)
24th April 2024 Wednesday – Day 2	
09:30 AM to 10:30 AM	Track 4 Oral presentation (Clinical Research)
10:30 AM to 11:30 AM	Track 5 & 6 Oral presentation (Bioprocessing & Environmental Eng.)
11:30 AM to 11:45 AM	Refreshments
11:45 AM to 01:00 PM	Keynote address – II on topic "Novel therapeutic green solvents based nanoemulsions by innovative membrane emulsification technique for biomedical applications" by **Dr. Syed Usman Taqui,** Post-Doctoral Researcher, King Abdullah University of Science & Technology – KAUST, Saudi Arabia
01:00 PM to 02:00 PM	Lunch Break
02:30 PM to 03:30 PM	• Valedictory of ICEST-24 • Valedictory address by **Dr. A. M. Khan,** Senior Professor, Dept. of Electronics & Director- Skill Development Centre Mangalore University Mangalore • Keynote Address by **Dr. Surendra Kumar**, Pro-Vice Chancellor, Presidency University, Bangalore
03:30 PM to 04:00 PM	Interaction & High Tea

STRONTIUM OXIDE NANOPARTICLE: GOOD PHOTOCATALYST, PROMISING ELECTROCHEMICAL SENSOR AND ANTIOXIDANT

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Abstract:

The SrO2 nanoparticle synthesis employing plant extract has offered ecofriendly method alternate for the industry. This is the first time we are reporting SrO2 nanoparticle using plant extract as reducing agent by a simple inexpensive easiest precipitation method. The characterization techniques used for synthesized SrO2 nanoparticles were X-ray diffraction analysis (XRD), Uv-vis, FT-IR SEM, BET analysis, Raman studies, elemental mapping, and EDS. Further, the photocatalytic activity was done by changing dye concentrations, catalyst concentrations and pH under both UV light and sunlight. We also did scavenger studies for the detection of OH radical and recyclability. These nanometal oxides demonstrated superior sensitivity in cyclic voltammetry when paracetamol was used as an analyte at scan speed (10mv/s to 50mV/s) and also evaluated antioxidant property.

Key Words: Agricultural biotechnology, nanoparticle synthesis, voltammetry.

PROCESS FOR LONG-TERM ADSORPTION OF ACID BLACK 52 OF NUTRACEUTICAL INDUSTRIAL FENNEL SEED SPENT FROM AQUEOUS SOLUTION

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Abstract:

With regard to a number of experimental parameters, including pH, initial dye concentration, adsorbent dosage, adsorbent dosage, adsorbent particle size, and temperature, the potential use of coriander seed spent, a by-product of the nutraceutical industry, It was evaluated how well Acid Black 52 (AB52) dye could be distant from aqueous solutions. Analysis of variance has showed how each parameter and parameter combination affects the system's overall adsorption capability (ANOVA). Four two-parameter and five three-parameter isotherm models were used to analyse equilibrium data. The dye uptake followed a kinetic expression of pseudo-second order. Intra-particle diffusion shown that external mass transfer regulated the adsorption mechanism more so than internal mass transfer. Endothermic and nearly spontaneous AB52 dye adsorption occurred on nutraceutical industrial fennel seed waste (NIFSS). SEM pictures show that the NIFSS has a fibrous matrix with a structure of porosity that is hierarchical. The presence of ligno-cellulosic and cellulosic materials, which imparts both hydrophilic and hydrophobic qualities, was confirmed by the FTIR analysis of the waste. The outcomes demonstrated that NIFSS effectively eliminates AB52 colour from wastewater and industrial textile effluent.

Key Words: Fennel seed spent, biosorption, acid black 52, adsorption isotherms, Modelling.

VALIDATED SPECTROPHOTOMETRIC METHOD FOR TADALAFIL DETERMINATION IN DRUGS USING ARSENAZO (III) DYE

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Abstract:

A simple, rapid, selective, and highly sensitive spectrophotometric method is described for the quantitative determination of a tricyclic antidepressant drug, Tadalafil (TD) in pure and in pharmaceutical preparations. The method is based on the bromination of TD with known excess of bromine and the unreacted bromine is determined based on its ability to bleach the dye Arsenazo (III) quantitatively at 530 nm. Beer's law was obeyed over the concentration range 0.0 – 15 µg/mL. The molar absorptivity value was found to be 1.445×104 L/mole/cm, with the corresponding Sandell's sensitivity values of 0.0224 µg/cm2. The limits of detection (LOD) and quantification (LOQ) are also reported for the developed method. Intra- and inter-assay precision and accuracy of the method was established according to the current ICH guidelines. Applications of the procedure to the analysis of various pharmaceutical preparations gave reproducible and accurate results. Further, no interferences were observed from excipients and the validity of the method was tested against reference method. Percent of relative recoveries values were 98.67% to 100.52%.

Key Words: Spectrophotometric, Tricyclic Antidepressant, Bromination, Molar absorptivity.

FOOD SPOILAGE DETECTION USING CURCUMIN IMPREGNATED SMART BUTTONS

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Abstract:

Food spoilage is a major concern in industry, affecting both consumers and producers. Our research proposes a reliable and efficient solution to identify food spoilage such as fish using portable sensor buttons impregnated with natural turmeric. The active ingredient curcumin isolated from Rhizomes of Curcumin longa is known to change color from yellow to deep red on changing the pH from acidic to basic. pH of most of the freshly caught seafood products such as Indian anchovy (*Stolephorus indicus*) is around neutral (pH 7), and during pre-rigor stage pH of the meat turns slightly acidic side (~pH 6.5) which takes around 3-5 hours, and during post rigor stages enzymatic degradation produces volatile bases that in turn changes the pH to alkaline side (~7.5-8). Hence pH shift in meat from acidic to alkaline is the indicator of spoilage, which also implies that the meat is more than 3-5 h of post-harvest storage. Hence, curcumin impregnated smart button is a potable, food grade, and affordable food spoilage indicator. This technology can also be extended to various other food products by using bioactive compounds from various other plant sources that are active at different pH ranges. There is a great scope of this product while procuring food products.

Key Words: Curcumin, Indian anchovy, Smart button, Food industry, Sensors.

EXTRACTION, IDENTIFICATION AND CHARACTERIZATION OF THE LEAVES OF MEMECYLON AMPLEXICAULE

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Abstract:

Memecylon amplexicaule, also known as Suckering Memecylon, belongs to the Melastomataceae family and is commonly found in the Western Ghats. It is a small to medium-sized tree reaching 10 to 15 m in height, with opposite leaves that clasp the stem, earning it the name Clasping-leaf Memecylon. The tree bears small, pale violet flowers in axillary clusters, followed by small spherical berries maturing from green to purple. Renowned for its medicinal properties, its bark and leaves are utilized in treating ailments like diarrhea, dysentery, inflammation, fever, and menstrual cramps, often consumed with milk and cumin seeds. Traditionally, they are applied topically for wound healing and inflammation reduction. Post-COVID, its leaves and bark were found to be effective against cough, cold, and bronchitis, prepared as decoctions or syrups. Economically, Memecylon offers mordants and yellow dyes extracted from its leaves, historically used in Thai silk dyeing and Buddhist monk ropes in Sri Lanka. Its edible fruits serve as spices, while its timber is valuable for construction. Decoctions from its root and heartwood have been used to treat ailments like chickenpox and measles.

Key Words: Memecylon amplexicaule, clasping leaf, pain relief, covid, Buddhist monks.

BIOBRICK PRODUCTION BY SOLID STATE FERMENTATION OF LATTERATE SOIL USING BIOPOLYMER GUM PRODUCING BACILLUS SUBTILIS

Keerthana B. C.[1], Monika S.[1], Punya B. N.[1], Laila Jaseela A.[1*], Krishna Prasad N.[1]

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Abstract:

There are many challenges faced by the modern brick industry, including cost, shortages of raw materials and environmental impacts of production. To meet this challenge, many research methods are followed around the world. This project is aimed at the production of bio bricks using laterite quarry waste powder, *Syzygium cumini* leaf extract and bacterium *Bacillus subtilis* through the process of Solid-state Fermentation. We had four different mixtures containing Soil and water, Soil and leaf extract, Soil-water and bacteria, Soil-leaf extract, and bacteria. The brick made of leaf extract and bacteria is expected to have more compressive strength, water absorption, hardness and bacterial count. Our method of creating bio bricks from laterite quarry waste powder, solid state fermenting them with *Syzygium cumini* leaf extract and *Bacillus subtilis*, binding them, and compressing them into blocks offers significant fuel, energy, and material conversion cost savings. It also requires a lower capital investment per ton of cement and offers an ecologically sound solution. “Bio-bricks” made with this technique could be a brand, effective, and more environmentally friendly building material.

Key Words: laterite quarry waste, Bio-bricks, *Bacillus subtilis*, *Syzygium cumini*.

NONINVASIVE POTENTIOMETRIC BIOSENSOR TO ASSESS MILK SHARK KEEPING QUALITY

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Abstract:

Milk shark (*Rhizoprionodon acutus*) is highly perishable due to the liberation of ammonia due to the degradation of urea by bacterial enzyme urease, hence maintenance and monitoring of urease degradation is of utmost importance in fish freshness. We have developed a urease biosensor to assess the quality of Milk Shark by immobilizing urease on a pH electrode using sodium alginate and calcium chloride solution. Enzymatic degradation of the urea into ammonia by immobilised urease results in change in the potentials across glass electrode that can be measure by a potentiometric transducer. Milk Shark stored at 30oC showed a linear relationship between the degree of urea, liberation of the ammonia, deterioration of the freshness and the development of potentials across the urease biosensor. Hence, urease biosensor is a reliable, simple, and rapid method for the measurement of freshness of the fish flesh with high urea.

Key Words: Milk shark, *Rhizoprionodon acutus*, potentiometric, biosensor, Urease.

CLEARSIGHT- ADVANCING EARLY GLAUCOMA DETECTION

Ayishathul Azmeeya[1], K. Vaishnavi Rao[1], Lakita Ramachandra Naik[1], Shrinith N. Hebbar[1*]

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Abstract:

Glaucoma, a condition causing optic nerve damage and potential blindness, can be mitigated with early detection and treatment. Unfortunately, current diagnostic methods are often time-consuming and uncertain. To address this, a cost-effective Glaucoma detection system utilizing AI algorithms has been proposed. This computer-based technology swiftly identifies and classifies healthy and Glaucoma-afflicted eyes. By employing artificial intelligence, the system autonomously delineates optic cup and disc boundaries, generating segmented fundus images for accurate Glaucoma identification. The investigation delves into AI-enabled Glaucoma detection frameworks focusing on segmented fundus images, evaluating CNN, SVM, ANN, and Random Forest algorithms for image extraction, segmentation, and classification within the region of interest. This innovative approach offers a rapid and precise means of Glaucoma diagnosis, crucial for early intervention and preventing irreversible vision loss.

Key Words: Segmented fundus images, Optic cup and disc boundaries, Support Vector Machine, Artificial Neural Network, Convolutional Neural network, Random Forest, Region of Interest.

INFLUENCE OF MEMBRANE BIOREACTOR (MBR) UNIT DESIGNED USING LOCALLY AVAILABLE MATERIALS FOR THE RURAL RESIDENTIAL DISPOSAL

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Abstract:

The study investigates the impact of Membrane Bioreactor (MBR) units designed using locally available materials on rural residential waste disposal. The introduction outlines the importance of waste management, especially in rural areas where conventional methods may not be suitable. It introduces the Membrane Bioreactor (MBR) as an innovative solution combining biological treatment with membrane filtration for high-quality effluent. This research focuses on utilizing materials readily accessible in rural areas to construct and operate MBR units, addressing the challenges of infrastructure limitations and cost-effectiveness. The objective is to physico-chemical analysis of residential wastewater collected at waste water disposed area of residential building, design of Membrane Bioreactor (MBR) using locally available material unit for purification of the residential waste water, relevance of the designed MBR unit in quality enhancement of soil and water of residential area. The experimental procedure describes the setup using locally available materials like grass, sand, charcoal, and geotextile in different configurations to treat kitchen wastewater. The functions of these materials include phytoremediation, slow sand filtration, adsorption, and aiding in filtration and treatment. Results show improvements in soil and water quality, supporting the effectiveness of locally designed MBR units for rural waste disposal. The study's conclusion emphasizes the viability and benefits of MBR technology in improving wastewater management in rural areas.

Key Words: Membrane Bioreactor (MBR), wastewater treatment, locally available materials, sustainability.

INNOVATIONS IN ARTIFICIAL INTELLIGENCE FOR ADVANCING PHARMACEUTICAL AND BIOMEDICAL SCIENCES

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Abstract:

This paper delves into the transformative role of artificial intelligence (AI) in revolutionizing pharmaceutical and biomedical research. AI technologies, including machine learning and deep learning, have reshaped various aspects of drug discovery, development, and biomedical analysis. Leveraging vast amounts of data, AI algorithms enable predictive modeling, drug target identification, virtual screening, and optimization of drug candidates. Additionally, AI-driven approaches facilitate precision medicine by analyzing patient data to tailor treatments and predict disease outcomes. This review provides an overview of recent advancements in AI applications in pharmaceutical and biomedical studies, highlighting their potential to accelerate innovation, improve therapeutic outcomes, and address healthcare challenges.

Keywords: Artificial intelligence (AI), Pharmaceutical research, Biomedical studies, Machine learning, Drug discovery

EXPLORING THE VERSATILITY OF GOLD NANOPARTICLES (GNPS) IN BIOMEDICAL AND CLINICAL CONTEXTS: AN IN-DEPTH ANALYSIS

Bhoomika[1], Shareefraza J. Ukkund[1*]

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Abstract:

This review highlights the extensive utilization of gold nanoparticles (GNPs) across diverse fields, including environmental detection and biomedicine. GNPs possess unique characteristics like tunable surface properties and surface plasmon resonance (SPR), making them invaluable in therapy and diagnostics. Their ease of synthesis and compatibility with various ligands enhance their utility in biomedical applications, particularly in cancer treatment, antiviral, and antibacterial therapies. Additionally, GNPs serve as molecular imaging agents and contrast agents due to their optical properties. The article explores GNPs' contributions to various biomedical fields such as nuclear medicine, vaccine development, diagnostics, biosensing, and lab-on-chip applications. It delves into their size-dependent biocompatibility, biodistribution, and excretion in vivo. Furthermore, GNPs show promising potential in modern therapeutic technologies, with ongoing clinical trials highlighting their efficacy. Challenges in regulatory approval and recent insights into GNP toxicity are also discussed, paving the way for future research directions in GNP-based biomedicine.

Keywords: Gold nanoparticles (GNPs), Biomedical applications, Surface plasmon resonance (SPR), Cancer treatment, Toxicity

FRONTIERS IN BIOMEDICAL NANOTECHNOLOGY: ADVANCED HYBRID MATERIALS: A SYSTEMATIC REVIEW

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Abstract:

This review explores the growing demand for highly functionalized biomaterials in biomedical engineering, focusing on the development and application of novel organic/inorganic hybrid biomaterials. These hybrids possess multiple chemical, physical, and optical properties, making them versatile in various biomedical applications. We classify advanced organic/inorganic hybrid nanomaterials as nanoparticles and nanocomposites, detailing their structures, characteristics, and advantages. Additionally, recent trends in smart organic/inorganic hybrids and nanocomposites in medical applications are outlined. Finally, we discuss the future direction of these materials, considering current technology and limitations. Functional organic/inorganic hybrids hold great promise as advanced biomaterials for diagnosing and treating human diseases efficiently across various biomedical fields.

Keywords: Hybrid biomaterials, Nanoparticles, Medical applications, Smart materials, Future directions.

DECODING COVID-19: ANALYZING A WORLDWIDE HEALTH CRISIS

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Abstract:

The emergence of Coronavirus Disease 2019 (COVID-19) has marked the second pandemic of the twenty-first century, with staggering global implications. Originating from the Coronaviridae family, the novel strain named Severe Acute Respiratory Distress Syndrome Coronavirus-2 (SARS-CoV-2) has rapidly spread worldwide, causing immense morbidity and mortality. This review delineates the key characteristics of COVID-19, tracing its lineage within the coronavirus family and highlighting its pathogenic features, including the spike glycoprotein. Predominantly transmitted through respiratory droplets, the virus poses a significant threat to vulnerable populations, particularly the elderly and immunocompromised, leading to a spectrum of clinical manifestations ranging from flu-like symptoms to severe respiratory distress and multiorgan dysfunction. Effective preventive measures such as hand hygiene, social distancing, and mask usage are paramount in curbing transmission. Treatment strategies have evolved, with emphasis on supportive care, anticoagulation, and targeted therapies like dexamethasone, remdesivir, and tocilizumab. Furthermore, rapid advancements in vaccine development and distribution have been instrumental in mitigating the pandemic's impact. This review offers a comprehensive synthesis of the global response to COVID-19, encompassing public health measures, therapeutic interventions, and vaccination campaigns, aiming to provide insights into the multifaceted challenges and strategies in combating this unprecedented global health crisis.

Keywords: COVID-19, SARS-CoV-2, Pandemic, Therapeutic interventions, Vaccination efforts

ENHANCING SENSITIVITY: EXPLORING SILICON NANOWIRE FIELD EFFECT TRANSISTOR (SINW-FET) BIOSENSORS IN BIOMEDICAL APPLICATIONS- A SYSTEMATIC REVIEW

Munazza Begam[1], Shareefraza J. Ukkund[1*]

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Abstract:

Silicon nanowires (SiNWs) represent a promising class of one-dimensional semiconductor nanomaterials with significant potential in biomedical sensing applications. Their exceptional electronic properties offer enhanced detection sensitivity in biosensors. When combined with field-effect transistors (FETs), SiNWs form a unique biosensing platform characterized by high sensitivity and target selectivity in real-time and label-free detection. The burgeoning interest in SiNW-FETs for biomedical detection is evident. This review critically examines the progress of SiNW-FETs, with a particular focus on reversible surface modification methods. Additionally, we provide a comprehensive overview of SiNW-FET applications in DNA, protein, and microbial detection, elucidating their working principles and technical approaches. Through this review, we aim to address the challenges and opportunities in the future development of SiNW-FETs for biomedical sensing applications..

Keywords: Silicon nanowires (SiNWs), Field-effect transistors (FETs), Biosensors, Biomedical sensing, Surface modification

NANOMATERIALS IN FOCUS: A COMPREHENSIVE REVIEW OF APPLICATIONS, TOXICITY, ENVIRONMENTAL IMPACT, AND FATE

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Abstract:

In the current era, nanotechnology has emerged as a pivotal component, revolutionizing technology, engineering, and medical advancements through the utilization of nanomaterials. These materials offer unique physical, chemical, and biological properties, distinct from their bulk counterparts, rendering them indispensable in various domains. Nanomaterials are categorized based on size, shape, composition, origin, and toxicity, underscoring their diverse applications. However, the escalating utilization of nanomaterials in industry necessitates a thorough investigation into their toxicity and environmental risks. This review critically examines the applications, behavior, and toxic impacts of nanomaterials on humans, animals, and the environment. Additionally, it addresses the fate, challenges, and future imperatives for the development of safe nanotechnology to ensure sustainable progress.

Keywords: Nanotechnology, Nanomaterials, Applications, Toxicity, Environmental impact

NANOTECHNOLOGY APPLICATIONS IN CANCER DIAGNOSIS AND THERAPY: A COMPREHENSIVE OVERVIEW

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Abstract:

The application of nanoparticles (NPs) has significantly enhanced traditional cancer diagnosis methods, offering improved efficiency and speed. NPs boast exceptional properties, including larger surface area, higher volume proportion, and enhanced targeting capabilities. Their minimal toxicity to healthy cells further enhances their bioavailability and half-life, enabling functional penetration of epithelium and tissues. NPs have garnered attention across multidisciplinary fields, emerging as promising materials in various biomedical applications, particularly in disease diagnosis and treatment. Presently, numerous drugs are either formulated with or coated by nanoparticles, facilitating direct targeting of tumors or diseased organs while sparing normal tissues and cells. Metallic, magnetic, polymeric, metal oxide, quantum dots, graphene, fullerene, liposomes, carbon nanotubes, and dendrimers represent some of the nanoparticle types with potential applications in cancer diagnosis and treatment. Notably, nanoparticles have demonstrated intrinsic anticancer activity through antioxidant mechanisms and inhibition of tumor growth. Moreover, they enable controlled drug release, enhancing drug efficacy while minimizing side effects. Nanomaterials like microbubbles serve as molecular imaging agents in ultrasound imaging. This review comprehensively explores the various nanoparticle types commonly utilized in cancer diagnosis and treatment.

Keywords: Nanoparticles, Cancer diagnosis, Cancer treatment, Drug delivery, Anticancer activity

EXPLORING ANTIMICROBIAL NANOMATERIALS: AN IN-DEPTH REVIEW

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Abstract:

Microbial colonization on various surfaces poses significant health and economic risks, exacerbated by the threat of global pandemics. The integration of antimicrobial nano compounds into materials has emerged as a promising strategy to mitigate microbial adhesion and proliferation. Despite the growing interest in antimicrobial surface coatings, there remains a lack of systematic research in this domain. This article provides a thorough overview of nanomaterials-based antimicrobial coatings aimed at halting contamination spread on surfaces. The review encompasses various approaches, including simple nanomaterial deposits, embedded nanomaterials, as well as nanostructures such as nanotubes, nanowires, nanocolumns, nanofibers, nanoneedles, and bio-inspired designs.

Keywords: Antimicrobial coatings, Nanomaterials, Surface contamination, Biofilm prevention, Nanocompounds

MOLECULAR PHYLOGENY OF CONUS BILIOSUS AND THEIR VENOM (CONOPEPTIDE) BIOPROSPECTING

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Abstract:

Conidae are very diversified predatory marine gastropods known for their highly potent peptidic venom. They exhibit a remarkable range of structural and functional diverse conotoxins which are significantly having distinctive potency and specific profiles for a range of neuronal targets as a research tool with therapeutic approaches. Our study aims to identify the *Conus spp.* in Karnataka Coast and illustrate the bio-activity of therapeutically significant conopeptides, this is also specific to evolutionary questions such as measuring divergent in venomics and genetic distance. Molecular phylogeny was estimated based on mitochondrial partial gene cytochrome C oxidase subunit I (COI), 16S ribosomal RNA (16S rRNA), and 12S ribosomal RNA (12SrRNA) sequences. And venom was analysed using venom gland extract from *Conus biliosus*, subjected to proteomics analysis using LC/ESI-MS methods. Several proteins, notably disulfide isomerases, peptidases and cysteine rich venom peptides have been identified, using closely related conus species from uniport proteins database. One novel single disulfide nonapeptide hormone, derived from the conopressin/conophysin precursor sequence, have been mass spectrometrically characterized in the organic extract from venom ducts of *Conus biliosus*.

Key Words: *Conus biliosus*, Mitochondrial genes, Molecular phylogeny, Proteomics, LC/ESI-MS.

PACE Conclave 2024

DEPARTMENT OF BASIC SCIENCE

Under the umbrella of

ICEST 2024

INTERNATIONAL CONCLAVE ON
ENGINEERING SCIENCES & TECHNOLOGY

23 & 24 APRIL 2024

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Message from Conference Chair

Dear Participants, Keynote Speaker, Students, and Coordinators,

It gives me immense pleasure to welcome you all to ICIBS 2024: the International Conference in Basic & Applied Sciences. This year, we are privileged to have such a distinguished gathering.

Your presence enriches our discussions and contributes to the exchange of ideas crucial for advancements in science. To our esteemed keynote speakers, your expertise and perspective are invaluable. We eagerly anticipate your address and the insights you will share with us.

Dear students, you are the future of science, and your enthusiasm and curiosity are truly inspiring. Use this conference as an opportunity to learn, network, and grow.

To the coordinators, thank you for your hard work and dedication in organizing this event. Your efforts have made this conclave possible, and we are grateful for all that you do.

I am confident that the next two days will be filled with engaging discussions, fruitful collaborations, and memorable experiences. Let us make the most of this opportunity to learn from each other and contribute to the advancement of science.

Once again, welcome to ICIBS 2024. Let us make it a truly remarkable conclave.

Warm regards,

Prof. Ismail Shaffi A. M.

Chair- ICIBS 2024

Head, Dept. of Physics

Message from Conference Convenor

Dear Esteemed Colleagues and Participants,

Welcome International Conference in Basic & Applied Science 2024 (ICIBS-24) held under the umbrella of PACE CONCLAVE: International Conclave on Engineering Sciences & Technology – 2024 (ICEST-24).

As the Convenor of this prestigious conference, it brings me great pleasure to greet all of the participants, both in person and virtually. The key feature of this conference lies its ability to bring together brilliant individuals from all over the world to discuss innovative studies, engage in significant conversations, and influence the direction of science and technology.

During ICIBS-24, we are in a unique position to explore the boundaries of innovation, discover new solutions to critical issues, and develop multidisciplinary cooperation.

I would like to express my appreciation to our excellent keynote speakers, distinguished presenters, committed volunteers, enthusiastic members of the organizing committee, and kind sponsors for their unwavering support and efforts. Your collective contributions have been essential in transforming this event into an exemplary platform.

I urge each and every person to participate fully in the conversations, take advantage of the many chances for teamwork, and make the most of the wealth of information and experience available at this conference.

As we embark on this path of exploration and invention, let us embrace diversity of thought, harness the power of collaboration, and strive for excellence in everything we do. Together, we have the potential to effect positive change and drive progress on a global scale. Thank you for your participation, dedication, and enthusiasm. I wish you all a rewarding and inspiring experience at the ICIBS-24

Warm regards,

Dr. Supriya Bangera
Convenor
ICIBS-24
Associate Professor
Dept. of Chemistry

PACE CONCLAVE: International Conclave on Engineering Sciences & Technology – 2024 (ICEST-24)

ICIBS 2024: INTERNATIONAL CONFERENCE ON BASIC AND APPLIED SCIENCES

23rd April 2024 Tuesday – Day 1	
09:30 AM to 11:30 AM	Inauguration of ICEST-24 Inaugural address by **Mr. Sohan M.** Senior Project Manager – Infosys, Mangalore Keynote Address by **Dr. P. Nagabhushan**, VC, Vignan University, AP
11:30 AM to 11:45 AM	Refreshments
11:45 AM to 01:00 PM	Keynote Address-1 on topics "Elastic properties of liquid crystals" by **Dr. CHANDRA SHEKHAR SHETTY T,** Associate Professor, Department of PG Studies in Physics, St. Aloysius (Deemed to be University) Mangalore
01:00 PM to 02:00 PM	Lunch Break
02:00 PM to 02:45 PM	Track 1 Oral presentation
03:15 PM to 03:30 PM	Refreshments
03:30 PM to 04:15 PM	Track 2 Oral presentation
24th April 2024 Wednesday – Day 2	
09:30 AM to 11:00 AM	Track 3 Oral presentation
11:00 AM to 11:15 AM	Refreshments
11:30 AM to 01:00 PM	Keynote address – II on topic "Organic display materials " by **Dr. B. K. SAROJINI,** Professor, Industrial Chemistry, Mangalore university, Mangalagangotri, Mangalore
01:00 PM to 02:00 PM	Lunch Break
02:30 PM to 03:30 PM	• Valedictory of ICEST-24 • Valedictory address by **Dr. A. M. Khan,** Senior Professor, Dept. of Electronics & Director- Skill Development Centre Mangalore University Mangalore • Keynote Address by **Dr. Surendra Kumar**, Pro-Vice Chancellor, Presidency University, Bangalore
03:30 PM to 04:00 PM	Interaction & High Tea

INHIBITIVE ACTION OF MA SYNTHESIS AND PHOTOLUMINESCENCE PROPERTIES OF $Ca_2MgWO_6:xEr^{3+}$ PHOSPHORS

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Abstract:

In the present paper, we have successfully synthesized phosphors with the composition $Ca_2MgWO_6:xEr^{3+}$ (x = 0.5, 1, 2, 3, and 4 mol%) via the solid-state reaction method. Accurate weighed $CaCO_3$, MgO, WO_3, Er_2O_3, and the flux MgF_2, were ground for 1 hour and subjected to heating for 5 hours at 600^0C. After cooling, the mixtures were ground again and heated at 1200^oC for 5 hours. The XRD patterns of the phosphors were obtained, upon comparing the XRD patterns with the standard XRD peaks, the successful synthesis of desired phosphors was verified. In addition, Rietveld refinement was carried out to determine the lattice parameters as well as the bond lengths. Using photoluminescence spectroscopy, optimum concentration for the concentration quenching was determined and it was found to be 2 mol%. The Diffused Reflectance spectra were employed to ascertain the band gap as well as the nature of the band gap of the material. In totality, our findings revealed that the optimized phosphor possessed remarkable optical properties, positioning it as a promising candidate for various optoelectronic applications.

ADVANCING SOLID POLYMER ELECTROLYTES: HYDROXY PROPYL METHYL CELLULOSEAND MAGNESIUM SALT SYSTEMS FOR ENERGY STORAGE

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Abstract:

The present work focuses on the microstructural analysis of two different magnesium ion conducting solid polymer electrolytes based on Hydroxy Propyl Methyl Cellulose and studying their suitability for energy storage systems. Two electrolyte systems were prepared using magnesium nitrate [Mg(NO3)2.6H2O] and magnesium acetate salt [Mg(CH3COO)2.6H2O] by employing the solution casting method. XRD and FTIR analysis account for structural modification of the films upon incorporation of salt. Both systems exhibited a maximum room temperature ionic conductivity of the order of 10^{-4} S/cm. Temperature-dependent analysis of impedance accounted for the ion transport mechanism. Electrochemical Stability Window values of both systems were found to be more than 3V, indicating the efficiency of the prepared systems. Primary battery and Electric double-layer capacitor (EDLC) have been fabricated using the highest conducting electrolyte systems, and their characteristics have been analyzed.

Key Words: Solid polymer electrolytes, Magnesium ion conducting, Ionic conductivity, Arrhenius behaviour, Energy storage devices.

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METRO DOMINATION NUMBER OF MOBIUS LADDER GRAPH

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Abstract:

A subset D of the vertex set V of the graph $\mathbf{G(V, E)}$ is said to be a dominating set if every vertex in $\mathbf{V - D}$ is adjacent to at least one vertex in D. The minimum cardinality of the dominating set is called the domination number. The metro domination number is the order of a minimum dominating set which resolves as a metric as a metric set. It is denoted by $\boldsymbol{\gamma_M(G)}$. In this paper we determine on the metro domination number of Mobius ladder graph.

Keywords: Fan graph, Fire cracker graph, Dominating set, Domination number, Metric dimension, Metro domination.

CHEMICAL MODIFICATION OF TAMARIND SEED GUM FOR THE ADSORPTIVE REMOVAL OF CATIONIC DYES FROM AQUEOUS SOLUTIONS

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Abstract:

Synthesis of a hydrogel, TG-g-PAMPS by the chemical modification was achieved from the polysaccharide, tamarind seed gum (TG) using 2-acrylamido-2-methyl-1-propane sulfonic acid (AMPS) as a comonomer and N,N′-methylene-bis-acrylamide (MBA) as a crosslinking agent, through the free radical graft copolymerization technique. The newly synthesized hydrogel was characterized by field emission scanning electron microscopic technique. The efficiency of the gel was evaluated for the removal of dyes from aqueous solution, using cationic dyes, crystal violet (CV) and methylene blue (MB) as model dyes. Isothermal studies revealed that the adsorption process follows the formation of a monolayer adsorb ate on the adsorbent, confirming the Langmuir isotherm as the best fit. Additionally, the systems followed a pseudo-second-order kinetic model. Remarkably, the hydrogel demonstrated the ability to adsorb up to 9.77mg/g of CV and 13.97mg/g of MB from the dye solution with a concentration of 10mg/L. Thermodynamic studies of the adsorption process unveiled its endothermic nature. Furthermore, the negative value of Gibb's free energy confirmed the spontaneity of the adsorption process. The hydrogel demonstrated a remarkable ability to undergo five cycles of successful recyclability, as evidenced by the desorption studies.

Key Words: Hydrogel, Adsorption, Crystal Violet, Methylene Blue, Desorption.

INHIBITIVE ACTION OF MACARANGA PELTATA LEAVES (MPL) EXTRACT FOR THE CORROSION OF ALUMINIUM IN ACIDIC MEDIA

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Abstract:

The purpose of this work is to assess the inhibition effect of Macaranga peltata leaves (MPL) for aluminium corrosion in 1 M HCl solution. Both weight loss and electrochemical methodologies were utilized to investigate the corrosion inhibition properties of MPL extract in 1 M hydrochloric acid. Results demonstrated that the extract effectively retards the corrosive impact of the acid on aluminium. Furthermore, inhibition efficiency was observed to rise with escalating concentrations of the extract. Adsorption studies revealed that Langmuir adsorption isotherm is the best adsorption model applicable to the adsorption on aluminum surface. Fourier transform infrared spectroscopy was employed to identify the functional groups within the MPL extracts. Scanning electron microscopy was utilized to investigate the surface morphology of aluminum. Additionally, activation parameters such as activation energies, activation enthalpy, and activation entropy were deduced from the impact of temperature variations on both corrosion and inhibition processes. The inhibitory efficacy was correlated with the molecular structure of active components found in the extract using the density functional theory model.

Key Words: Aluminium, Corrosion, Adsorption, Scanning electron microscopy, HCl.

STRUCTURAL, THERMAL AND MECHANICAL PROPERTIES OF COPPER OXIDE DOPED PVA/PVP BLEND

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Abstract:

Using solvent casting technique, blends of polyvinyl alcohol (PVA) and polyvinylpyrrolidone (PVP) (50/50) have been synthesized and varying amounts of copper oxide (CuO) nanofiller (0, 2, 4,8,12, and 16 wt. %) were added to the blend. The films structural validity is done through XRD studies. The thermal properties of the selected nanocomposite films studied using Differential Scanning Calorimetry (DSC) technique indicates the enhancement in the thermal properties of the blends upon addition of CuO nanofillers. The mechanical properties of the films studied using Universal Testing Machine (UTM) indicates the improvement in Youngs modulus of the films with the addition of Nanoparticles.

Key Words: Nanocomposite, thermal properties, CuO nanofiller, mechanical properties.

INFLUENCE OF FUNCTIONAL GROUPS ON SECOND HARMONIC GENERATION AND STRUCTURAL PROPERTIES OF CHALCONE DERIVATIVES

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Abstract:

The chalcones 1-(4-notrophenyl)-3-(2,3,5-trichlorophenyl) prop-2-en-1-one(NTP) and1-(4-bromophenyl)-3-(2-methoxy,5-bromophenyl) prop-2-en-1-one(MBB) are synthesized using Claisen-Schmidt reaction method. These chalcones are tailored by differed functional group substitutions such as -OCH_3, -SCH_3, -Cl, -Br and NO_2. The FT-IR spectra are used for structural confirmation of these compounds. The Kurtz powder method has been employed to measure the SHG efficiency. The powder XRD is carried to evaluate the crystalline properties of these chalcones. The SGH efficiency of NTP is 0.04 and powder XRD confirms that it has crystalline structure. MBB has SHG efficiency of 0.5 and XRD study reveals that it is amorphous in nature. The influence of functional groups such as -OCH_3, -SCH_3, -Cl, -Br, and NO_2 on the SHG efficiency and crystalline properties of NTP and MBB have been analyzed. The study gives a very intriguing insight into the design of chalcone derivatives based on functional substitution.

Key Words: Chalcones, FT-IR, XRD, SHG.

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ISOLATION AND CHARACTERIZATION OF ACID-SOLUBLE PISCEAN COLLAGEN FROM SEA FISH MORONE AMERICANA

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Abstract:

The main connective tissue protein, collagen, comprises three polypeptide strands known as alpha chains. Gly-Pro-X and Gly-X-Hyp are the two most prevalent motifs in the amino acid sequence of collagen. There are many different organisms from which collagen can be extracted. Due to the bovine spongiform encephalopathy and transmissible, cattle use as the primary source of collagen has been reexamined, while collagen of porcine origin is increasingly disfavored due to religious concerns. The collagen can also be extracted from marine sources as an alternative. To increase the utilization of fish waste from the fish industries and to focus on the natural raw materials in cosmetics as they are less harmful to the skin, we used the Indian white perch tiger which is one of the common fish found in the fish waste to extract Acid soluble collagen (ASC) from it and investigated some biochemical properties. The yield of isolated ASC was found to be 0.521%. The Sodium dodecyl-sulfate-polyacrylamide gel electrophoresis (SDS-PAGE) study showed that the isolated collagen was type-I and consisted of two α subunits 1 and 2 respectively with a molecular weight of approximately 148kDa. The ultraviolet (UV) absorption spectrum of collagen showed absorption at 226nm. The Fourier transform infrared spectroscopy (FT-IR) spectrum of ASC showed the peaks for Amide-I, II, and III corresponding to functional groups of the protein. The high absorption peak was observed at 226nm which corresponds to C=O, COOH, $CONH_2$ from the Ultraviolet spectrometer.

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UNRAVELING THE POTENTIAL OF NANOSTRUCTURED MATERIALS FOR OVERCOMING CHALLENGES IN LITHIUM-ION BATTERY DEVELOPMENT: A SCIENTOMETRIC REVIEW

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Abstract:

Lithium-ion batteries (LIBs) hold immense promise for revolutionizing energy storage, provided technical hurdles such as capacity loss, material stability, safety, and cost are effectively addressed. The recent integration of nanostructured materials to mitigate limitations inherent in conventional LIB components presents a hopeful trajectory. This review meticulously traces the trajectory of research advancements concerning nanomaterials for LIBs spanning the last three decades. Through a comprehensive scientometric analysis encompassing over 100,000 publications, exponential growth in nano-LIB research since the 1990s is unveiled. Notably, China and the USA emerge as frontrunners in nano-LIB publications, with the USA dominating nano-LIB patents. In addition to scientific articles, patents are scrutinized, with USA entities leading in filed, granted, and published patents in the nano-LIB domain. The technical review scrutinizes progress and opportunities across nanostructured anodes, cathodes, electrolytes, separators, and thermal management. Nanoparticles integrated into electrolytes and separators aim to enhance conductivity and strength, while nanofluids and nanocomposite phase change materials aid in thermal regulation. Overall, nanostructures hold significant potential for optimizing LIB components, yet a comprehensive analysis encompassing all elements is imperative. Critical future endeavors must navigate the intricate tradeoffs between cost, performance, and stability to facilitate sustainable nano-LIB commercialization.

Key Words: Nanostructured materials, Lithium-ion batteries (LIBs), Scientometric analysis, Battery components, 5. Commercialization challenges

MULTIDIMENSIONAL NANO MATERIALS: SYNTHESIS TECHNIQUES AND DIVERSE APPLICATIONS

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Abstract:

Grains serve as the foundational units of numerous materials, each composed of multiple atoms. The visibility of grains is contingent upon their sizes, with conventional grain sizes typically falling within the sub-millimeter to centimeter range. Conversely, nanomaterials boast average grain sizes of less than 100 nm, facilitating property enhancements such as reduced weight and heightened strength. Serving as a crucial link between atomic/molecular and bulk systems, nanomaterials offer avenues for novel or augmented size- and shape-dependent properties, rendering them pivotal in diverse applications spanning electronics, medicine, and military defense. A paramount concern lies in the development of convenient methods for the selective functionalization of nanostructures to optimize their utility. This chapter delves into the conceptual framework, significance, properties, and synthetic methodologies of 0D, 1D, 2D, and 3D nanostructured materials (NSMs), followed by insights into their functionalization and applications in defense sectors.

Key Words: Grains, Nanomaterials, Nanostructured materials (NSMs), Functionalization, Defense applications

ADVANCING CORROSION PROTECTION: A REVIEW OF NANOCOMPOSITE COATINGS

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Abstract:

Corrosion presents significant economic and safety challenges across various industries. In response, the utilization of nanocomposite coatings for steel corrosion protection has garnered considerable attention among researchers. This review examines the potential of nanocomposite coatings in mitigating corrosion. Recent advancements in corrosion inhibition research are surveyed, with a focus on factors influencing nanocomposite performance, including types of nano-materials, size, concentrations, mixing, and additives. Specifically, alkyd resin, epoxy resin, and polyurethane composites are highlighted. Additionally, novel materials for nanocomposite coating design are discussed, along with future research directions.

Keywords: Corrosion, Nanocomposite coatings, Steel protection, Corrosion inhibition, Material design

NANOTECHNOLOGY IN WATER PURIFICATION: A COMPREHENSIVE REVIEW OF NANO-ENGINEERED ADSORBENTS

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Abstract:

This comprehensive review delves into the realm of nanotechnology in water purification, focusing specifically on nano-engineered adsorbents for the removal of contaminants, particularly dyes. As water pollution continues to pose a significant global challenge, nanotechnology offers promising solutions due to its unique properties and capabilities. The review provides an in-depth exploration of various nano-engineered adsorbents employed in water purification, highlighting their structures, synthesis methods, and mechanisms of action. Additionally, the efficacy of these adsorbents in removing dyes from water is evaluated, considering factors such as adsorption capacity, selectivity, and regeneration potential. Furthermore, the review discusses the potential challenges and future directions in the development and application of nano-engineered adsorbents for water purification. Through this comprehensive analysis, the review aims to contribute to the advancement of nanotechnology-driven solutions for addressing water pollution issues worldwide.

Keywords: Nanotechnology, Water purification, Nano-engineered adsorbents Dye removal, Contaminant removal

INVESTIGATION OF CORROSION INHIBITION BEHAVIOUR OF MILD STEEL IN HYDROCHLORIC ACID BY CARBOTHIOAMIDE BASED PYRAZOLINE DERIVATIVE USING EXPERIMENTAL AND COMPUTATIONAL APPROACHES

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Abstract:

A new compound N-methyl-3,5-diphenyl-4,5-dihydro-1H-pyrazole-1-carbothioamide (NDDP) was synthesized and analyzed using FTIR, ^{1}HNMR, and mass spectrometry. The electrochemical impedance spectroscopy and potentiodynamic polarization techniques were utilized to assess the effectiveness of NDDP as a corrosion inhibitor for mild steel. The study found that the corrosion inhibition increased as the concentration of NDDP increased, while it decreased with an increase in temperature. The highest inhibition efficiency of 82.28% was reported at a temperature of 303 K with a concentration of 50 ppm of NDDP. Statistical thermodynamic calculations were done to determine activation and adsorption parameters. Surface investigation of the metal in the presence of NDDP was conducted using SEM, AFM, and EDX techniques. Quantum chemical computations confirmed the superior anticorrosive properties of NDDP as demonstrated by electrochemical studies.

Keywords: Electrochemical impedance, Potentiodynamic polarisation, Activation, Quantum calculations.

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