International Conference on
Smart Environment Management and Solutions

Virtual Conference

ICEMS-2022

21st & 22nd April, 2022

IFERP

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International Conference on

Smart Environment Management and Solutions

(ICEMS -2022)

Virtual Conference
21st – 22nd April, 2022

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Editorial

We cordially invite you to attend the **International Conference on Smart Environment Management and Solutions (ICEMS -22)** on **21ˢᵗ–22ⁿᵈ April, 2022**.The main objective of **ICEMS -22** is to provide a platform for researchers, students, academicians as well as industrial professionals from all over the world to present their research results and development activities in relevant fields of Applied Sciences, Engineering, Technology and Management. This conference will provide opportunities for the delegates to exchange new ideas and experience face to face, to establish business or research relationship and to find global partners for future collaboration.

These proceedings collect the up-to-date, comprehensive and worldwide state-of-art knowledge on cutting edge development of academia as well as industries. All accepted papers were subjected to strict peer-reviewing by a panel of expert referees. The papers have been selected for these proceedings because of their quality and the relevance to the conference. We hope these proceedings will not only provide the readers a broad overview of the latest research results but also will provide the readers a valuable summary and reference in these fields.

The conference is supported by many universities, research institutes and colleges. Many professors played an important role in the successful holding of the conference, so we would like to take this opportunity to express our sincere gratitude and highest respects to them. They have worked very hard in reviewing papers and making valuable suggestions for the authors to improve their work. We also would like to express our gratitude to the external reviewers, for providing extra help in there view process, and to the authors for contributing their research result to the conference.

Since February 2022, the Organizing Committees have received more than 115 manuscript papers, and the papers cover all the aspects in Applied Sciences, Engineering, Technology and Management. Finally, after review, about 55 papers were included to the proceedings of **ICEMS -22.**

We would like to extend our appreciation to all participants in the conference for their great contribution to the success of **ICEMS -22** We would like to thank the keynote and individual speakers and all participating authors for their hard work and time. We also sincerely appreciate the work by the technical program committee and all reviewers, whose contributions made this conference possible. We would like to extend our thanks to all the referees for their constructive comments on all papers; especially, we would like to thank to organizing committee for their hard work.

Acknowledgement

IFERP is hosting the **International Conference on Smart Environment Management and Solutions - 2022** this year in the month of April. The main objective of Smart Environment Management and Solutions is to grant the amazing opportunity to learn about groundbreaking developments in modern industry, talk through difficult workplace scenarios with peers who experience the same pain points and experience enormous growth and development as a professional. There will be no shortage of continuous networking opportunities and informational sessions. The session will serve as an excellent opportunity to soak up information from widely respected experts. Connecting with fellow professionals and sharing the success stories of your firm is an excellent way to build relations and be known as a thoughtful leader.

I express my gratitude to all my colleagues, staffs, professors, reviewers and members of organizing committee for their hearty and dedicated support to make this conference successful.

Rudra Bhanu Satpathy
Chief Executive Officer
Institute for Engineering Research and Publication (IFERP)

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Keynote Speakers

Professor Dr. GVR Shastri
Chairman
Coastal India Development Council,
New Delhi, India

Shri. Shreegumi Dharman Vijeyen
Minister of Environment & Climate change
World Parliament Government,
Delhi, India

Dr.Ashok S. Alur
Director
Centre of Excellence for Farmer producer
Organizations Director
DoH and UHS-B -Government of Karnataka, College
of Horticulture-UHS-B premisesGKVK-Bengaluru,
India

Dr. Saravanan Raj
Director (Agricultural Extension)
National Institute of Agricultural Extension
Management (MANAGE)
(An Organization of Ministry of Agriculture &
Farmers Welfare, Government of India)Rajendranagar,
Hyderabad, India

Dr.Narayan Shrestha
Project Officer
Aberdeen City Council, Greater Aberdeen Area,
Scotland,United Kingdom

Speaker's Biography

Dr.Ashok S. Alur

Director
Centre of Excellence for Farmer producer Organizations Director
DoH and UHS-B -Government of Karnataka, College of Horticulture-UHS-B
premisesGKVK-Bengaluru, India

Dr. Ashok Alur has a PhD in Agriculture and also holds a MBA & a Post Graduate Diploma in Agricultural Extension Management. He has undergone over 10 national & international executive development & management development programs and has over two decades of experience in different areas of NRM, Agriculture, Horticulture, Rural Development, Higher Education, International Cooperation, Institutional Development, Entrepreneurship Development and promotion of FPOs etc. He is currently serving as Director Centre of Excellence for Farmer Producer Organizations & Head of NRM Division at UHS Bagalkot. Previously he has served as Vice Chancellor at Anantapur(Andhra Pradesh); Special Officer & Professor -at UHS Bagalkot; Project Coordinator at International Crops Research Institute for the Semi-Arid Tropics(ICRISAT); Program Coordinator & Head, Sustainable Agriculture in Swiss Agency for Development & Cooperation & Team Member in Agriculture-Man-Ecology, a bilateral program of Govt. of Netherlands & India. Currently he is leading the team of experts at COE-FPO in training and capacity building of FPOs in Karnataka; he has led the team of experts for Land Resource Inventorization of 300 micro watersheds, development of resources atlas & Decision Support Systems for land & water management. He spear-headed an international joint initiative of ICRISAT-FAO-CFC (Common Fund for Commodities) for promoting value chain across cereals & millets in Asia & contributed for the development of innovative institutional model for the collaborative development of agriculture sector. He was instrumental in implementing Indo-Swiss Participative Watershed Development -Karnataka & Natural Resources Management Programs in Karnataka and Tamil Nadu by promoting participative & collaborative approaches in Natural Resources Management & Watershed Development. He has also guided the Food Security Initiatives, establishment of Soil Health laboratories and popularization of concept of Custom Hiring Centres in African countries such as Mozambique & Swaziland.

He is recipient of several international awards such as CERTIFICATE OF APPRECIATION & LOYALTY AWARD from ICRISAT; HONORARY RECOGNITION from Kingdom of Thailand; HONORARY CREDENTIAL & SORGHUM RESEARCH INSTITUTE AWARDS by Liaoning Academy of Agricultural Sciences-China; CERTIFICATE OF HONOUR from Government of Swaziland and CERTIFICATE OF HONOUR from Government of Mozambique in recognition of his contributions for Food Security initiatives. He is also recipient of national awards such as DISTINGUISHED INDIAN AWARD and SCIENTIFIC ACHIEVEMENT AWARDs. Important state awards from Government of Karnataka include, SARVOTTAM SEVA AWARD; SCIENCE COMMUNICATOR AWARD & INDEPENDENCE DAY HONOUR. Ministry of Rural Development, Government of Andhra Pradesh has honoured him with STATE HONOUR for his services in agriculture and rural development. He has served/been serving on several committees & missions/delegations. He has visited over 50 countries on several international missions, delegations, assignments & has delivered keynote speeches in several national-international conferences. He has guided several students for PG & doctoral research. He has published several books, bulletins, technical- scientific papers, soil and water resources atlas. He writes regular columns several journals, magazines and news papers.

Speaker's Biography

Dr. Saravanan Raj

Director (Agricultural Extension)
National Institute of Agricultural Extension Management (MANAGE)
(An Organization of Ministry of Agriculture & Farmers Welfare, Government of India)Rajendranagar, Hyderabad, India

Dr. Saravanan Raj is a Director (Agricultural Extension) at the National Institute of Agricultural Extension Management (MANAGE) (An autonomous organization under the Ministry of Agriculture and Farmers Welfare, GoI), Hyderabad, India and CEO, Centre for Innovation and Agripreneurship, a Centre of Excellence in Agri-business Incubation and Knowledge Partner for Implementing Assistance of the Rashtriya Krishi Vikas Yojana - Remunerative Approaches for Agriculture and Allied Sector Rejuvenation (RKVY-RAFTAAR) scheme of DAC&FW, Ministry of Agriculture and Farmers Welfare, Government of India. Mentoring 300 Agri-startups from 25 staes of India. Earlier, he was Director for the Feed The Future India Triangular Training program for the capacity development of 11 African countries and six Asian countries (April- August 2018). Pogramme Director for MANAGE Internships programme and the MANAGE Young Agricultural Extensionist Programme, a community of practice for developing future ready young extensionists in rural India. Co-ordinator for the MANAGE-University alliance for advancing agricultural extension and advisory services with the focus on policy relevant research and market demand based curriculum. Course director for organizing capacity development programmes for senior and middle level agricultural development professionals on e-Extension, mExtension, Agricultural Innovation Systems and Agro-tourism, and also workshop for the capacity development of extension professionals. Has specialization in the area of ICTs for agricultural extension, social media, extension reforms, privatization, institutional pluralism and innovations, agripreneurship, agri-startups and related policy issues. His publications include five books on "Agricultural Extension: Worldwide Innovations" (2008) and "ICTs for Agricultural Extension: Global Experiments, Innovations and Experiences" (2010), ICT for Agriculture and Rural Development (2011), Mobile Phone for Agricultural Extension: Worldwide mAgri Innovations and Promise for Future (2014), What Works in Rural Advisory Services? Global Good Practice Notes (2018) and 50 articles in the referred scientific international and national journals, books and proceedings. Before joining to MANAGE, he worked as a Professor of Agricultural Extension for one and half decades in the Central Agricultural University (CAU- Imphal), Meghalaya and Arunachal Pradesh States of North-East India (for more info: www.saravananraj.in).

Speaker's Biography

Dr.Narayan Shrestha

Project Officer
Aberdeen City Council, Greater Aberdeen Area,
Scotland,United Kingdom

Dr Narayan Shrestha has obtained his Master's degree from University of Edinburgh in 1987 and PhD Degree in Animal Science from University of Aberdeen in 2000. He has more than 25 years of experience in animal Science research and development. For the last 7 years, He was directly involved in Community led Climate Challenge Fund Project in reducing Carbon emission in Scotland, Aberdeen and different Community engagement activities including Scottish Ethnic Minority Elderly People's Lunch Club for two years in Aberdeen. Currently, He is involved at Aberdeen City Council Business and Skills, City Growth Department focussing on Local Employability Partnership. Dr Shrestha has published 9 papers in peer reviewed international journals and more than 50 other publications in national journals and conference proceedings.
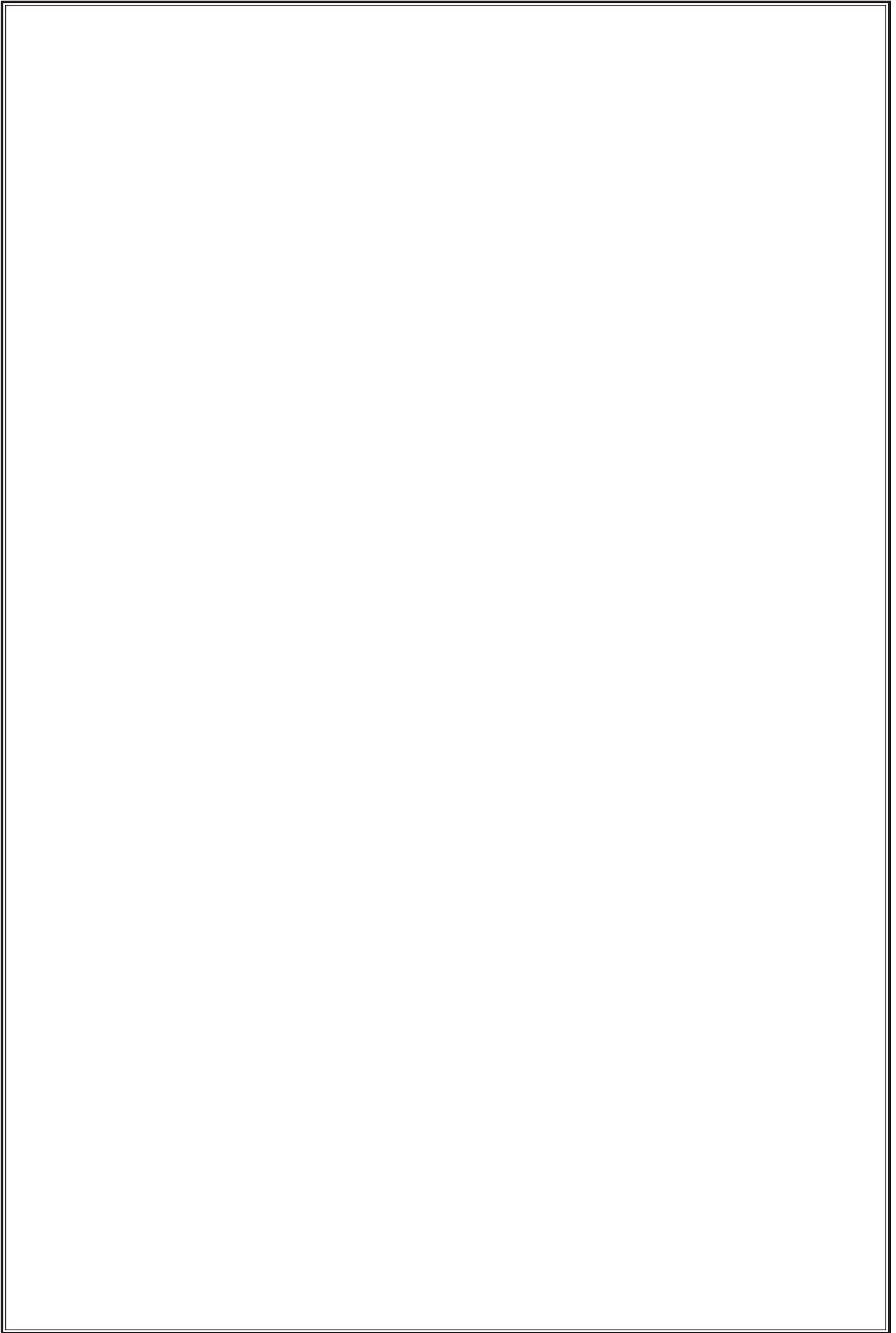
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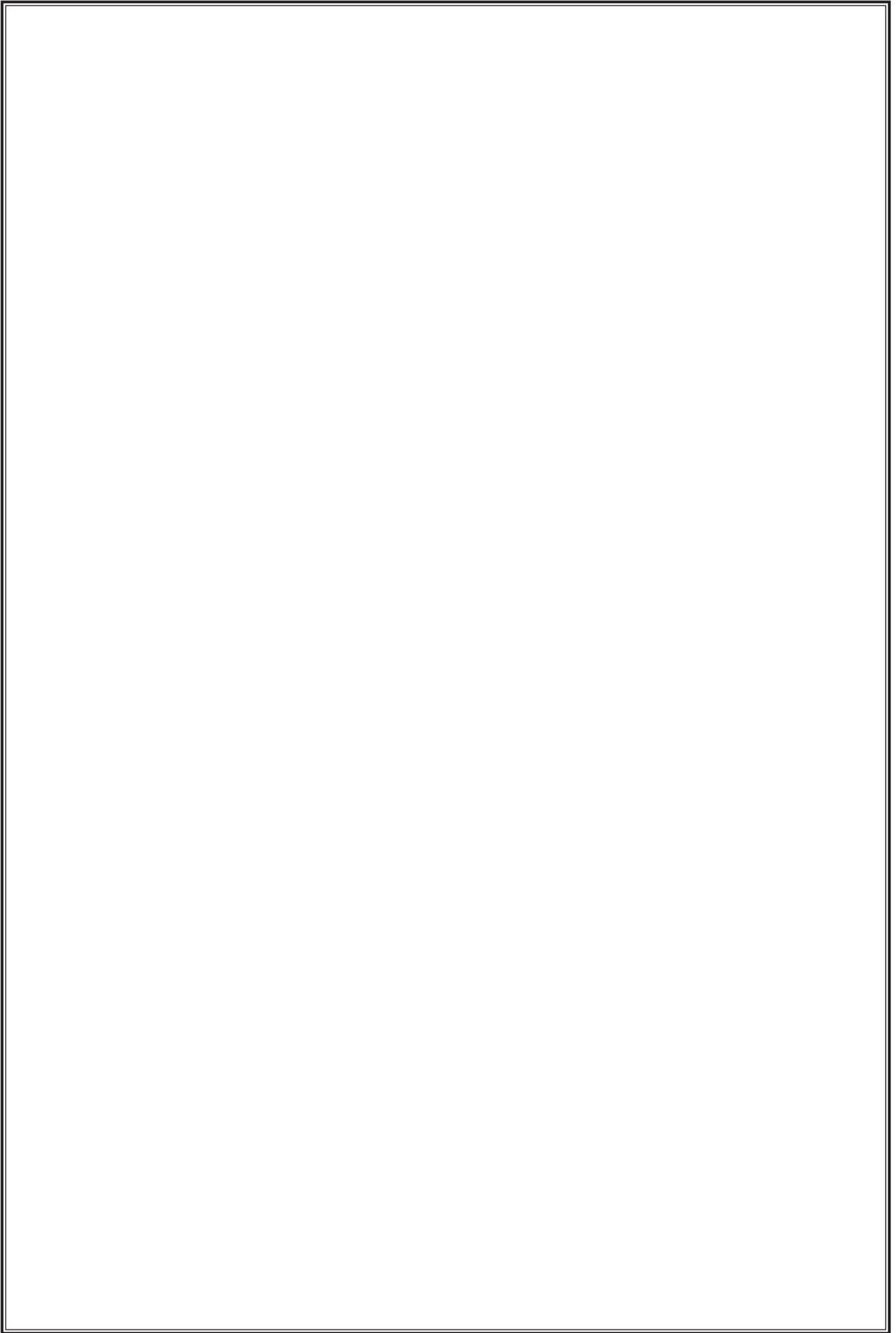
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ABSTRACTS

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Waste Utilization in Sustainable Brick Production: A Review

[1]**Aashish A. Mehta,** [2]**Vaishali J.Rajurkar,** [3]**Prasad P Dahale**

[1][2][3]Assistant Professor, Shri Ramdeobaba College of Engineering and Management, Nagpur

Abstract: Rapid infrastructure growth responsible for increasing the pollution all over the world. Infrastructure and industrial sectors are responsible for large waste generation by utilization of natural resources. New environmental regulations demands recycle of these waste material for sustainable construction. In those construction projects, bricks are utilized as one of important construction materials. Traditional fired bricks are used for the construction of bearing and non-load bearing walls construction. In traditional brick manufacturing process, clay and sand with some adhesives, where burned at very high temperature. It requires huge energy consumption during brick manufacturing process. So, a new sustainable and alternative approach for brick manufacturing process required to reduce huge energy consumption & environment pollution. In past, many researchers have used industrial and agricultural waste for brick manufacturing process. This paper provide a detail review on types of agro and industrial waste available for production of bricks. It will provide reference to understand characteristics of various waste material and their selection to achieve a rational sustainable solution.

Keywords: Sustainable Brick manufacturing, Industry waste & Agricultural waste

Identification and Assessment of Critical Financial Risks Associated with PPP Projects

[1]**Muhammad Shabeeb,** [2]**Abhay Tawalare**

[1][2][3]Department of Civil Engineering, Visvesvaraya National Institute of Technology, Nagpur, Maharashtra

Abstract: Public-Private Partnership (PPP) is an agreement between the public agency and a private sector investor to provide goods or services or infrastructure for public utilization. With a shared objective between the public and private sector, PPP projects bring in the best of both public and private sector to the realization of infrastructure projects. The PPP projects witness substantial risks in their completion which can in extreme cases results in projects' being called off. Therefore to ascertain the successful project completion, it is essential the risks are identified and mitigated successfully. Through an exhaustive literature study followed by interaction with industry experts in this domain, none important financial risks were identified that can pose significant challenges in the project execution. The risk associated with the revenue generation below anticipated levels, debt servicing risk, and interest rate volatility were found to be the three most critical financial risks. The findings of this study can be helpful in effective planning of the project in most nascent stage with respect to the proper identification of cash flows. This work can be helpful in planning of infrastructure projects in India, as there is a huge boom of infrastructure development in the country and PPP being the preferred mode of project procurement.

Application of Principal Component Analysis for the assessment of water quality of River Ganga, India

[1]**Abhishek Kumar Tripathi,** [2]**Dipteek Parmar,** [3]**Sudhir Kumar**
[4]**Mahesh Kumar Jat**
[1][3][4]Malaviya National Institute of Technology, Kanpur
[2]Harcourt Butler Technical University, Kanpur

Abstract: Among many methods which are used to examine the water quality; Water Quality Indices (WQI) is the easiest to use and most popular method. It provides a transparent picture of the status of the pollution of a water body that is why it has been widely accepted by policy makers as well as other concerned authorities. Many WQI models have been evolved all around the world, with the help of various parameters of water quality, divergent approaches to generate subindices and also implying numerous sets of mathematical procedures for subindices aggregation. The study deals with the extraction of principal components using principal component analysis (PCA), the results obtained in this study shall be used further for the formation of WQI for Ganga River in future. For the study data of the Ganga River has been collected for the year 2017-19 with respect to seven water quality parameters: temperature, ph, electrical conductivity (EC), dissolved oxygen (DO), biochemical oxygen demand (BOD), nitrate (NO3) and total coliform (TC). Results revealed that PCA led to the reduction of parameters from seven to three which were known as principal components (PC's). PCA projects the data set in the new dimensions using the variance of the data set.

A Comparative Lifecycle Assessment of Ordinary and Agrowaste Based Concrete

[1]**Akash Aneja,**[2]**R.L Sharma,** [3]**Harpal Singh**

[1]Ph.D. Research Scholar, Lovely Professional University, Phagwara, Punjab, India,

[2] SCE, Lovely Professional University, Phagwara, Punjab, India,

[3]Professor, Civil Engineering, Guru Nanak Dev Engineering College, Ludhiana, Punjab, India

Abstract: The purpose of this paper is to develop sustainable concrete incorporating rice husk biochar (RHB) as a supplementary cementitious material without compromising the concrete's performance. The physical and mechanical qualities of the composites were performed to establish whether biochar could be used to supplement cement in concrete. The environmental impact of biochar concrete is quantified with the Cradle-to-gate lifecycle assessment (LCA) approach using the IMPACT World+ framework. Different concrete mix designs having varied proportions of biochar are compared based on the following main issues: recognizing serious-environment issues like climate change, freshwater acidification, human toxicity, particulate matter formation, photochemical oxidant formation including greenhouse gases emission. Experimental results show that cement can be replaced by RHB in concrete up to 4% without affecting its compressive and flexural strengths. It has been found that the use of RHB not only solves the problem of environmental pollution but also improves the performance of the concrete. Biochar made from rice husk that has been pyrolyzed under regulated conditions possesses pozzolanic qualities that have a lower environmental impact and CO2 emissions. The research provides a valuable insight for the inclusion of biochar in concrete providing an effective way of solid agricultural waste management in developing countries.

Keywords: sustainability, biochar, compressive strength, life cycle analysis

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Dynamic Simulation for Determining the Optimum Pressure on Reverse Osmosis Plant

[1]**Mohamed A. Allam,** [2]**Hoda K. Soussa,** [3]**Ezzat Elafy**

[1]PhD Student, Irrigation and Hydraulics Department, Faculty of Engineering , Ain Shams University, Postal Code:11799, Cairo, Egypt.

[2]Professor at, , Irrigation and Hydraulics Department, Faculty of Engineering , Ain Shams University Postal Code:11799, Cairo, Egypt.

[3]Assistant Professor at, , Irrigation and Hydraulics Department, Faculty of Engineering , Ain Shams University Postal Code:11799, Cairo, Egypt.

Abstract: The goal of this study was to determine if computational fluid dynamics (CFD) analysis could enhance the performance of reverse osmosis desalination plants. Based on one spiral wound element with a diameter of 10 cm and height of 90 cm, a three-dimensional mathematical model was developed to calculate the integrated flow rate. This element was exposed to the same boundary conditions as that from El-Romela's desalination plant in Matrooh, Egypt. The inlet discharge was fixed at 2.29 m3/hr for one element in the study while varied the pressure between 50 to 74 Bar at inlet salinity ranging from 10000 to 40000 ppm. The optimum pressure was found to be 58 bars instead of 64 bars running currently, which results in a 91% reduction in power and cost.

Keywords: Reverse Osmosis; Spiral Wound Membrane; Pressure Vessels; Membrane distillation.

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Dynamic Simulation of Salinity and Pressure Effects on Reverse Osmosis Performance

[1]Mohamed A. Allam, [2]Hoda K. Soussa, [3]Ezzat Elafy

[1]PhD Student, Irrigation and Hydraulics Department, Faculty of Engineering , Ain Shams University, Postal Code:11799, Cairo, Egypt.

[2]Professor at, , Irrigation and Hydraulics Department, Faculty of Engineering , Ain Shams University Postal Code:11799, Cairo, Egypt.

[3]Assistant Professor at, , Irrigation and Hydraulics Department, Faculty of Engineering , Ain Shams University Postal Code:11799, Cairo, Egypt.

Abstract: The aim of this research was to evaluate the effect of salinity and pressure on reverse osmosis performance of spiral wound, cylindrical-shaped RO desalination apparatus. This investigation was carried out using a simple device consisting of two diaphragm pumps with pressure switches and one spiral wound membrane element with a 4.2 cm diameter and 25 cm height. Two main variables were studied: the applied hydrodynamic pressure and the salinity of the solutions. The input salinity of feed water is varied from 1000 ppm to 5000 ppm. A three-dimensional mathematical model was developed to calculate the average flow rate of brackish water on spiral wound membrane. The simulated results were compared to the experimental observations and found to be in satisfactory agreement. The results of both experimental and numerical studies showed that the output flux is inversely proportional with input salinity and directly proportional to the pressure whereas the output salinity remained constant during the operation time.

Keywords: Reverse Osmosis; Spiral Wound Membrane; Pressure Vessels; Membrane distillation.
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An Adaptive Method for Traffic Signal Control Based on Fuzzy Logic With Webster and Modified Webster Formula Using SUMO Traffic Simulato

[1]**Anu,** [2]**Ashok**

[1] ME Scholar Communication Networking Engineering Department, KCET VNR,

[2]Assistant Professor, Communication Networking Department, KCET VNR

Abstract: In the past, the Webster optimal cycle time formula was limited to calculate the optimal cycle from historical data for fixed-time traffic signal control. This paper focuses on the design of an adaptive traffic signal control based on fuzzy logic with Webster and modified Webster's formula. These formulas are used to calculate the optimal cycle time depending on the current traffic situation which applying in the next cycle. The alternation of the traffic condition between two successive cycles is monitored and handled through the fuzzy logic system to compensate the fluctuation. The obtained optimal cycle time is used to determine adaptively the effective phase green times i.e. is used to determine adaptively the maximum allowable extension limit of the green phase in the next cycle. The SUMO traffic simulator is used to compare the results of the proposed adaptive control methods with fuzzy logic-based traffic control, and _fixed-time Webster and modified Webster-based traffic control methods. The proposed methods are tested on an isolated intersection. In this study, real field-collected data obtained from three, four, and five approaches intersections in Kilis/Turkey are used to test the performance of the proposed methods. In addition, to examine the efficiency of the proposed techniques at heavy demands, the arbitrary demands are generated by SUMO for a four approaches intersection. The obtained simulation results indicate that the proposed methods over perform the fixed time and fuzzy logic- based traffic control methods in terms of average vehicular delay, speed, and travel time.
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Helical Soil Nail as an Alternative to Conventional Soil Nail for Slope Protection

[1]**Archita Goyal**, [2]**Amit Kumar Shrivastava**

[1][2] Delhi Technological University, Delhi

Abstract: Slope collapse is a natural disaster and a major calamity that our environment frequently encounters. Unstable soil slopes or loose soil fill are the major causes of this calamity. To prevent the slope from collapsing, various measures such as retaining walls, anchors, geogrids, etc. have been used. The most secure method of preventing this sort of soil slope failure is to use soil nails. Soil-nailed slopes exhibit less deformation than slopes without nails because inclusions in the soil improve shear strength and minimize horizontal displacement. Traditional soil nailing, which has been in use for over two decades, entails installing closely spaced steel bars into the pre-drilled cut and then grouting them into the soil slope as construction progresses from top-down. Substantial disruption to in situ soil is caused by pre-drilling cuts or incorrect grouting pressure. To address these issues of installation and safety, a novel notion of using helical soil nails as a support system for soil slopes has been proposed by various researchers. Helical soil nails are comprised of one or more helical plates attached to the nail shaft, which gives additional interface friction, hence enhancing the reinforcing action between soil and nail. The present paper discusses the study of helical soil nails and how they can be used for improving the slope stability of unstable soil slope.

Keywords: Slope Stability, Soil Nail, Helical Soil Nail, Shear Strength
.

Sustainable Construction Using Natural Mineral & EPS Beads In Light Weight Blocks To Form Innovative Concrete As A Green Building Materia

[1]Ashish Moon, [2]Dr. Arun Patel

[1]PhD Scholar, Department of Civil Engineering, RKDF University, Bhopal – Madhya Pradesh, India

[2] Professor, Department of Civil Engineering, RKDF University, Bhopal – Madhya Pradesh, India

Abstract: We expect to develop one more kind of light weight substantial squares by adding mineral admixture which brings about huge expansion in strength. The principle purpose for this to diminish the utilization of normally utilized unrefined substance and to build the strength of the substantial. The utilization of mineral admixture relies on accessibility of material in the close by area and for the most part on the supportability of materials. There are such countless kinds of mineral admixtures as of now accessible which can be utilized as the valuable cementitious material, for example, fly debris, calcite, silica exhaust and GGBS for example Ground Granulated impact heater slag, however these material conduct never been abundantly investigated, to observe the huge use in the light weight material substantial squares as what they act and mean for the strength property also business practicality on the lookout. To concentrate on their solidarity boundaries of material when utilized with aluminum dioxide in the light weight substantial squares..

Keywords: EPS dots, solid, pressure Strength, Replacement.
.

Study of Seismic and Wind Effect on Multi-storied Building with and without Resisting Systems.

[1]Deenay Ambade, [2]Nidhi Gosavi, [3]Vaishali Mendhe

[1][2]M.Tech Student, Department of Civil Engineering, Yeshwantrao Chavan College of Engineering, Nagpur, India.

[3] Asst. Professor, Department of Civil Engineering, Yeshwantrao Chavan College of Engineering, Nagpur, India.

Abstract: The construction of the multistoried buildings became unavoidable due to the population explosion and land scarcity. These multistoried buildings are subjected to lateral loads such as wind load and earthquake load. Thus, the safety and stability of the building become important. Wind and earthquakes are horizontal loads on structures, creating vibrations in the walls, floors, columns, and the connectors that connect them. The difference in movement between the top and bottom of the building exerts stresses, it can also induce torsion, which can cause the structure to fail; therefore, it is essential to study these horizontal forces during the design process. In this study, the seismic and wind analysis for the G+14 storey building is carried out for the different lateral load resisting systems such as bracings and shear walls by using staad.pro software. For seismic and wind evaluation, IS 1893 (Part 1): 2016 and IS 875 (Part 3): 2015 are used. This paper provides information about the variation in the base shear, storey drift, and storey displacement with the change in the resisting systems in the different seismic zones and terrain categories.
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State of the art for integrating modern technologies to develop a Sustainable Water Management Model

[1] **Patil Deshbhushan,** [2] **Rajiv Gupta**

[1] Research Scholar, Department of Civil Engineering, Birla Institute of Technology and Science, Pilani, 333031 India.

[2] Senior Professor, Department of Civil Engineering, Birla Institute of Technology and Science, Pilani 333031, India.

Abstract: Numerous fast-developing techniques such as Building Information Modelling (BIM) and Geographical Information System (GIS) are implemented in the construction industry to meet sustainability goals. BIM is a single platform that integrates different tools and practices to create the digital representation of the multiple stages of the project. BIM technology was utilized for various projects related to smart water management and smart city development, integrating GIS and remote sensing technology like Light Detection and Ranging (LiDAR). Integrated technology makes it possible to cover the entire field, incorporating geospatial information and real site situations. Water management in urban areas is critical due to the absence of management and water infrastructure. The main objective of this study is to elaborate on the existing water management practices and tools through the literature study. The bibliometric analysis gives the author's relationship and technological growth in integrating BIM, GIS, LiDAR, and countless applications. This review proposes a framework model by uniting various methodologies and techniques to create a sustainable water management system. The suggested framework model would help to achieve the long-term sustainability goals for the water management system.

Index Terms: BIM, GIS, LiDAR, Smart City, Sustainable Information Model, Water Management

Micro-structural Study Of Concrete Considering Recycled Aggregate.

[1]Hariom Khungar, [2]Dr. B.K. Vendhan, [3]Nilesh Parmar

1*Ph.D Research Scholar, S.V.N.I.T, Surat & Asst. Prof. Department of Civil Engineering , RCOEM ,Nagpur.

2Asso. Prof., Department of Civil Engineering, S.V.N.I.T, Surat.

3Asst. Prof., Department of Civil Engineering, GIDC Engineering College, Abrama ,Navsari.

Abstract The main difference between recycled concrete aggregate and natural aggregate is the presence of adhered cement mortar. This new material makes the aggregate density lower and the water absorption and Los Angeles coefficient higher, which means lower fragmentation resistance. Consequently, the quality and quantity of adhered mortar is one of the key factors controlling the quality of recycled concrete aggregates and indeed, the performance of recycled concrete. Due to the presence of attached mortar, the surface texture of the recycled coarse aggregates is found to be more porous and rougher than that of the natural aggregate. Several studies point to a strong relation between the cement hydration products and the quality of the Interfacial Transition Zone. The studies also present some properties of concrete, such as compressive strength, elastic modulus, crack propagation mechanisms and permeability to aggressive agents. These properties justify the importance of the study of aggregate-matrix ITZ. This paper presents a comprehensive review of research work done on Interfacial Transition Zone of recycled aggregate concrete.

Keywords: S.E.M., E.D.S, Alccofine, Recycled Aggregate Concrete.

Smartboi- Desktop Assistant with Accompaniment Chatbot

[1]Jyoti Rishikesh Madake, [2] Sameeran Pande, [3]Shripad Bhatlawande, [4]Swati Shilaskar

[1][2][3][4]Electronics & Telecommunication Engineering, Vishwakarma Institute of Technology Pune

Abstract: Automation is an important part of everyone's life today. Smartboi is a desktop application which serves the purpose of a virtual assistant capable of automating many processes. Smartboi is capable of opening files and folders on the desktop, starting various applications, playing videos and songs, accessing websites, etc. But what sets smartboi apart from a generic desktop assistant is its chatbot functionality. During covid-19 pandemic everyone tried to keep themselves busy with work during lockdown but every person in the lockdown must have experienced loneliness at some point during quarantine. According to the research done, people tend to feel lonely, and this eventually results into social and emotional isolation thus causing mental health deterioration or even early signs of depression. This is a very underrated and under-addressed problem to which our Indian society doesn't give much attention inspite of it being very important. The chatbot is trained to have a casual conversation with the user in a way mimicking a human presence.

Keywords: Virtual Assistant, Desktop Assistant, Natural Language Processing, Natural Language Understanding, Rasa Chatbot.

Development of Soil health and Nutrient Monitoring Module Using Jetson Nano

[1]**Jyoti Rishikesh Madake,** [2]**Shripad Bhatlawande,** [3]**Favin Fernandes**
[4]**Gauravi Dungarwal,** [5]**Vaishnavi Bhoite,** [6]**Ishan Kareliya,** [7]**Swati Shilaskar**

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

Abstract: The Agriculture domain in India is an essential contributor to the economic success of our country. The crop yield mainly depends on the nutrient availability namely, Nitrogen, Phosphorus, Potassium values of the soil, along with moisture level and temperature. A system has been proposed in this paper, to monitor and conduct predictive analysis of nutrients required for the soil. Measurement of temperature using an SHT10 temperature sensor, Measurement of soil moisture and water inside plants by using M5Stack and the soil nutrient contents namely N(nitrogen), P(phosphorus), K(potassium) values using NPK Sensor which is obligatory to determine how much additional water and nutrient content is needed in the soil to increase the nutrient quality of the soil. All the sensors are integrated together implementing it with the Nvidia Jetson Nano developer kit. This enables monitoring of fertility of the soil and other parameters such as temperature, moisture, NPK values; this data is then transmitted to machine learning models like XGBoost and Decision tree for crop/fertilizer recommendation and then the readings of the sensors are uploaded to a cloud platform named Thingspeak. Based on the displayed data, Soil nutrient analysis required for the soil leads to improving the soil quality.

Keywords: NPK Values, SHT10 moisture sensor, NPK Sensor, M5Stack Earth sensor, Jetson Nano

Environmental Loss Assessment using Green GDP

Kamesh T M

Research Scholar, Department of Agricultural Economics, Centre for Agricultural and Rural Development Studies, Tamil Nadu Agricultural University, Coimbatore , Tamil Nadu, India

Abstract: Climate system of India has a wide range of weather conditions and got affected by enormous factorsnotablyincreasing agricultural activities, changing land-use patterns leads to an increase in methane and nitrous oxide levelsaccompanied by increasing Green House Gas emissions, automobile usage, and so on. Those occurrences would lead to a less predictable and uncertain climate happenswhichmakes a major threat to the environmental system and humankind survival. An important and under-quantified impact of climate change through extreme weather change on the environmental system has to be estimated. Climate extremes such as extreme drought and extreme rainfall causeshuge economic lossesto the agriculture system and forcing the farming community to change the cropping pattern and cropping season. The activities took by the farmers to retain the fertile land from degradation due to climate extremeand to increase yieldare increased consumption of inorganic fertilizers and other activitieswhich would increase the methane and nitrous oxide emissionreflected as the degraded environment. The economic loss associated with the climate extreme is unprecedentedly large and calculation is complex and uncertain. To account for the economic losses of the environment as a result of climate change, the Green GDP concept was introduced by China in the year 2004.Data unavailability was a major obstacle in developing more extensive research work, so we considered only the GHG emissions which were collected from the World Bank database into the Green GDP accounting. GHG emission in India is increased unimaginably to 335 per cent since 1990. Hence, the Green GDP indicator is calculated as a GDP measure minus the cost of natural resources consumption minus the costs of environmental depletion. From the estimates of the Green GDP, economic loss due to GHG emission maybe around 2-6% of the GDP.

Deterministic and Parametric Approach in Graph partitioning and Diffusion based Neural Network for Smart Transportation System

[1]Mahendra G, [2]Roopashree H R

[1] Research Scholar, Department of Computer Science and Engineering, GSSSIETW, Mysuru and Affiliated to Visvesvaraya Technological University, Belagavi, Karnataka, India

[2]Associate Professor, Department of Computer Science and Engineering, GSSSIETW, Mysuru, Karnataka, India

Abstract. Accidents on roads are directly responsible for mortality and therefore safety of public is a major importance in current situation. Innovative methods are required for identification and elimination of more accident causing locations. Kernel Density Estimation (KDE), Geographic Information System (GIS) and data mining techniques are typically used in this context. Junction points and low visibility regions are identified as more accident causing locations. Forecasting the traffic congestions is very difficult due to varying traffic patterns at different times. Diffusion Convolutional Recurrent Neural Networks (DCRNNs) is a latest computational technique which can handle this challenging task effectively. This paper attempts to address the issues related to computational and memory limitations in DCRNNs. A simulated graph-partitioning method is used to decompose huge highway paths into smaller and manageable sized networks. Geographically, partitions are made based on sensor locations to forecast various traffic parameters.

Keywords: Road Accidents, Accident causing Regions, Kernel Density Estimation (KDE), Geographic Information System, Graph-Partitioning, Diffusion, Recurrent based Convolutional Neural Network, Traffic Forecasting.

MARS based prediction model for bearing capacity of shallow foundation

[1]**Manish Kumar,** [2]**Vinay Kumar,** [3]**Rahul Biswas,** [4]**Pijush Samui**

[1] SRM Institute of Science and technology (SRMIST) Tiruchirappalli

[2][4] NIT Patna

[3] NIT Sikkim

Abstract: Soil is inherently variable. The nature of soil varies horizontally as well as vertically owing to the process of formation of soil. Thus, ensuring factor of safety in geotechnical structures has been a major challenge. In shallow foundations, conducting field tests are highly expensive and time consuming and the number of tests conducted are very limited. The study proposes AI-based techniques to predict the bearing capacity of shallow foundation, simulated using the dataset contained results obtained in experiments conducted in different laboratories in the literature. The ELM and MARS model is compared with traditional Meyerhof empirical model for prediction of shallow foundation. The MARS model is concluded to be robust and reliable than ELM. The Meyerhoff model largely overestimates the output and thus concluded as reliable.

Facile synthesis of glutathione functionalized Fe_3O_4 nanochains for effective removal of Crystal Violet and Phenol Red dyes from aqueous matrix

[1]**Monalisha Behera**, [2]**Nisha Kumari**, [3]**Kaisar Raza**, [4]**Ritu Singh**

[1][2][4]Department of Environmental Science, School of Earth Sciences, Central University of Rajasthan, Ajmer-305817, Rajasthan, India

[3] Department of Pharmacy, School of Chemical Sciences and Pharmacy, Central University of Rajasthan, Ajmer-305817, Rajasthan, India

Abstract: Dye pollution is one of the significant pollutions of the present times. Around 15% of dye residues are directly released into wastewater channels without any treatment. The total estimation of dye wastes that are released into the environment are calculated to be around 7.5×10^5 tons annually which is predicted to increase real soon if not treated. The dye contaminated water bodies lose its aesthetic value and make the water unfeasible for drinking and other purposes. Dye contamination is also associated with prevention of sunlight penetration into the water, blocking photosynthesis and cellular metabolism of aquatic flora and fauna thus threatening the aquatic ecosystem. Besides, dyes are also known as serious carcinogens and mutagens. They cause serious health complications like allergic reactions, skin irritations and several hormonal dysfunctions in the exposed organisms. Hence, it is crucial to treat the dye laden wastewater before their release into the environment. Several technologies have been employed to remediate toxic and hazardous pollutants from aqueous matrices, especially dye contaminants. One of the cutting-edge removal technologies that is getting enormous attention from research communities is nanotechnology. Nanoparticles with their unique properties like large surface area, high reactivity, increased mobility and excellent removal efficiency have transformed the field of contaminant removal. Therefore, our present study is based on one such nanoparticle, i.e., glutathione functionalized Fe_3O_4 nanochains (GSH@Fe$_3$O$_4$MNPs) for the effective removal of two synthetic dyes, crystal violet (CV) and phenol red (PR) from aqueous matrix. GSH@Fe$_3$O$_4$ MNPs were synthesized through a basic wet reduction method combined with oxidative etching. In other words, Fe_3O_4 nanoparticles can be fabricated in air with controlled use of glutathione, a natural polymer. The size, shape, surface morphology, and functional groups of GSH@Fe3O4 MNPs were analysed with DLS, SEM, XRD and FT-IR instruments. The nanochain-structured GSH@Fe$_3$O$_4$ MNPs had an average size of 24 nm and an overall negative charge on the surface. The batch experiments with dyes showed that the nanosorbents have an excellent removal efficiency of 97% and 79% for CV and PR dyes, respectively, within a time interval of 60 minutes. The effect of various process parameters like adsorbent dosage, pH, temperature, reaction time, and initial dye concentration on the removal behaviour of GSH@Fe$_3$O$_4$ MNPs was investigated in detail. Langmuir isotherm fitted well for both the dyes with a brilliant adsorption capacity (qmax) of 1619.5 mg/g and 1316.16 mg/g for CV and PR dye, respectively. The experimental results were also tested for different reaction kinetics, and thermodynamic parameters. Further, GSH@Fe$_3$O$_4$ MNPs were also investigated for reusability, displaying 5 cycles of effective dye removal. Hence, the above data suggested that GSH@Fe$_3$O$_4$ MNPs have high potential for dye removal and can be employed as a good substitute for remediation of textile wastewater.

A Review on Environmental Impacts of Volatile Organic Compounds and its Measurement on Indoor Air Quality

[1]**Mythili Krishnamurthy,** [2]**Gayatri Sukumaran,** [3]**Chitra Krishnan**

[1][2][3] Sri Ramachandra Faculty of Pharmacy, Sri Ramachandra Institute of Higher Education and Research (DU), Chennai, Tamil Nadu, India

Abstract: Environmental pollution is the result of unwanted changes in our atmosphere that have risky effects on plants, animals and human beings. The World Health Organization approximates that 90% of humankind breaths polluted air. Larger concentration of pollutants are created due to human actions or natural events. Volatile organic compounds (VOCs) are low molecular weight organic chemicals which may have short and long term adverse health effects. VOCs emission became a major challenge for modern society and a global threat to vegetation and animal health. The review devoted to describe sources, social issues on environment and associated health effects of VOC exposure. Most methods used for the analysis of environmental pollutants in air rely on chromatography techniques. It is a crucial and powerful analytical tool for the efficient separation and purification of the target compound/s in complex environmental samples.

Keywords: Environment, Pollutants, Volatile organic compounds.

A Review on Photocatalysis Technology with TiO$_2$ as Catalyst for Water, Wastewater and Air Quality Treatment

[1]**Nehal Gharde,** [2]**Rajesh Bhagat,** [3]**Shantanu Khandeshwar,** [4]**Roshan Bhurse,** [5]**Ajay Gajbhiye**

[1] M.Tech. Student, Yeshwantrao Chavan College of Engineering, Nagpur, India

[2] Assistant Professor, Yeshwantrao Chavan College of Engineering, Nagpur, India

[3] Professor, Yeshwantrao Chavan College of Engineering, Nagpur, India

[4] M.Tech. Student, Yeshwantrao Chavan College of Engineering, Nagpur, India

[5] Professor, Yeshwantrao Chavan College of Engineering, Nagpur, India

Abstract: This study paper consists of photocatalytic technology for the multipurpose usage of TiO$_2$ as a catalyst for water, wastewater and air quality treatment which directly leads to cleaner environment. Photocatalysis is considered amongst the one of the cleaner technologies, with Titanium dioxide i.e., TiO$_2$ catalyst in the presence of sunlight making more possible ways for the pollutant treatment. This is based upon basic application of TiO$_2$ based photocatalysts for the total destruction of organic compounds present in polluted air and wastewaters. TiO$_2$ is photoactive in the UV range and is currently the most promising catalyst for photocatalytic breakdown of air and water. Utilization of solar irradiation can make this process energy efficient and economically viable. Several studies are conducted to develop visible light active TiO$_2$ catalyst

Keywords: photocatalysis, water, wastewater, air quality, treatment, TiO$_2$

Synthesis of Chitosan modified nZVI for anionic azo dye removal from aqueous solution: Isotherm, Kinetic and RSM modelling approach

[1]**Nisha Kumari**, [2]**Ritu Singh**

[1][2] Department of Environmental Science, School of Earth Sciences, Central University of Rajasthan, Bandarsindri, Distt. Ajmer, Rajasthan, 305817, India.

Abstract: The rising fashion business has put a lot of pressure on textile manufacturers to come up with new and unusual colour combinations regularly. Experimenting with colors and dyeing textiles produce a large amount of dye waste, which is then released into the environment. As a result, Dye pollution has emerged as a severe environmental problem in the past few decades. The exhaustive use of coloured effluents affects aquatic creatures and prevents sunlight from entering, slows down the photosynthetic activities of underwater algae and plants, causing oxygen levels in the water to be disrupted. As a result, a variety of technologies have been utilized to successfully remove dye pollution from water bodies in order to solve these challenges. Nanotechnology, on the other hand, has demonstrated remarkable adsorption capacity in the removal of a wide range of pollutants from soil and water matrices. Nanoparticles' great efficiency is due to their unique qualities of large surface area to volume ratio, high mobility, and fast reaction time. Moreover, nanoparticles are cost-effective and environmentally friendly than other modern technologies, posing no significant risk to the environment.

In the present study, zero-valent iron (nZVI) was successfully synthesized using a natural polymer, Chitosan (CS@nZVI) through a simple wet reduction approach. The synthesized nanoparticles were then characterized using various techniques such as XRD, FESEM, EDS, and FTIR. CS@nZVI was also a promising adsorbent in removing the target dye pollutants, Bromocresol green (BCG) and Coomassie Brilliant Blue (BB). When nZVI is modified with a natural polymer like Chitosan, the nanoparticles are prevented from aggregating and oxidising, and the removal efficiency is significantly increased as compared to unmodified nZVI.

The dye removal experiment was optimized using a suitable response surface methodology (RSM) method, which helps to determine the combined influence of independent variables on dye adsorption. Five independent variables were investigated to explore the adsorption of dyes, including adsorbent dosage, pH, reaction time, temperature, and dye concentration, using the Central Composite Design (CCD), one of the RSM methodologies. The results showed that the synergistic effect of pH and dye concentration substantially impacts BCG and BB removal. The coefficient of determination value ($R2$) showed that the experimental value of BB and BCG dye removal is noticeably closer to the predicted value in the process optimization (R^2 value for BB and BCG are 0.9949 and 0.9851, respectively). According to a reusability study, CS@nZVI can be used up to 5 times with good removal efficiency. This research confirms that CS@nZVI could be used as a promising functionalised nanomaterial for the degradation of dye wastewater.

Keywords: Bromocresol Green dye, Coomassie Brilliant Blue dye, Chitosan, nZVI, RSM-CCD

Assessment of Microplastics in the industrial area of Jaipur city

[1]**Prashant Kumar Jaiswal,** [2]**Ritu Singh**

[1][2] Department of Environmental Science, School of Earth Sciences, Central University of Rajasthan, Kishangarh, Ajmer, Rajasthan, India

Abstract: Across the globe, microplastics in the environment are increasingly being acknowledged for the severe threat they cause to exposed animal and human communities. There are several ways in which plastic residues can weather/degrade in the environment, including wave action, biofilm formation, solar exposure, mechanical shear, and thermal oxidation. A number of sources, including scrubbing agents in toiletries, abrasion of synthetic fabrics during washing, and the manufacturing process of large plastic objects, are responsible for microplastics entering the environment. In addition to various sources, road transport is one of the most important contributors to the influx of microplastic into the environment. The inhalation and ingestion of such microplastics from street dust is the most considerable concern, especially children being more vulnerable to this. The present study assessed the extent of microplastic pollution in street dust of Jaipur city. In order to conduct this research, roadside dust samples were collected from the industrial areas of the city.Further samples were pre-treated following organic matter digestion and density separation. Identification and quantification of microplastics were accomplished through a fluorescence microscope using Nile red dye. The experimental results of our study reveal that dust samples have an average of 358.125 ± 103.02 microplastics per hundred grams of samples. Using RAMAN spectroscopy, representative microplastics samples were identified as PVC, polyvinyl alcohol, and polyethylene.

Keywords: Microplastics, Street dust, Fluorescence microscope, RAMAN Spectroscopy

APPLICATION OF PISTACIA VERA SHELL POWDER AS AN EFFICIENT BIOADSORBENT FOR REMOVAL OF AZO-DYES FROM WATER

[1]**Prof. Priyanka Mishra**, [2]**Hitankshi Mohanty**, [3]**Ms Y Lakshmi Madhuri**

[1]Assistant Professor, School of Architecture & Planning, KIIT Deemed to be University, Bhubaneswar, Odisha, India
[2] Student, MSc Environmental Science and Management, Amity University Haryana, Panchgaon, Manesar, Haryana
[3]Assistant Professor, Department of Chemistry, St. Francis College for Women, Osmania University, Hyderabad, Telangana

Abstract: The importance of biosorption is soaring in the recent times considering the cost effectiveness, economical approach, good environmental impact, capability of being reused, safe degradation and disposal of biological sorbents, among many other benefits. A major concern in today's industrially and technologically advanced society is the harmful impact of toxic chemicals and dyes obtained as effluents from a variety of manufacturing industries, textile and chemical industries posing a potential threat to biotic life and the environment. Based on recent findings and various applications of this experiment so performed, more significant and positively impactful industrial methods have been designed keeping the perspective of green chemistry in mind. Bio-sorption as a field for remediation of toxic chemicals and dyes has been much studied where application of various kinds of bio-wastes are used for sorption of these harmful and toxic ionic salts, some of them being lead, hexavalent chromium, arsenic, bismuth, etc. This paper aims for testing adsorption capabilities of Pistacia vera in small scale application for the adsorption of methyl orange and methyl red, which are azo-dyes commonly used in the textile industries. The study proves the stability of the intrinsic physical and chemical properties of the Pista nutshell for efficient removal of azo-dyes from water. Moreover, pista shells have intrinsic anti-microbial, anti-oxidant properties that naturally help remove free radicals. Though there are many physical processes of remediation of water like sedimentation filtration, aeration, disinfection etc, bio-sorbents are proving to be more cost effective and economical, much of which can also be re-used and then remnants of which can be properly degraded and discharged.

Key words: bioadsorbents, azo-dyes, biosorption

Review on Recent Advanced Oxidation Processes for Water and Wastewater Treatment

[1]**Roshan Bhurse,** [2]**Rajesh Bhagat,** [3]**Shantanu Khandeshwar,** [4]**Nehal Gharde**
[5]**Sagar Dhengare**

[1] PG Student, Department of Civil Engineering, Yashwantrao Chavan College of Engineering and Technology, Nagpur, Maharashtra, India.

[2] Assistant Professor, Department of Civil Engineering, Yashwantrao Chavan College of Engineering and Technology, Nagpur, Maharashtra, India.

[3] Professor, Department of Civil Engineering, Yashwantrao Chavan College of Engineering and Technology, Nagpur, Maharashtra, India.

[3] Assistant Professor, Department of Civil Engineering, Yashwantrao Chavan College of Engineering and Technology, Nagpur, Maharashtra, India..

Abstract: Water is fundamental pillar of sustainable development and is finite as resource. Modern developments require more and more fresh water for household as well as industrial purpose. As time progresses requirement of water will increase but source would be depleting due to wastage and pollution. Reclamation of water is need of hour. For these cleaner water, treatment of wastewater is key aspect. AOPs are a potential solution for treating toxic and non-biodegradable industrial effluent. And is environment friendly approach and involves very little or no harmful chemicals. Fenton based AOPs are more feasible and economical but cannot be used for all types of industries. Coupling of different AOPs are promising for economical, and effective treatment and reclamation of wastewater.

Keywords: Advanced oxidation processes, Fenton, Photo-Fenton, Ozonation, Sonolysis, Wet air Oxidation, Wastewater treatment.

NEED OF CONSUMER PROTECTION ACT THROUGH EDUCATIONAL AWARENESS AMONG CCOLLEGE STUDENTS: AN INDIAN PERSPECTIVE

[1]**Sarmistha Agasti,** [2]**Jyoti Kumari Pandit,** [3]**Tahamina Yesmin**

[1][2][3] Assistant Professor, Haldia Institute of Management, W.B.

Abstract: The contemporary era is marked as the era of consumers. The philosophy of marketing is based on consumer. The consumer is not only the heart of marketing but also the controller of marketing functions. The reality consumer may be "Pivotal point of corporate activities; the present marketing scenario has shifted from product centric to buyers centric. Right from birth each and every one of us becomes a consumer but people hardly know about the rights and responsibilities they have as a consumer. There is a great need for awareness regarding consumer rights, responsibilities and the grievance handling machinery among people of all age groups. This paper aims at knowing the awareness level of students regarding the same and also spread awareness in the attempt. The protection against exploitation and unscrupulous activities of the manufacturers and traders provided by law is equal for each one of us. Then why is it that the Consumer Protection Act, 1986 is included in the Higher Secondary and Degree syllabus of Commerce stream only? This paper intends at putting forward the suggestion of the inclusion of Consumer Protection Act in Higher Secondary/ Degree syllabus of all streams of the State Board/ University so as to help build a nation of responsible citizens who can lead a secured life, away from the evil intentions of traders. After all, an aware consumer is a safe consumer.

Keywords: Consumer, Consumer protection, Issues, Grievances, Consumer Rights, Consumer Responsibilities

Utilization of Fly Ash, Rice Husk Ash and Plastic in Paver block

[1]**Satish D. Kene**, [2]**Dr. Arun Patel**

[1] Department of Civil Engineering, RKDF University, Bhopal – Madhya Pradesh, India, SVPCET ,Nagpur - Maharashtra, India

[2] Department of Civil Engineering, RKDF University, Bhopal – Madhya Pradesh, India

Abstract: The world's growing industrialization and urbanisation have resulted in a lot of infrastructure construction. This process causes a number of issues, including a shortage of building supplies and an increase in the output of garbage as well as other things. In this research work we studied the recycle of garbage like rice husk ash (RHA), fly ash (FA) and plastic. In M20 and M25 concrete, fly ash (FA) and rice husk ash (RHA) are used to partially, in place of cement, and plastic is used to partially replace the aggregate. For most of the construction work both above mix is used. The impact of partially substituting RHA and FA for cement and plastic with aggregate on concrete was thoroughly studied in this extensive experimental study. In this paper, we started with a proportion of 20% FA and 0% RHA mixed together in concrete by replacing cement, and ended with a proportion of 0% FA and 20% RHA, with a steady rise of RHA by 1% and a steady decline of FA by 1%, and waste plastic was added 10% to replace the same amount of aggregate in all proportions. To determine the physical qualities of FA, RHA, plastic, cement, and aggregate, tests were done. Paver blocks with a square shape are investigated experimentally for strength for seven days, fourteen days, twenty-four days, and fifty-four days. The results suggest that M25 concrete with a combination of (16 percent FA + 4 percent RHA) depending on cement weight and 10% plastic depending on aggregate weight has the highest compressive strength and has the potential to be used as an appropriate paver block material. Simultaneously, paver blocks' compressive strength is observed to be dropping as RHA increases.

Keywords: Plastic, Rice husk ash, Fly-ash, Paver blocks, Environmental effect and quality control.

Smart and Sustainable Materials to Improve Strength Characteristics of Cement Concrete

[1]Dr. Snehal Abhyankar, [2]Dr. Anujkumar Sharma

[1] Associate Professor ,Wainganaga College of Engineering, Nagpur,India

[2]Associate Professor,Ramdeobaba College of Engineering & Management, Nagpur,India

Abstract: This research aims at quantifying the effect of Polypropylene fibers in Pavement quality concrete mixes. It is known that the construction of rigid pavement is based on conventional cement concrete. While conventional concrete has the advantage of being strong in compression, but it is, weak in tension, less ductile, having less resistance to cracking and highly brittle. In this laboratory investigation different percentages of fibres were used to check its effect on strength characteristics of concrete mixes. The final combination was named SPFRC i.e., steel polypropylene fibre reinforced concrete. Compressive strength test and flexural strength test were conducted with different percentage of steel fibres and polypropylene fibres. IS:10262 guidelines used to design of concrete mix. The investigations result shows that there is a marginal increase in compressive strength but a considerable increase in flexural strength of concrete

Demonstration of Fabrication and Working of a Hydraulic Ram Pump

[1]**Sonam Wangmo,** [2]**Vijaya Kumar SN,** [3]**Vijay V. Nair**

[1][2] UG Students, Department of Civil Engineering, Malnad College of Engineering, Hassan, 573 202

[3] Assistant Professor, Department of Civil Engineering, Malnad College of Engineering, Hassan, 573 202

Abstract. A hydraulic ram pump is a free energy water pump that works without electricity automatically 24-hours non-stop. The hydraulic ram pump is a cost-effective solution to irrigate agricultural land, fish ponds, houses, etc., in hilly regions with flowing water sources as the operational costs are free without using fuel and electricity. It takes in water at one piezometric head and flow rate, and delivers water to a higher piezometric head at a comparatively lower flow rate. The device employs the water hammer effect to develop pressure that allows a fraction of the input water that powers the pump to be lifted to an elevation higher than where the water originally started. The ram pump was expected to work continuously and automatically purely due to the kinetic energy of flowing water by converting the kinetic energy to pressure energy. The hydraulic ram pump has two moving parts viz., waste (or impulse) valve and delivery check valve which can be easily maintained. The design and fabrication of the hydraulic ram pump was done using PVC pipes and GI valves of adequate sizes to save costs. The performance evaluation was done in and around the college campus. And after multiple trials for different working piezometric heads the hydraulic ram pump was concluded to be successfully working.

Keywords: Water hammer, ram pump, free energy.

Vulnerability Assessment of Flood Hazard Using GIS-Based Multi Criteria Decision Analysis: A Case Study of Mandakini River Basin (Uttarakhand, India)

[1]**Sreenidhi S**, [2]**Dhanya M**, [3]**Geetha P**

[1][2]Center for Wireless Networks and Applications (WNA), Amrita Vishwa Vidyapeetham, Amritapuri,India
[3] Center for Computational Engineering and Networks (CEN), Amrita Vishwa Vidyapeetham, Coimbatore, India

Abstract: The flood hazard is among the most devastating disasters wreaking havoc and causing huge impacts in the socioeconomic, ecological and financial system to a wider geographical extent. There is a need for the development of a proper food management framework to address the impacts of flood hazards. The present study depicts the mapping of zones susceptible to flood along the Mandakini River basin which is located in Uttarakhand state of. The influential factors considered for this study are land use/land cover, geomorphology, rainfall, drainage density, distance to river, slope and elevation. GIS-based Multicriteria Decision Analysis tool is used for assessing the physical and socioeconomic aspects of vulnerability in the study area with the help of a total of 119-point locations (Village/ Settlements) along with past flood points and ten-year annual average rainfall for the period 2011-2022. The resultant map with four categories (Low, Medium, High, & Very-High) of risk suggests that majority of risk belonging to moderate vulnerable zone. Also, the socioeconomic impact is high. The present results can be used as a constructive approach for flood risk management with extensive field observations and expert knowledge for validation using a large dataset.

Sustainable clothing: role of environmental knowledge, perceived store accessibility and its impact on purchase intention in Indian context

Stenzin Dawa, Sunil Kumar

University of Jammu, India

Abstract: Recent advances in sustainable clothing are combating environmental pollution and climate change. Slow fashion or sustainable clothes have been spotlighted in the fashion industry as an environmentally friendly alternative to conventional fashion products. In recent years, the number of people eager to purchase sustainable clothes and live a greener lifestyle has risen dramatically; however, it appears that green product purchases have not increased significantly. Currently there is little discussion of this topic in the literature, especially when it comes to sustainable clothing consumption. The purpose of this study is to investigate environmental knowledge and perceived store accessibility and purchase intention toward sustainable clothing in Indian context. Survey data from 282 consumers in their 20s and 30s from Jammu University, India were collected to test our hypotheses. The result of SEM show that environmental knowledge and perceived store accessibility significantly influence purchase intention toward sustainable clothing. Through the study findings, retail managers can reduce conventional clothing material usage while educating their consumers about sustainable clothing and employ more focused strategies for environmental protection.

Analysis & Modeling of Deceleration Behaviour of Light Motor Vehicles

[1]Sushant M. Gajbhiye, [2]Prof. Arun Patel

[1] PhD Scholar, Vedica Institute of Technology (RKDF University), Bhopal (MP), India

[2] Professor, Vedica Institute of Technology (RKDF University), Bhopal (MP), India

Abstract. Traffic in both developing and established countries is associated with a wide variety of different types of vehicles (HMV & LMV) having properties like physical dimensions and weights, as well as dynamic characteristics, with vehicles moving on any available section of the road capacity with respect to lane discipline. Dynamic traffic leaves a range of marks on road network and has an impact on road conditions (both morphological and structural), resulting in a rise in road traffic accidents. Even though vehicles invariably start alongside during jams which take place at Junctions, travel time (Duration & Distance Headway) for the driver increases as a result of increased traffic intensity at points of intersection. This has an impact on overall cost of the journey even though automobiles always start ahead during jams that occur at Intersections. Traffic simulator should be used to allocate traffic per channel for improved traffic flow. Vehicle deceleration characteristics are crucial for junction design, lane width design, traffic simulation system and vehicular capacity, pollution control and fuel consumption modeling. Vehicles in a homogeneous and heterogeneous traffic stream have a broad variety of physical characteristics like weight, size, hauling capacity and dynamic characteristics, all of which impact their deceleration characteristics by affecting the road characteristics and its behaviour. Previous research has focused on the deceleration behaviour of LMV vehicles (Auto & Bike) in uniform traffic. The goal of this study is to look at how different vehicle (Auto & Bike) decelerate on the Nagpur Katol Naka Highway on the outskirts of Kalmeshwar Town, India. The driver was asked to slow their vehicles from top speed to low velocity in the shortest possible time and the speed patterns were monitored using a GPS. Modeling of dynamic traffic having a multi-agent framework by considering different keywords used for the study, which can be valuable for improving traffic conditions and reducing accidents at intersections point or junctions. Modal such as single and dual regime modal developed to describe the deceleration behaviour by considering overall speed trajectories. Intelligent transportation can be used to enhance traffic conditions by employing multi-agent systems that can be maintained or employed according to traffic conditions.

Keywords: Single & dual regime model, Speed, Deceleration, Vehicle characteristics.

Assessment of Air Quality Index of RCOEM Campus

[1]**Tripti Gupta**, [2]**Srushti Chainde**, [3]**Alisha Kumbhare**, [4]**Mahendra Kadu** [5]**Khalid Ansari**

[1]Assistant Professor, Department of Civil Engineering, Shri Ramdeobaba College of Engineering and Management, Nagpur, 440013, India

[2][3]Department of Civil Engineering, Shri Ramdeobaba College of Engineering and Management, Nagpur,

[4] Professor, Department of Civil Engineering, Shri Ramdeobaba College of Engineering and Management, Nagpur,

[5] Assistant Professor, Department of Civil Engineering, Yeshwantrao Chavan College of Engineering, Nagpur, 441110, India.

Abstract: Uncontaminated and fresh air is a fundamental necessity of every living beings. But, in this day and age, air and atmosphere pollution-is definitely the most universal kind of environmental-degradation. In the atmosphere, there are several pollutants which have widespread causing contamination and pollution in the air. Pollutants of chief concern include gaseous pollutants like carbon monoxide, ozone, oxides of sulphur and nitrogen, lead etc. These are primary pollutants. Secondary pollutants are particulate matters of different types ranging from fine to high and respiratory. Every single one of these pollutants can cause a severe menace to human-health. In the current research, sensor-based equipments have been used to monitor and measure the concentration of various pollutants in the air. The effect of different pollutants like PM2.5, PM10, NO2 C02, TVOC, HCHO, Temperature, Humidity and Noise on air pollution at five stations in the RCOEM campus is studied and presented. It had been observed that air pollutants like PM2.5, PM10, and NO2 primarily affected the air quality of RCOEM campus. So, these pollutants are mainly considered to monitor and evaluate air quality of RCOEM campus. After evaluation, air quality index of RCOEM campus was found to be around 94.5. It is within the range of 51-100. So, its falls in the range of satisfactory as per central pollution control board in terms of quality of the air and thereby its pollution.

Keywords: Air, Campus, Index, Monitor, Quality, Sensor

Power and Energy Consumption in consumers terminal

[1]Prof. Trupti Deoram Tembhekar, [2]Dr.Sonalee Dhurvey

[1] Department of Electrical Engineering, Yeshwantrao Chavan College of Engineering
Nagpur, India
[2] Department of Electrical Engineering, Priyadarshini Institute of Engineering and Technology,
Nagpur, India.

Abstract: The recent trends are that more and more energy consumption is utilized in different buildings, industries, commercial areas. People are increasingly using electricity in different ways. The people continuously used the electricity. The account of that we have to save electricity at any cost. So it can be utilized in another factor. The various effective measure that has to take for saving energy consumption and to save the various resources which can be used in day-to-day life.

The paper represents various types of case studies of following consumer's terminal that will represent the energy consumption and energy saving to that consumer terminal. The paper also entitled the fact that a lot more energy is not being saved and we have to switch over to other energy resources like solar energy, wind energy, geothermal energy, biomass energy, tidal energy, ocean thermal energy, wave energy. The various types of energy are currently available and can be utilized for human benefits.

Keywords: Large consumer building; Building energy consumption; Building energy saving.

Maximum output and maximum energy efficiency in a solar system by applying solar tracker system

[1] **Bhupati Mangesh Yamatkar,** [2]**Jay Biharilal Mane,**[3]**Nehal Vijay Kamble**
[4]**Ritesh Vasant Ashtankar,**[5]**Sahil Siddharth Walke,** [6]**Sarang Rajendra Raut**
[7]**Shamal Harishchandra Dhobale,**
[8]**Prof. Trupti Deoram Tembhekar [Prof. Trupti Jayant Sakhare]**

[1][2][3][4][5][6][7] Department of Electrical Engineering, Yeshwantrao Chavan College of Engineering, Nagpur, (M.S.) India.

[8] Assistant Professor, Department of Electrical Engineering, Yeshwantrao Chavan College of Engineering, Nagpur, (M.S.) India.

Abstract: In this paper, the main aim is to track maximum amount of energy from solar system and give maximum amount of energy to solar panels by using Arduino Microcontroller. The hardware of this project has been used to track the maximum sunlight from solar system which can be utilized in solar panels. The single solar panels cannot track maximum amount of energy so we have used dual axis solar tracker system to get large energy consumption. Solar tracking achieve optimum illumination and reduce cost of generating energy consumption. Its give more energy and which can be used in future energy resources.

Keywords: Solar Energy, Solar Tracker, Arduino microcontroller.

Emergency Medical Services: A Systematic Review of Literature and Recommended Remedies

[1]**Jeevitha R,** [2]**M. Manikandakumar,** [3]**B Paavana Sai Reddy,**
[4]**C.S. Rahul Anand,** [5]**H.S Naveen Bharadwaj**

[1][2] Sr. Assistant Professor, [2][3][4]UG Scholar

[1][2][3][4][5] Department of Computer Science and Engineering New Horizon College of Engineering, Bangalore, India, 560103

[1]jeevitha.cdm@gmail.com, [2]manikandakumar.m@gmail.com, [3]paavanasai3@gmail.com,
[4]rahulanand1482004@gmail.com, [5]hsbnaveen2000@gmail.com

Abstract: The development of industrialization and urbanization has prompted a tremendous increment inside the populace constantly prompting ascend inside the amount of vehicles on street this has cost many lives which might have been saved in any case with convenient drug. This is because of vehicle traffic on the streets. The climb of the Internet of Things has offered metropolitan networks an opportunity to propel their traffic situation by using the web to assist with facilitating their traffic issues. The web has moreover helped by presenting progression, and with improvement came viability and presence of mind. Various people groups have begun using programming and applications for simplicity of voyaging. This paper targets making a rescue vehicle amicable traffic framework, by directing the traffic with the assistance of the versatile application introduced in the rescue vehicle driver's telephone works as indicated by the traffic thickness on the particular road.

Keywords: Software-Defined Networking, Internet of Things, Quality-of-Service, Routing, CNN (Convolutional neural network).

Trends and patterns in the growth of tourist flow in Khajuraho Bundelkhand during the last two decades

[1]**Lateef Ahmad,** [2]**Smiriti Tripathi**

[1][2]Institute of Environment and Development Studies, Bundelkhand University Jhansi-284128

[1] lateefnaik77@gmail.com

Abstract: Acclaimed as the World Heritage Site by UNESCO, Khajuraho temples, famous for their erotic sculptures and nagara-style architecture attracts tourist population for several decades. Kandariya Mahadeva temple being the most famous among the 22 temples at Khajuraho, this Hindu temple is the largest and arguably the most prepossessing temple of the medieval groups of shrines and temples found in Khajuraho. Witnessing a swarm of foreign and domestic tourists all year round, in the last 10 years, there has been a recessive pattern seen among the foreign travellers in Khajuraho mostly due to infrastructural challenges and scarcity of essential amenities from the tourism industry. This paper addresses the challenges faced by the tourism industry and understanding the growth pattern of tourists' influx at Khajuraho in the past two decades. Based on the findings, a conclusive inference has been framed that shall help the tourism department to arrest challenges and revive the old popularity of the place.

Keywords: Tourism, Erotic Sculptures, heritage site, Temples, Khajuraho

Network Attack Identification and Avoidance – An Executive Summary

Ms. K.Pramilarani, Dr. Vsasanthi Kumar P

[1]Senior Assistant Professor, [2]Associate Professor

[1] Research Scholar DSU, Faculty New Horizon College of Engineering, Bangalore, Karnataka, 563103

[2]Department of Computer Application, School of Engineering, Dayananda Sagar University, Bangalore, Karnataka 560068

[1]pramiselva2020@gmail.com, [2]vasanthi-bca@dsu.edu.in,

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Abstract: Internet plays a key role to connect the devices to transfer the data from one place to another place. The data generated using these devices grows more and more every second which in turn faces many challenges during data at rest and at transit. The issues arise during data transfer should be solved to maintain the confidentiality and integrity of the data. The challenges include various kinds of network threat. These attacks will be initiated by the known or unknown persons. This paper will give knowledge to secure the data in Hadoop environment along with the information about network security and network threats. Main classification of network threats and common types of network attack are explained with the way to avoid the attacks to prevent the data is proposed in this paper.

Keywords: Network threat, challenges, Hadoop, security, network attacks

Audio Interpretation to Sign Language: A Survey

[1]Ms. D. Salangai Nayagi, [2]Shivathanu R, [3]Manohar Kanth, [4]Nitish Shankar Naik

[1][2][3][4] Department of Computer Science and Engineering, New horizon College of Engineering, Bangalore ,Karnataka

[1]nayagisalangai@gmail.com, [2]Shivathanu.1nh19cs414.cse@gmail.com, [3]manoharkanthchirkar@gmail.com [4]nitishnaik05@gmail.com

Abstract: Gesture based communication, as an alternate type of the correspondence language, is essential to enormous gatherings of individuals in society. There are various signs in each communication through signing with inconstancy close by shape, movement profile, and position of the hand, face, and body parts adding to each sign. In this way, visual gesture-based communication acknowledgment is an intricate examination region in PC vision. Many models have been proposed by various analysts with critical improvement by profound learning approaches lately. In this paper, we audit the vision based proposed models of gesture-based communication acknowledgment utilizing profound taking in comes nearer from the most recent five years. While the general pattern of the proposed models shows a critical improvement in acknowledgment exactness in communication via gestures acknowledgment, there are a few difficulties yet that should be settled. We present a scientific categorization to classify the proposed models for secluded and persistent gesture-based communication acknowledgment, examining applications and future lines of exploration in the field.

Keywords: Machine Learning, Natural Language processing (NLP), Indian Sign Language (ISL),

Breast Cancer detection using convolutional neural network (deep learning)

[1]**Selvendran Ganesan,** [2]**VigneshKumar Sabapathi,** [3]**Mangaiyar Thilagam Anantharaj,** [4]**Nitheesh Kannan,** [5]**Jeeva Madheswaran**

[1]Assistant Professor, Mahendra Institute of Technology (Autonomous), Namakkal, Tamilnadu
[2][3][4][5] UG –Biomedical Engineering, Mahendra Institute of Technology Namakkal, Tamilnadu
[1]selvendranbmemit@gmail.com,[2]vigneshkumar260401@gmail.com,[3]mangaiyarthilagam00@gmail.com ,
[4]knitheesh180@gmail.com,[5]jeevamadhu30@gmail.com

Abstract: According to the world health organization (WHO) Breast cancer is the most frequent cancer among women, impacting 2.1 million women each year, and also causes the greatest number of cancer-related deaths among women in 2020, there were 2.3 million women diagnosed with breast cancer and 6,85,000 deaths globally. As of the end of 2020, there were 7.8 million women alive who were diagnosed with breast cancer in the past 5 years, making it the world's most prevalent cancer. There are more lost disability-adjusted life years (DALYs) by women to breast cancer globally than any other type of cancer. Breast cancer occurs in every country of the world in women at any age after puberty but at increasing rates. While breast cancer rates are higher among women in more developed regions, rates are increasing in nearly every region globally.

To improve breast cancer outcomes and survival, early detection is critical. There are two early detection strategies for breast cancer: early diagnosis and screening. Limited resource settings with weak health systems where the majority of women are diagnosed in late stages should prioritize early diagnosis programs based on awareness of early signs and symptoms and prompt referral to diagnosis and treatment. Early diagnosis strategies focus on providing timely access to cancer treatment by reducing barriers to care and/or improving access to effective diagnosis services. The goal is to increase the proportion of breast cancers identified at an early stage, allowing for more effective treatment to be used and reducing the risks of death from breast cancer. Since early detection of cancer is key to effective treatment of breast cancer, we use various machine learning algorithms to predict if a tumor is benign or malignant, based on the features provided by the data.

Crime Prediction and Its Analysis

[1]Srividhya Ganesan, [2]Shreyas B, [3]Sajjan Kumar, [4]Venkat Rohit Pitani

[1] Senior Assistant Professor, Computer Science and Engineering, New Horizon College of Engineering Bangalore, India

[2][3][4] Computer Science Engineering, New Horizon College of Engineering, Bangalore, Karnataka

[1]v.vidhya8@gmail.com, [2]shreyasreddy505@gmail.com, [3]sajju.kumar@gmail.com, [4]rohitpitani123@gmail.com

Abstract: Identifying criminal patterns is important for improving your response to criminal activity. This investigation analyzes criminal data from the city of Indole obtained from the public website of the Indole Police Department. The purpose is to estimate the types of crimes most likely to occur at a particular time and place in Indole. The use of AI and machine learning to detect crime using audio or video is currently working, proven to work, and may continue to grow. There is potential for using AI / ML to predict crime, or the likelihood of committing a crime, but this is an ongoing task. The most difficult task will be to "prove" to lawmakers that it works. Negatives are difficult to identify if the system is designed so that nothing happens. A positive feedback loop will certainly benefit companies that are directly involved in government armament with AI capabilities to patrol the area and predict crime. Improvements in security technology will almost certainly result in an increase in overall spending on that technology. We are also trying to make the classification work more relevant by merging many classes into larger groups. Finally, we use several classifiers to present and explain the results and explain the direction of future research.

Emerging Science of Data Storage and Security – DNA

Priya TV

Assistant Professor, Department of Cse , New Horizon College of Engineering, Bangalore, India

priya.nair2704@gmail.com

Abstract: In this present world Secure communication and high amount of data storage is needed. Security of sensitive data is the major concern. Although various cryptographic algorithms and storage methods are available computational complexity and overhead is a limitation. Hence DNA based method can be used as an alternative to electronic-based method for data storage as well as to impart security to the data on the internet. This paper is an overview of synthetic DNA and its application in the field of information technology. The applications of DNA had reached various levels; some are going to be available commercially while others are in early stage of research.

Keywords: Synthetic DNA, cryptography, Security, storage

FLY ASH AND G.G.B.S. BASED DRY GEOPOLYMER BINDER : A REVIEW

[1]**Snehal Omprakash Kotar,** [2]**Dr. Bhushan Shinde**

[1]Structural Engineering, G.H. Raisoni University Amravati, Maharashtra, India

[2]Civil Engineering, G.H. Raisoni University Amravati, Maharashtra, India

[1]snehalkotar07@gmail.com, [2]bhushan.shinde@ghru.edu.in

Abstract: As we all know concrete is the most commonly utilized substance in infrastructure building, such as large water reservoirs, skyscrapers, concrete roadways, residential and commercial buildings, and a range of many other structures. The global production of regular Portland cement (O.PC.) is growing signifies that concrete will continue to be used to address infrastructure needs and it's demand will remain as it is in the future also. The Cement manufacturing process needs a lot of energy and leads to excessive CO2 emissions to the environment. Another option for making eco- friendly concrete is to use recycled concrete. Geopolymer is the inorganic alumina-silicate polymer which we get after recycling of concrete. It is synthesized from geologically by- product materials or derived materials such as Fly ash, G.G.B.S., Red mud, R.H.A. etc. The proportion of silica and alumina is very high in fly ash as it combines with solution of alkaline to form an aluminosilicate product, which bonds the coarse, and fine aggregate and results in fine quality of concrete. Geo-polymer concrete provides a number of advantages, including increased strength and durability. Geopolymer concrete can help to reduce duration of construction and provides early age strength and ambient curing. In this paper, binding materials, alkaline-activated solution, and curing techniques are all factors to consider.

Keywords: geopolymer, fly ash, G.G.B.S., alkaline solution, aluminosilicate, curing.

Detection and Prevention of Wormhole Attack in Wireless Sensor Networks

[1]**Manikandakumar M,** [2]**Jeevitha R,** [3]**Asfar Nisha B,** [4]**Jothika R,** [5]**Nitheeskumar**

[1][2] Sr. Assistant Professor, Department of Computer Science and Engineering
New Horizon College of Engineering, Bangalore, India, 560103.
[3][4][5] UG Scholar, Department of Information Technology,
Thiagarajar College of Engineering, Madurai, India, 625015
[1] manikandakumar.m@gmail.com

Abstract: Sensors with autonomous wireless communication that can sense ambient variables and link to the Internet via a base station make up a Wireless Sensor Network (WSN). Sensor nodes are vulnerable to a variety of attacks due to their limited ability to perform typical security measures. Therefore, it is imperative to improve security. Different types of attacks that target the different layers of the network model. One among the attack type is a wormhole attack that targets the routing layer. The idea behind this attack is to tunnel data from a compromised node to one another malicious system at the other end of the network. This allows the other nodes in the wireless sensor network to believe that they are closer to other nodes than they actually are, which can lead to problems with the routing algorithm. Detecting wormhole attacks involves keeping a secure measure based on network connectivity. The proposed secure measure is applied on the Ad-hoc On-Demand Distance Vector Routing Protocol (AODV) and the experiment are tested with Network Simulator2 (NS2).

Keywords: Ad-hoc on-demand distance vector routing protocol (AODV), sensors, wireless sensor network, wormhole attack, detection and prevention, energy preservation

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