Proceedings of

International Conference

on

Recent Innovations in Science & Technology

(RIST – 2022)

08th & 09th JULY 2022

Organized by

ERANAD

KNOWLEDGE CITY

TECHNICAL CAMPUS

In association with

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EKC Technical Campus
Eranad Knowledge City
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Institute for Science, Engineering and Technology Research
and
HEXAIND Technologies & Services

ISBN: 978-81-954872-0-2

https://isetresearch.com/

https://www.rist.live/

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Message from Chairman

I am delighted in acknowledging the International Conference RIST 2022 organized by EKC Technical Campus on “Recent innovations in Science & technology”. I appreciate the organizing committee for showing a keen interest in organizing a successful Conference and contributing new ideas and research findings. I wish them for their endeavours to spread knowledge.

With regards,

Dr. C.P.A Bava Haji
Founder and Chairman
Al-Hind Educational and
Charitable Trust,
Kerala, India

Message from Executive Director

Conferences bring together people of varied experiences and provide an opportunity to everyone to share their thoughts. Mutual participation and high quality deliberations create inspiring learning environment resulting into innovative ideas. Today's industry expects such inputs to bring home new innovations and inventions. It is quite gratifying to note that our college is hosting International Conference on Recent innovations in Science and Technology (RIST 2022), on 08 and 09 July 2022.

Organizing such an event at this point of time highlights our objective ofraising an environment for the exchange of ideas headed for technological developments. I wish the conference would be able to deliberate on recentissues of national and international relevance. There have been extraordinary numbers of quality papers that are to be presented in the conference. I am sure that this occasion will deliver agregarious environment for the scholars and academicians to freely exchange the views and ideas with others. I convey my warm greetings and felicitations to the organizing committee and the participants and extend my best wishes for the success of the conference.

With Regards,

Adv. Shihab Mecheri
CEO & Executive Director
Eranad Knowledge City

Message from Executive Director

The conferences are essential to bring in values of information exchange and criticism on emerging trends in technologies. I am pleased to note that the Department of Computer Science and Engineering organizing International Conference entitled “Recent Innovations in Science and Technology (RIST 2022)”. Undoubtedly, this type of conference not only brings all the researchers, students at one platform, but it also instils the research values among the entire community of Education in the country, thereby, contributing to the growth of nation.

I hope that this conference would positively encourage innovative ideas among the contributors paving way for new discoveries and technologies. I Congratulate, the organizing team for initiating the conduction of such a conference in our esteemed Institution.

I wish the conference a grand success.

Er. Kamarudheen K P
Executive Director
Eranad Knowledge City

Message from General Manager

It is indeed a moment of immense pride for Eranad Knowledge City Technical Campus to host its International Conference RIST 2022. I take this opportunity to thank my team here at EKCTC to realize this great moment. This conference is a wonderful opportunity to not only educate students and young researchers but deepen understanding of changing ideas and innovative methods of advancement in technology. I am convinced that for students and professionals this is an excellent event that will allow you to learn many new things as well as share your experience. Wishing a great time ahead for all the participants.

Mr. Renooj Abdul Kader
General Manager
Eranad Knowledge City

Principal's Message

It gives me an immense pride that Eranad Knowledge City –Technical campus (EKC-TC) is hosting International Conference on Recent Innovation in Science and Technology (RIST 2022) in association with ISET Research on 08 and 09 July 2022. By organizing a conference at this juncture serves a platform for various forms of knowledge sharing in the field of Science and Technology irrespective of differences in time and geographical zones. This International conference RIST 2022 will act as an excellent colloquium of developing a platform for the exchange of ideas towards science and technology innovations for generation ahead and the next gen technological advancements. I wish the conference would be able to deliberate on current issues of national and international relevance in the fields of Science and Technology. I am pretty sure that on this occasion Academicians, Researchers and technocrats on their field of expertise can unreservedly exchange their thoughts and views with others on Innovations in the field. There have been unparalleled numbers of quality research articles are to be presented in the conference. Definitely this gathering of RIST 2022 would make a new path to innovate in Science and Technology.

I congratulate and appreciate the entire team for the efforts they have put forth to give this international conference its much needed color and vigor. I wish all great success for the successful conduct of the entire event and hope this mission will be carried out with even more dynamism in the future years.

Prof. (Dr) VINCE PAUL
Principal
Eranad Knowledge City Technical Campus

TABLE OF CONTENTS

Sl. No.	Title of the Paper	Page No.
1	TECHNO-ECONOMIC ANALYSIS AND OPTIMIZATION OF SOLAR AND WIND ENERGY SYSTEMS FOR POWER GENERATION AND HYDROGEN PRODUCTION IN OMAN Mathna Salah Al-Sumri, Nageswara Rao Lakkimsetty, Varghese Manappallil Joy, Karunya S, and Shaik Feroz	01
2	THREAT DETECTION IN IOT LAYERS USING ML TECHNIQUES Pavithra P.S, P. Durgadevi	02
3	ANALYSIS OF FOUR SPAN CONTINUOUS BEAM BY USING PYTHON Saravanakumar R M, Haran Pragalath D.C	02
4	EMERGING DEMANDS IN INTRUSION DETECTION SYSTEMS FOR SECURE COMMUNICATIONS Nazreen Banu. A, C.A.S. Deiva Preetha	03
5	SIMULATION OF SEMICIRCLE UWB PATCH ANTENNA WITH DGS FOR SATELLITE APPLICATIONS N.Parthiban, Dr. M. Mohamed Ismail	04
6	IOT BASED SMART METERING SYSTEM Debarun Das, Subhasis Bandopadhyay, Rupam Saha, Abhradeep Roy, Tanj Das	04
7	ANALYZING THE CLIMATE RESPONSIVE DESIGN STRATEGIES OF TRADITIONAL HOUSES IN THE HOUSING SETTLEMENTS AROUND KAYAROGESHWARAR TEMPLE AND ITS IMPACT OF URBANISATION IN NAGAPATTINAM TOWN, INDIA Purushothaman A	05
8	INFLUENCE OF GREEN HRM ON SUSTAINABLE DEVELOPMENT Sujata Das, Dr. Madhusmita Dash	05
9	AN INTELLIGENT SYSTEM FOR IDENTIFYING THE RISK OF COVID-19 USING LOGISTIC REGRESSION Ramya Venkatesan, Udaya Allani, Nimmagadda Deepa, Dr. Ashok Kumar K	06
10	DIGITIZATION OF PRODUCT QUALITY IN MANUFACTURING M. Lavanya, Manasa Kommineni, V. Harsha Vardhan	07
11	OCR: WORD TO TEXT CONVERTER Dr.Rohini R. Mergu, Ms.Vaishnavi Yemul, Ms.Vaishali Alli, Manjushri Talwar	08

12	BLOOD LEAKAGE DETECTION SYSTEM DURING HEMODIALYSIS B Gnaneshwar, A Pravalika, A Sravani, K Ashok Kumar	08
13	A COMPARATIVE STUDY OF INHERITANCE IN C++ AND JAVA Charanpreet kaur	09
14	VARIABLE ENERGY BLAST WAVES IN PRESENCE OF ELECTRIC FIELD Amit Kumar Ray	09
15	DOMINATION NUMBER FOR SOME STAR RELATED GRAPHS Pariksha Gupta, Dr. Sangeeta Gupta, Dr. Sweta Srivastav	09
16	COMPREHENSIVE ANALYSIS OF OPTIMAL APPORTIONMENT OF EV CHARGING STATION IN A RADIAL DISTRIBUTION SYSTEM. Anusha R, D Sattianadan	10
17	INTERNET OF THINGS(IOT), ITS APPLICATIONS AND FUTURE DEPENDENCY: A REVIEW Dakshesh Gupta, Samli	10
18	DEVELOPING LANGUAGE COMPETENCES OF STUDENTS THROUGH DIGITAL TECHNOLOGIES Madieva G.A, Dustbaeva N.N, Quychieva Z.I, Mustafakulova F.I.	11
19	AERODYNAMIC PERFORMANCE OF NATURE INSPIRED FOILS IMPLEMENTING SLOTS K. Sai Priyanka, Dr Muruga Lal Jeyan	11
20	DELAYING THE FLOW SEPERATION BY USING PASSAGE AND VORTEX GENERATOR TECHNIQUES K. Sai Priyanka, Dr Muruga Lal Jeyan	12
21	ROS AND MOVEIT BASED 6 DOF MANIPULATOR Vineet Prajapati, Dipanshu Shrimali, Vansh Vashist, Akanksha Mishra	12
22	DESIGN AND ANALYSIS OF DYNAMIC WIRELESS POWER TRANSFER FOR ELECTRIC VEHICLE CHARGING APPLICATION. Parthasarathi M, George Fernandez S, Arun Noyal Doss M	13
23	PERFORMANCE AND DISTANCE ENHANCEMENT OF 160 GBPS ISOWC SYSTEM USING POLARIZATION DIVISION MULTIPLEXED 256-QAM Kamalpreet Kaur, Baljeet Kaur, Gurjot Kaur Walia	14

24	DESIGN, ANALYSIS AND TOPOLOGY OPTIMIZATION OF FLOATING DISC ROTOR Vineet Kumar, Armaan Haque, Tenzin Lhaden	14
25	FABRICATION AND CHARACTERIZATION OF AZ31B NANOCOMPOSITES BY STIR CASTING PROCESS Bhaskar Thakur, Shivprakash Barve, Pralhad Pesode	15
26	INDUSTRIAL REVOLUTIONS 1.0 TO 4.0: A JOURNEY TO SUSTAINABLE MANUFACTURING Harmish Bhatt	16
27	MODELING AND REAL TIME SIMULATION OF A DFIG-BASED WIND ENERGY CONVERSION SYSTEM Subhasis Bandopadhyay, Sudip Das, Subhadip Das, Kalyan Pramanik	16
28	MOLECULAR STRUCTURE, VIBRATIONAL AND REACTIVITY DESCRIPTORS ANALYSIS OF 4-[2-(TERT-BUTYLAMINO)-1-HYDROXYETHYL]-2-(HYDROXYMETHYL)PHENOL Rubarani.P.Gangadharan	17
29	ISOLATIONAND IDENTIFICATIONOFAZODYE DEGRADING MICRO ORGANISMS Mrs.B. Mohanapriya, MustaphaUmar, Dr.C. Kanagaraj, Dr.A. Sathyapriya, Dr.S. Aravindh	18
30	COMPARITIVEANALYSISOFMACHINELEARNINGANDDEEPLEARNINGALGORITHMSINFAULTDIAGNOSISOF BEVELGEARBOX Dr. S. Ravikumar, N.Sharik, Dr. V. Muralidharan, C.Chandraprkash	18
31	COMPLEX NETWORK BASED FOURIER ANALYSIS FOR SIGNAL PROCESSING V Vijesh, K Satheesh Kumar, M S Swapna, and S Sankararaman	19
32	DETECTION OF UROLITHIASIS USING IMAGE PROCESSING TECHNIQUES Fathimath Fayiza, Amita Dessai	19
33	SMART SAFETY DEVICE FOR SEWAGE WORKERS Manish R Thingalaya, Anoop U V Bhat, Naveenkumar S R, Nikhil, Jeevitha S	20
34	COMPARISON OF CRYPTOGRAPHIC ALGORITHMS FOR WIRELESS UNDERGROUND SENSOR NETWORKS SECURITY Tanveer Kaur, Simarpreet Kaur	20
35	EXTRACTION OF CHITOSAN BY BIOPROCESSING OF SHRIMP SHELL WASTE AND PRODUCTION OF EDIBLE FILM Nageswara Rao Lakkimsetty, Karunya S, Kavitha G, and Shravanya Gundu	21

36	STUDY ON REDUCING THE BASE SEDIMENT AND WATER IN CRUDE OIL SEPARATION Nageswara Rao Lakkimsetty, Karunya S, Kavitha G, and Feroz Shaik	22
37	MARKOV CHAIN APPROACH TO RECTIFIER CIRCUITS V Vijesh, K Satheesh Kumar, M S Swapna, and S Sankararaman	23
38	DEVELOPMENT OF ELECTRONICS SPECKLE INTERFEROMETRIC WEIGHT SENSOR V. Aswathy Gopal, Abin Oscar, M S Swapna and S Sankararaman	24
39	KERF ANALYSIS AND MATERIAL REMOVAL RATE DURING ABRASIVE WATER JET MACHINING OF GFRP LAMINATES Chetan, N. Rajesh Mathivanan	24
40	NOVEL APPROACH TO FISH CLASSIFICATION: FRACTALYSIS AND MACHINE LEARNING BASED APPROACH Jothy Thampy, M S Swapna, and S Sankararaman	24
41	COMPARATIVE ANALYSIS OF MICROSTRUCTURAL AND MECHANICAL PROPERTIES OF MAGNESIUM FORGED WITH CAST COMPONENTS Jay Shah, Shailendra P Shisode	26
42	DESIGN AND KINEMATIC ANALYSIS OF SPOT WELDING ROBOT Ramanathan S, Dr. N. Mani, Devaneshwar B, Amarthian Kb,	26
43	METHODICAL ASSESSMENT & TRUTH FLOW ANALYSIS OF WIND TUNNELS Jyothi NT, H Ganesan, JV MurugalalJeyan	27
44	SYNTHESIS OF ECO-FRIENDLY BIO-DETERGENT TO REDUCE THE IMPACT OF CHEMICAL DETERGENTS Harsha R, Prasanna Venkatesh Reddy, Soumya, Karan P, Dr.Narendra S, Dr. Raviraj kusanur, Dr.Lingayya Hiremath	27
45	DESIGN AND FABRICATION OF FURNACE TRACKER (THERMAL BARRIER COATINGS) Sanjeev S M, Shivakumar R. Hiremath	28
46	RESTRAINED GEODETIC DOMINATION IN THE POWER OF A GRAPH John Joy Mulloor, V. Sangeetha	29
47	DESIGN AND ANALYSIS OF HYBRID ADDER USING ASYNCHRONOUS FINE - GRAIN POWER-GATED LOGIC WITH AND WITHOUT PARTIAL CHARGE REUSEs A.Anjaline Jayapraba, Dhandapani Samiappan	29

48	CFD ANALYSIS ON REGENERATION OF ROCKET NOZZLE DESIGN Asvidha P, Deepika R, Thanikaivel Murugan D	30
49	MELTING HEAT TRANSFER AND MHD BOUNDARY LAYER FLUID FLOW OVER A MOVING SURFACE WITH RADIATION EFFECTS B Shashidar Reddy, K Saritha	30
50	INTELLIGENT SYSTEM FOR DETECTION AND CLASSIFICATION OF DIABETIC RETINOPATHY Anila V R, Kala M T^	31
51	EXPERIMENTAL AND COMPUTATIONAL INVESTIGATION OF LOW REYNOLDS NUMBER AERODYNAMIC CHARACTERISTICS OF FIXED WING RELEVANT TO MICRO AIR VEHICLE (MAVs) S.Karthikeyan, G.Bharath Ajay, N.Raakin Ahamed, A.Sharun	32
52	COMPARATIVE ANALYSIS OF CFD TURBULENCE MODEL FOR A SUPERSONIC NOZZLE AT DIFFERENT CONICAL ANGLE M.Ajith, M.Kannivel, P.Yogesshwaran, S.Yokeshwaran	33
53	COMPUTATIONAL AND EXPERIMENTAL INVESTIGATION OF AERODYNAMIC CHARACTERISTICS OF BIOLOGICALLY INSPIRED FLAPPING WINGS S. Karthikeyan, Ahmed Dulvi, R. Raghavi, S. Sai Suresh	34
54	STABILITY IMPROVEMENT IN WATER: MICRO NANOBUBBLES TECHNOLOGY G.Senthilkumar, P.Krishna Sai Vikranth, B.Jeevan Kumar, Ch.Tarun Teja	34
55	BLOCK CHAIN BASED PREDICTIVE MAINTENANCE FRAMEWORK FOR INDUSTRY 4.0 Sharanya S, Prakash M, Senthilkumar J	35
56	CFD ANALYSIS ON EFFECT OF HEAT EXCHANGER OF BIO INSPIRED HEAT EXCHANGERS Dr. M. Arul Prakash, P V Surya, S Sakthi Aravindan, N Praneethan, S Prasanna Venkatesh	36
57	SPATIAL VARIATIONS IN PARTICULATE MATTER AND GASEOUS POLLUTANTS IN GREATER NOIDA Naresh Kumar, Suman	36
58	FASTEST DATA TRANSMISSION USING PSO ALGORITHM Dr. P. Sathiyamurthi, P. Sendhuvarthani, J. Jeyapratha	37

59	AN OPTIMIZED FEATURE DESCRIPTOR BASED CNN ARCHITECTURE FOR HUMAN ACTIVITY RECOGNITION USING IMAGE PROCESSING Nitin Bhatia	37
60	VIEW: RETROFITTING TECHNIQUES OF SEISMIC DEFICIENT BEAM-COLUMN JOINT Aniket Bhoskar, Prof. V. R. Harne	38
61	ENHANCEMENT OF BONDING STRENGTH OF AISI 304 STEEL ALLOY USING LASER SURFACE TEXTURING Prakash Ranjan, Venkadeswaran K, Shivaprasad Naidu, Rohan R	39
62	EFFECT OF FAILURE MODE CAUSING IN AEROSPACE MANUFACTURING INDUSTRIES AND ITS APPLICATIONS: CONCEPTUAL APPROACH Yash Desmukh, Ankit Kumar Mishra, Shreya Mane, Rishab Gupta	39
63	AN EXPERIMENTAL STUDY ON THERMAL CONDUCTIVITY OF MGO USING INSULATING POWDER TECHNIQUE Sheetal Prajapati, Shreya Mane, Janani Kavi Priya VS, Ankit Kumar Mishra	40
64	PRIVACY PRESERVATION OF EHR USING BLOCKCHAIN Saunthos K Muneer, George Mattew	40
65	THERMOHYDRAULIC TRANSPORT CHARACTERISTICS IN OBSTRUCTED MICROCHANNEL WITH/WITHOUT PULSATING FLOW CONDITION AT INLET Tapas Kumar Nandi, Gourav Kumar Chowdhury	41
66	DESIGN AND FABRICATION OF TRIARM COAXIAL HEXACOPTER Allwynprince A, Bhuvanesh S, Rajesh M, Varun kumar V	42
67	EPOXY MODIFIED MICRO CONCRETE – A REVIEW Rajendra G Hegde, Dr. K G Guptha, Shashanka Kanekar	42
68	EXTRACTION OF TERPENES FROM HERBS USING DEEP EUTECTIC SOLVENTS K Divya Shree, Nishaa V, Pravin Kanna S V,Dr.Pushpa Agarwal,	43
69	FORECASTING ENERGY DEMAND DUE TO ELECTRIC VEHICLE GROWTH AND HOW SOLAR POWERD MICROGRID CAN HELP Vipin Raj R., Rohit R.V, and K. Satheesh Kumar	44
70	PERFORMANCE ANALYSIS OF GLOBAL EXCHANGE TRADED FUNDS IN INDIA Nindu Priya Laxmi S B N, Asok Kumar N	45

71	ESTIMATION OF STATE OF CHARGE AND STATE OF HEALTH OF BATTERIES USING HYBRID METHOD AND RECURRENT NEURAL NETWORK Rohit Kumar Sharma, D.Sattianadan, S.George Fernandez	45
72	TRIBOLOGICAL STUDIES ON THE LUBRICATION PROPERTIES OF JOURNAL BEARING Arjun Sikka, Nitin Sharma	46
73	EFFICIENT FPGA ARCHITECTURE DESIGN AND ANALYSIS OF LMS ADAPTIVE FILTER Denna Joy	46
74	ANOMALOUS EVENT DETECTION FROM VIDEOS USING 3D CONVOLUTIONAL NETWORKS Shanija P S	47
75	DESIGN AND DEVELOPMENT OF SMART DUSTBIN USING IOT Arindam Ghosh, Debajyoti Sarkar, Aditya Kumar Jha, Sayan Das	48
76	COMPREHENSIVE EVALUATION OF PROPERTIES OF SANDS IN AND AROUND GOA Saeel Naik Chopdekar, K. G. Guptha	48
77	HYBRID VERTICAL AXIS WIND TURBINE FOR EV CHARGING AND HIGHWAY LIGHTING Rohit R V, Vipin Raj R, K Satheesh Kumar	49
78	INFRARED AND VISIBLE LIGHT IMAGE: ENHANCEMENT AND FUSION USING ADVERSARIAL NETWORK Niloofir Sulthana N T, Shibily Joseph	50
79	STRUCTURAL PERFORMANCE OF CONCRETE BEAMS WITH HYBRID REINFORCEMENT IN FLEXURE AND SHEAR Nazim N, Dr. Bharati Raj	50
80	A REVIEW ON VIRTUAL LEARNING PLATFORM FOR STUDENTS Bharath Shiruru, Kirana, Deependra Hebbar K, Roshanya S	51
81	REAL TIME IOT ENABLED AUTOMATED PLANT DISEASE DETECTION USING DEEP LEARNING MODELS – A REVIEW Anju U V, Dr. Swaraj K P	51
82	AN OPTIMAL SUPPLY POLICY FOR TIME DEPENDING DEMAND AND DETERIORATION WITH PARTIAL EXPONENTIAL BACKLOGGING Ragini Arora, Sangeeta Gupta, Sweta Srivastav	52

83	A SURVEY ON CREDIT CARD FRAUD DETECTION TECHNIQUES USING MACHINE LEARNING Varsha R Jenni	53
84	DESIGN AND ANALYSIS OF MODIFIED FIR FILTER FOR SIGNAL PROCESSING APPLICATION S.CatherinePriya, A.Anjaline Jayapraba	53
85	DETECTION OF AUTISM SPECTRUM DISORDER IN CHILDREN Sneha Joseph, Prof. Rahamathulla K	54
86	HETEROGENEOUS FACE RECOGNITION FOR NEAR INFRARED TO VISIBLE IMAGES USING GENERATIVE ADVERSARIAL NETWORKS: A REVIEW AthiraT.M., Shibily Joseph	54
87	SOCIAL DISTANCING VIOLATION DETECTION AND REAL-TIME AUTOMATIC FACE MASK DETECTION SYSTEM Silpa T, Dr. Vipin Kumar K S	55
88	BIODIESEL PERFORMANCE AND EMISSION STUDY USING NANO SIZED PARTICLE AS ADDITIVE: A REVIEW Md Barkat Ansari, Rajan Kumar, Manoj Kr. Mishra, Manish kr. Roy	56
89	STRESS PREDICTION USING HRV INFORMATION FROM SMART WEARABLE DEVICES THROUGH FEDERATED LEARNING Abhishek V, Ajay James	57
90	REVIEW: SEISMIC PERFORMANCE IN HIGH RISE STRUCTURE WITH SHEAR WALL BOTH WITH AND WITHOUT AN OPENING Radhika Hande, Prof.V.R.Harne	57
91	ANALYSIS AND DETECTION SYSTEM OF ACCIDENT USING THE SURVEILLANCE CAMERAS Jisa Shaji, Dileesh ED	58
92	INTRUSION DETECTION SYSTEM USING MACHINE LEARNING FOR SDN ENVIRONMENT Jishiya P A, Prof. Swaraj K P	59
93	PARKINSON'S DISEASE DETECTION USING FEDERATED LEARNING Akshaya Anand, Bisna N D	59

94	FRUIT YIELD ESTIMATION AND FORECASTING FOR PRECISION AGRICULTURE Anju Ashokan, Ali Akbar N	60
95	ANALYSIS OF ANTI-LOCK BRAKING SYSTEM OF AN AUTOMOBILE USING MATLAB SIMULINK Mr. Rachit Raj, Mr. Devansh Singh, Mr. Prithvi C	61
96	RSM AND FEM BASED TEMPERATURE AND BEND ANGLE PREDICTION FOR LASER FORMING OF AL2024 Shivaprasad Naidu. Y, Venkadeshwaran K	61
97	CHAOTIC TIME SERIES FORECAST BASED ON INDUCED MARKOVIAN NETWORK Reshmi L. B, M. C. Mallika, V. Vijesh, K. Satheesh Kumar	62
98	INDUSTRIAL INTERNET OF THINGS (IIoT) FOR DETECTING THE FAULT IN MACHINERIES USING THRESHOLD VALUES Mrs. K. Nithya, Dr.R.Nithya	62
99	MODELLING AND SIMULATION ON MECHANICAL BEHAVIOUR OF ALUMINIUM HYBRID COMPOSITES Pankaj Kumar, N. K. Singh	63
100	DESIGN AND OPTIMIZATION OF LIGHTWEIGHT CONNECTING ROD FOR 4-STROKE DIESEL ENGINE USING ANSYS Amin Ahmad, N. K. Singh	64
101	PORTFOLIO SELECTION USING LINEAR PROGRAMMING Sangeeta Gupta, Sweta Srivastav	65
102	ASSESSMENT OF GREEN RATING OF A BUILT ENVIRONMENT – A SUSTAINABLE APPROACH Aashma Upreti, Akeel Rashid, Ayush Dahal, Michana Theeng Lama , Bharathi Ganesh	65
103	QUALITY RESTORATION OF UNDERWATER IMAGES AND THEIR ENHANCEMENT WITH WHITE BALANCE AND HISTOGRAM EQUALIZATION Akhila V A	66

104	INVESTIGATING THE LINK BETWEEN DERIVATIVE MARKETS AND ECONOMIC DEVELOPMENT Suryalekshmi S, Dr. Vinod M	67
105	DESIGN AND ANALYSIS OF THREE-PHASE UPQC UNDER STEADY-STATE AND DYNAMIC-STATE CONDITIONS Kousar Jan[1] and Geeta Pathak	67
106	SIMULATION OF CEMENT MORTAR AND CONCRETE PROPERTIES USING VCCTL AND THEIR EXPERIMENTAL VALIDATION. Shraddha Chakurkar (Anawkar), Dr. K.G. Guptha	68
107	A NOVEL ADDITIVE TO MAKE OPTIMISED MIXES IN RMC INDUSTRY Kowshika V.R, VijayaBhaskaran, Ram Kumar NataRajan, Bharathi Ganesh	69
108	SECURE CLOUD STORAGE WITH BLOCKCHAIN TECHNOLOGY USING MULTI-KEY AGGREGATION ALGORITHM D.Nagamany Abirami, Dr.M.S.Anbarasi	70
109	PERFORMANCE OF SINGLE PHASE DVR USING CONVENTIONAL PI AND ANN CONTROLLERS Tannu, Geeta Pathak	71
110	COMPUTATIONAL IMPLEMENTATION OF L-HISTIDINE BASED MOLECULAR DEVICES AS LOGIC GATES Gaurav Sikri, Ravinder Singh Sawhney	71
111	IMPORTANT OF BIODIESEL AND IT'S CHALLENGES IN CI ENGINE Bijay Narayan Mohanty, A Layek	72
112	PRIVACY-PRESERVING DATA PUBLISHING MODELS, CHALLENGES, APPLICATIONS AND ISSUES Jayapradha. J, Prakash M , Third Author	73
113	FEASIBILITY STUDY OF USING C&D WASTE FOR RIGID PAVEMENT CONCRETE Pruthvi M, Pavan P, Ruthik S, Shashank C R, Jayesh S, Bharathi Ganesh	73
114	FABRICATION OF MULTI-CONFIGURATION UNMANNED AERIAL VEHICLE Pradeep Krishnamurthy Vijayalakshmi, Ramu K N, Ravinder J , Kaviyarasu E, Prem Sundar R	74

115	ANALYSIS OF TURBULENT FLUID FLOW THROUGH A RECTANGULAR DUCT BY VARYING THE HEIGHT OF THE BAFFLES ATTACHED AT THE LOWER WALL Dr. Debajit Saha, Aditya Prakash Ghosh, Anand Prasad, Anil Kumar Prajapati	75
116	EFFECT OF FIBERS ON RHEOLOGICAL PROPERTIES OF SELF COMPACTING CONCRETE - AN INVESTIGATIONAL STUDY Vinayaka R Prabhu, Nitin A V , Bharathi Ganesh, Mohamed Ibrahim N	76
117	THE OUTBREAK OF COVID-19 AND ITS IMPACT ON STOCK PRICES Harishma P Mohandas, Dr. Vineetha S Das	76
118	OCCLUSION RESILIENT OBJECT DETECTION UNDER VARIOUS SITUATIONS USING DEEP LEARNING TECHNIQUES: REVIEW SREELAKSHMI P R, Dr.Swaraj K P	77
119	INFLUENCE OF DIAMETER AND COPPER BARS ON INTERFERENCE FIT OF HIGH-SPEED SPINDLE Vijay Irappa Biradar, Rajesh N Mathivanan , Pramod Kumar	77
120	ANALYSIS OF LEAN IMPLEMENTATION AND PRACTICES IN SME'S USING VSM OF THE PAPER T Pravinprabu, S J Rajarajan, P Kannan, T Jayakumar	78
121	PREDICTION OF HOUSE PRICE INDEX USING MACHINE LEARNING TECHNIQUES Nayana Das, Prof. Asok Kumar N.	79
122	CREDIT RISK PREDICTION USING DECISION TREE AND NAÏVE BAYES ALGORITHM Aswathy B Binu, Vineetha S Das	80
123	RECENT TRENDS IN FABRICATION OF PARTS USING FUSED DEPOSITION MODELING (FDM) – A REVIEW Srinivasan D, Sevvel P and Tanushkumaar P	80
124	LATEST DEVELOPMENTS IN MECHANISMS AND METHODS FOR FABRICATION OF PARTS USING LASER DIRECTED ENERGY DEPOSITION (LDED) – A REVIEW Purushothaman , Sevvel P and Tanushkumaar P	81
125	ENHANCEMENT OF THE PROPERTIES OF EPDM/NBR ELASTOMERS USING NANOSILICA FOR SEAL APPLICATIONS K Parthasarathy, S Vishvanathperumal, T Balasubramanian	82

126	CONDITION EVALUATION OF STEEL STRUCTURE BY VARIOUS NDT METHODS FOR REUSE Atharva Mahore, Prakash Patil, Dilip Mase	83
127	ON THE POTENTIAL OF ORGANOCLAY WITH RESPECT TO CONVENTIONAL FILLERS (CARBON BLACK AND SILICA) FOR EPOXIDIZED NATURAL RUBBER COMPATIBILIZED NATURAL RUBBER/ETHYLENE-PROPYLENE-DIENE MONOMER (NR/EPDM) VULCANIZATES Manimaran K, Vishvanathperumal S	83
128	EXPERIMENTAL INVESTIGATIONS ON RESISTANCE SPOT WELDING PROCESS DURING JOINING OF E34 SS4012A GRADE LOW ALLOY STEEL Himanshu Krishna Rai, Maneesh Tewari, Sandeep Kumar, Arun Kumar Chaudhary	84
129	TO INVESTIGATE THE PERFORMANCE OF MOLECULAR (BUOYANCY) SEAL IN FLARE SYSTEM Shubham Bhadarge, Ganesh Shrigandhi,	85
130	SD-DIVISIBILITY AND SOME RESULTS ON SD-DIVISOR LABELING OF GRAPHS K. Kasthuri, K. Karuppasamy, K. Nagarajan	85
131	AN EFFICIENT SYSTEM FOR WORMHOLE ATTACK DETECTION IN MANETs Nimisha C.J, Dr. Geetha G	86
132	BIG DATA AND CLOUD ENABLED GLOBALLY CONNECTED HOSPITALS WITH DISEASE PREDICTION USING MACHINE LEARNING Fathima N B, Dr. Sujith Kumar P S, Nurjahan V A	87
133	A REVIEW ON CLOUD COMPUTING SECURITY CHALLENGES, ATTACKS AND ITS COUNTERMEASURES ArunkumarM, Dr. K. Ashokkumar	87
134	EFFECT OF SILICA FUME ON RHEOLOGICAL, MECHANICAL AND DURABILITY PROPERTIES OF GROUND GRANULATED BLAST FURNACE SLAG BASED-GEOPOLYMER CONCRETE Suresh Kumar A, Dhanush P, Sai Sri Karthikeya S, Sai Kiran A, Rajasekhar Reddy V and Ravi Teja G	88

135	UTILIZATION OF SILICA FUME FOR THE PRODUCTION OF SELF COMPACTING GGBS BASED GEOPOLYMER CONCRETE Arunkumar K, Sureshkumar A, Mohan murali M, Gowtham lohith B, Aruna Jyothi B, Sravani B	88
136	BEHAVIORAL CHANGES OF NON-EXPANSIVE SOIL EXPOSED TO ALKALI CONTAMINATION Padam Siva Kumar, Sai Kumar Vindula, G. Banupriya, Neelam Venkata Sai, Gajjela Triveni, Bandela Sandeep Kumar, PinjariDasthagiri Basha	89
137	AN EXPERIMENTAL INVESTIGATION OF DUST BUILDUP ON SOLAR PHOTOVOLTAIC MODULES G. Banupriya, Parthiban Loganathan, Padam Siva Kumar, J. Rajasekar, G. Sindhu, M. Rajendra Prasad, P. Swetha, M. Rakesh Kumar Reddy, C. Jaya Sriniketh	90
138	EXPERIMENTAL INVESTIGATION ON STRENGTH CHARACTERISTICS OF AN RCC BEAM USING SILICA SAND V. Prem Kumar, Arunkumar Kadarkarai, A. Suresh Kumar, S.N. Mohan, V. Akbar, T. Sainath Reddy, Y. Sugunakar Reddy	91
139	ENHANCEMENT OF PROPERTIES OF CONCRETE USING COCONUT FIBRE AND COCONUT FIBRE ASH V. Prem Kumar, P. Manikandan P. Prathyusha, R. Uday Kiran , B. Seshu Pavan Yadav, A. Mohammed Zahid, A. DhanuSree.	91
140	DESIGN AND INVESTIGATION OF AUTOMATIC PEST DETECTION AND PESTICIDE SPRAYING DEVICE Kalyan Pichumani, S Ramanathan, I.Vimal Kannan, S. Rohith krishnan, M.Mukhunth & N.B.Santhosh Krishna	92
141	INNOVATIVE TRAINGULAR TREND ANALYSIS OF MAXIMUM DAILY TREAMFLOW AT THE GAUGING SITES OF GODAVARI BASIN D. Srinivasa Murthy, Parthiban. L, Danush.P, M. Mohan Murali, B. Vamsi Krishna, B. Gowtham Lohith	93
142	A QUALITATIVE STUDY AND ANALYSIS OF CLAIM PROBLEMS IN INDIAN CONSTRUCTION INDUSTRY Mukilan K, Chithambar Ganesh A, Suresh Kumar A, Velumani P, Arunkumar K, Chandra Devi R,	94
143	DETECTION OF PHISHING WEBSITES BY USING MACHINE LEARNING BASED- URL ANALYSIS Bismi Hameed, Arun Kumar M, Dr. Abdul Gafur M	94

144	EFFICIENCY OF LIFE DEXTERITY COMPONENT TO COVENANT WITH DEJECTION AMONG WORKING WOMEN Deepthi M, J V Muruga Lal Jeyan	95
145	COMPREHENSIVE EXAMINATION AND VALUE INVESTIGATION OF PREFERRED MILLETS FOR THE CIRCUMSTANCE STUDY INVENTION Anu John B, Bhavin Kumar, J V Muruga Lal Jeyan	95
146	FORWARD FLIGHT PERFORMANCE OF COAXIAL MINI UNMANNED AERIAL VEHICLE (UAV) FOR APPLICATIONS IN MOUNTAIN TERRAIN P.S. Ramesh, J. V. Muruga Lal Jeyan	96

TECHNO-ECONOMIC ANALYSIS AND OPTIMIZATION OF SOLAR AND WIND ENERGY SYSTEMS FOR POWER GENERATION AND HYDROGEN PRODUCTION IN OMAN

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Abstract:

Hydrogen generation utilizing renewable energy is becoming a critical pillar for the future development of the global sustainable energy sector. The Sultanate of Oman is currently integrating renewable energy sources, with solar photovoltaic (PV) systems and wind energy accounting for a substantial portion of the total. The Sultanate's solar and wind potential can help boost energy security and contribute to developing a sustainable energy industry that benefits not just the country but also the international community. Many studies and practical experiences have been conducted. This research aims to look into the potential for power generation and hydrogen manufacturing in Oman using solar and wind energy resources. The research also covered several optimization methodologies for comparing the energy production cost and performance of various hybrid system configurations using simulation HOMER software. A detailed techno-economic analysis of wind and solar energy use has been presented. The solar energy potential was first analyzed, with the majority of the field having a high radiation intensity of more than 2,200 kWh/m^2. Marmul, Fahud, Sohar, and QairoonHairiti receive the most significant sun radiation in Oman. Second, wind resources were investigated, which revealed a high-power density of 3.0 to 6.3 m/s for 28 different locations in Oman. The results show that integration of 80.8 kW PV array,62 wind turbines, 20.5 kW converter & 133 batteries storage bank is the best configuration that leads to the minimum levelized cost of energy (COE) of 0.708 $/kWh at Salalah area and the cost of hydrogen production (COH) is 10.2 $/kg.

Keywords: Hydrogen generation, solar photovoltaic system, Optimization, Wind and solar energy.

THREAT DETECTION IN IOT LAYERS USING ML TECHNIQUES

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Abstract:

The Internet of Things (IoT) is a rapidly evolving technology. Interrelated devices and sensors transmitted data via the network to resolve issues and provide additional services. Hospital treatment, remote control of equipment, and M2M contact, among other services, are provided to users without the involvement of humans. It increases the availability of Internet-connected devices in our daily lives, bringing with several benefits as well as security risks. There are a various of ML approaches that can be utilised to protect IoT from various types of threats. Machine Learning (ML) methods are used to generate precise outputs from huge complex data, which can then be utilised to predict and identify risks in IoT network. This chapter, carried out a comparative review of previous researches and studies on attack identification using Machine language techniques. The objective of this work is to give a systematic study of ML techniques that can be utilized to create upgraded attack detection models for IoT frameworks.

Keywords: Attack, IOT Layers, Protocols, ML Techniques.

ANALYSIS OF FOUR SPAN CONTINUOUS BEAM BY USING PYTHON

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Abstract:

There are innumerable methods for solving continuous beams, including the slope and deflection method, the moment distribution method, the flexibility matrix method, and the stiffness matrix method. Each method has its own identity. The final results of all four methods are shear force, bending moment, slope, and deflection. Even if all approaches yield the same result. The issue now is the time duration of those methods. One assessment should take approximately over thirty minutes to complete. Another issue is that the entire analysis will be repeated even if only one parameter is changed. Computer-based analysis is the best solution to all of these problems. Python is a computer programming language that has recently gained popularity due to its syntax

simplicity. The code can be executed as soon as it is written in this case. A four span continuous beam will be analyzed using Python in this paper, and the results will be compared to the conventional stiffness method. Initially, inputs are sent to Python using finite element procedures. The analysis is performed with Numpy, and the results are printed. Numpy is a Python library that is capable of performing all mathematical analysis, particularly on arrays and matrices. The analysis in this paper is carried out using Google colab as a plot form and Numpy as a tool.

Keywords: Moment distribution method, computer-based analysis, Python programming, Numpy.

EMERGING DEMANDS IN INTRUSION DETECTION SYSTEMS FOR SECURE COMMUNICATIONS

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Abstract:

The Global increase of internet users enabled numerous devices to be connected with the common network. Cloud Computing (CC) enhancing every part of human life on education, security, healthcare, entertainment, business automation. Due to heterogeneity, scalability and Quality Of Service (QoS) the requirements varies. On the other hand, significant amount of security perspectives also increases. Due to enormous loss on devices data along with credential information, a robust detection system for network intrusion is important. The proposed study is undertaken to have a multiple perspectives of security issues and levels of demands for Intrusion Detection System (IDS) for mitigating security attacks. The study focused on various demands and relevant solutions related to the intrusion detection system in Cloud networks. Consideration of various existing frameworks On machine learning, deep learning, neural networks, Data Analytics and malware detection frameworks the perspective of proposed study is motivated to give a solution that enhance the future research implementation with existing results.

Keywords: Intrusion detection system, Anomaly detection, Malware detection, Secure communication, Cloud Computing.

SIMULATION OF SEMICIRCLE UWB PATCH ANTENNA WITH DGS FOR SATELLITE APPLICATIONS

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Abstract:

In this paper, a semicircle UWB Patch antenna with defected ground structure using HFSS simulation are presented. In February, 2002 the FCC amended the part 15 rules which govern unlicensed radio devices to include the operation of UWB devices. The FCC also allocated a bandwidth of 7.5 GHz, i.e., from 3.1GHz to 10.6GHz to UWB applications, by far the largest spectrum allocation for unlicensed use the fcc has ever granted. The semi-circular patch antenna is designed on a FR4 substrate with dielectric constant εr = 4.4 and height of the substrate is 1.6mm. Several antenna characteristics such as return loss, VSWR, radiation pattern, bandwidth, directivity, antenna gain, radiation pattern are studied. The simulated result shows return loss value well below -10 dB and a percentage bandwidth equal to 105% is achieved. Also, a good directivity value of 1.9 dBi and antenna gain equal to 2 dB is observed. Since the Semi-circular microstrip patch antenna is designed at X band satellite receiver communication applications.

Keywords: UWB antenna, DGS, FCC, CPW and HFSS.

IOT BASED SMART METERING SYSTEM

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Abstract:

The emerging IoT concept recently in our lives, has offered the chance to establish energy efficient smart devices, systems and cities. Due to the urgent need for conserving energy, this paper proposes an IoT based energy efficient wireless smart metering system design. It competes with the existing meters as being a low cost completely integrated metering system. It offers an ease for the users in the form of a database for the electricity supplier company. The proposed system design has an accuracy level of 97% and it is about 25% lower cost than its peer in the global market. The proposed design reduced the power consumption by 16%**.**

Keywords: Metering system; prepaid; IOT; energy efficiency; smart cities.

ANALYZING THE CLIMATE RESPONSIVE DESIGN STRATEGIES OF TRADITIONAL HOUSES IN THE HOUSING SETTLEMENTS AROUND KAYAROGESHWARAR TEMPLE AND ITS IMPACT OF URBANISATION IN NAGAPATTINAM TOWN, INDIA

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Abstract:

Traditional architecture is the substance of native builders who do not qualify by degrees, but who are special builders for their area by analysing local materials and knowing local environment needs through their ancestral knowledge. Their ancestral construction method and technologies employed by them are unique to the area and ideal for the context that solves both their fundamental needs and our most current problems such as energy concern, conservation and cost-effective development. Tamil Nadu has too many architectural marvels, one of which is the central settlement of Nagapattinam, the north, south, east and west streets around the temple of Kayarogeshwarar. This study uses questionnaire survey among occupants to evaluate traditional architectural design elements, while Mahoney table and Olgyay's Bioclimatic charts are evaluated to assess the current status of residences with their indoor environmental comfort (both traditional and contemporary).The findings of this study show that traditional buildings around the temple complex are slowly disappearing due to demographic changes and rapid urbanization, but these buildings are still excellent examples of better indoor environmental comfort performance, as well as an outstanding model for its aesthetic character that symbolizes the uniqueness of the region. By implementing uni-directional wind catchers, courtyards and foyers at both ends of the properly oriented dwellings, all contemporary buildings in a conservative way allow a better building design with less energy usage.

Keywords: Climate responsive architecture; Coastal region; Contemporary; energy-efficient vernacular Architecture.

INFLUENCE OF GREEN HRM ON SUSTAINABLE DEVELOPMENT

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Abstract:

Green development through the domain has carried out the knowledge of Green HRM (Green Human Resource Management), which supports in sustainable development. Sustainable

development has now turned out to be requirement of the period. Today's establishments have to stay aware and flexible to unexpected incidents, such as outward crises, which generate enlarged indecision between their staff and carriage instant dangers to the institutions' accomplishment and feasibility. However, with the current situation, institutions abruptly have to negotiate the exceptional and thereby discover fresh resolutions to provocation rising through many parts of their actions. The outstanding provocation in the present day is different, including a series of composite problems such as weather change, severe economic downward spiral and governmental uncertainty. This review offers a complete collected works analysis of Green HRM practices and put forward the implementation of supportable and environmentally friendly approaches by HRM sections in system of government in the form of Green HRM. A widespread collected works analysis was accepted out to collect perceptions on widespread Green human resource actions and their connection with sustainable institutional development. This study places attentiveness rank of Green human resource approaches like eco-friendly exercise, green recruitment, performance appraisal, worker participation and reward. The discoveries recommend that there is additional opportunity to apply the widespread potential of Green Human resource Management approaches for stimulating environmentally safe enactment in the institutions. Trainings like this are more significant in emerging countries, which have shocking ecological apprehensions and sick executed government regulations.

Keywords **:** Green HRM, Green HRM practices, Sustainable development.

AN INTELLIGENT SYSTEM FOR IDENTIFYING THE RISK OF COVID-19 USING LOGISTIC REGRESSION

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Abstract:

SARS-CoV-2, also known as Covid-19 Corona Virus, caused damage worldwide, and the situation is getting worse. Every day, it is an epidemic disease from one person to another. Therefore, it is important to keep track of the number of patients involved. The current system provides computer data in an integrated way that is very difficult to analyze and predict the growth of disease locally and globally. To overcome this difficulty, Machine learning algorithms can be used effectively to map out the disease as well as continue to solve this problem. By analyzing X-ray images of the patient's chest, machine learning, which is part of computer science, is important in classifying patients appropriately about illness. Supervised machine learning models with support algorithms (e.g. LR, SVR, and Time-series algorithms) for data

analysis to back up classification helps model training to predict total global value confirmed cases or who will be at risk of contracting the disease in the coming days. Total Global data collection is being processed, pre-processed, and the number of verified cases has arrived at a specific date is issued, which is used as a model-set training in this regard proposed work. Supervised machine learning algorithms are used for training a model for predicting the growth of cases in the coming days. In this paper, we have proposed a method to identify whether a patient has a risk of covid-19 using a machine learning framework-logistic regression model, considering multiple symptoms and, also developed a web page that displays the attributes, and sample records, graphs related to the at risk-patients of covid-19.

Keywords: Logistic Regression, Covid-19, Machine Learning.

DIGITIZATION OF PRODUCT QUALITY IN MANUFACTURING

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Abstract:

It is browse based application that can be accessed from anywhere via the internet. The main purpose of this project is to digitize and automate and manufacturing process by putting quality checks in each phase of development. The digital solution mainly works on strengthening and quality assurance process by adapting new and intuitive solution under umbrella of Industry 4.0. Real time quality management is one such solution conceptualized and developed together by Toyota and Bosch for assisting work force on assembly shop floors. The Engineer did the job every stage in the site. After completed job then check the quality assurance of job process by the quality checker. Then the quality checker updates the status of the job process to the site supervisor. Real time quality helps quality inspectors to adhere 100% to predefined quality inspection elemental processes. It also helps in quickly resolving detected defects by following standardized work. Each phase of manufacturing quality gages will be there and it would be verified by higher authority team of engineers.

Keywords: Quality, Manufacturing, Digitization, Product

OCR: WORD TO TEXT CONVERTER

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Abstract:

Word recognition is an intelligent activity of a pattern recognition system. Sometimes the human brain is also confused to identify handwritten characters in a certain language. In an image of handwritten Marathi, Hindi compound characters, feature extraction techniques are playing a significant role to extract special features of the image. For handwritten characters, zoning is the most popular method to extract the features. The main aim of feature extraction is to extract the relevant information of an object or image. In this system, the zoning feature extraction technique is used to extract features. Besides this, the statistical feature extraction method is also proposed.

Keywords: word recognition, OCR, features, image, scan

BLOOD LEAKAGE DETECTION SYSTEM DURING HEMODIALYSIS

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Abstract:

Haemodialysis is a treatment for patients suffering from kidney disease or renal failure. This treatment helps the kidneys filter water and waste from the human body, which they normally do when they are healthy. Dialysis is a process that is performed on patients with kidney failure regularly to keep blood pressure in check and minerals like sodium, potassium, and calcium in balance. Currently available hemodialert products will only detect blood leakage during dialysis if there is a leakage of at least 100 mL. As a result, patients are at an extremely high risk of developing 'Uremia'. The proposed system is intended to detect blood leakage in as little as 1-2 seconds, requiring a sensing sensitivity of less than 1ml of blood. To detect blood leakage, a photo-interrupter is used as a sensor and is connected to Wi-Fi for wireless data transmission.

Keywords: Haemodialysis, Blood leakage detection, Photo interrupter, Internet ofThings

A COMPARATIVE STUDY OF INHERITANCE IN C++ AND JAVA

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Abstract:

For reusability and achieving run-time polymorphism, Inheritance is one of the most important features of object-oriented programming. Java and C++ both are object-oriented programming languages and support inheritance. However, their way of inheriting classes is different from each other in some aspects. This paper articulates, the comparison of inheritance in java and C++ on the basis of some parameters.

Keywords: Inheritance, C++, Java, derived class, base class.

VARIABLE ENERGY BLAST WAVES IN PRESENCE OF ELECTRIC FIELD

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Abstract:

In this paper, we have studied the propagation of shock waves in a gaseous medium in presence of electric field. The flow fields being spherical, cylindrical or planar, respectively. Salient differences between the instantaneous energy and the variable energy are also presented. After blast there is some sudden change occur due to shock wave propagated.The medium is also considered as dusty.

Keywords: **S**Blast waves, instantaneous energy, variable energy, azimuthal electric field.

DOMINATION NUMBER FOR SOME STAR RELATED GRAPHS

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Abstract:

Domination number of a graph is the total number of vertices in minimum dominating set. This paper explores the domination number for Star of fan graph. Star of Fan graph is formed by

adding a Fan graph at each vertex of $F_{p,q}$. Also, we developed an algorithm using python to find the domination number for *n* – star of Fan graph.

Keywords: Dominating set, Domination number, Star graph, Fan graph, Star of fan graph, Python programming.

COMPREHENSIVE ANALYSIS OF OPTIMAL APPORTIONMENT OF EV CHARGING STATION IN A RADIAL DISTRIBUTION SYSTEM

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Abstract:

Electric vehicles (EVs) are large loads and with the penetration of more EVs into the grid, they always can affect the power system network on a large scale. While investigating, the impact of EV is felt in the grid system from an electrical perspective (like voltage stability, losses, reliability). The project aims at finding a feasible solution for reducing the burden on the power system. The main areas of concern while integrating EVs into the system are power losses, utilization factors, voltage, and reliability. The extended view of the project is to implement renewable sources of energy in the form of distributed generation that can greatly help in reducing the impact of a large number of EV charging station (CS) loads on the grid. Hence this paper presents a comprehensive analysis using TLBO and Grey Wolf optimization algorithms for reducing power loss, and reliability while improving the utilization factor of the system. The method is tested in a standard IEEE 33 bus system using MATLAB. The results show a reduction in power loss and other parameters apart from which the system's voltage profile has been improved to a large extent.

Keywords: Power loss, Voltage stability, Reliability, Electric vehicle, Charging station.

INTERNET OF THINGS(IOT), ITS APPLICATIONS AND FUTURE DEPENDENCY: A REVIEW

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Abstract:

Internet of things is a technology that has become slang in today's world. Presently the situation is that world without internet cannot exist. So due to lots of its use there are coming more updated technologies to make our life more comfortable. The main aim of this review article is to

make the researchers guide through the path of Internet of Things. It will provide a comprehensive overview of this technology its further more updates, advantages, disadvantages and where it is being used presently. There are various types of fields where IOT can be implemented such as Robotics, Industry, Agriculture, Healthcare, Transportation, Smart sustainable cities and many more. In this review paper we discussed the above mentioned fields about its present state where it is being used and based on that we made some future predictions related to IOT.

Keywords: Internet of things (IOT), RFID, Smart, Automatic, Implemented, Precision, Sensors.

DEVELOPING LANGUAGE COMPETENCES OF STUDENTS THROUGH DIGITAL TECHNOLOGIES

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Abstract:

In the article the role and to study the peculiarities of functioning of English language in higher education is highlighted. The state of education of the Republic of Uzbekistan and trends of development of society are the most result problems of priority development of the education system on the basis of computer technology and the creation of a unified educational information environment. With the rapid development of science, fast updates of information, it is impossible to learn for a lifetime, it is important to develop the interest in obtaining knowledge for continuous self-education. The main objective of the training is to achieve a new modern quality of education.

Keywords: Technology, a foreign language environment, Second language learners, language competency

AERODYNAMIC PERFORMANCE OF NATURE INSPIRED FOILS IMPLEMENTING SLOTS

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Abstract:

The aim of this research is to present an airfoil with good aerodynamic properties. The airfoil is to be designed such that we can get a better stall and lift efficiency. The boundary layer separation over airfoil is the reason for stall. This stall affects the coefficient of lift for an airfoil by increasing drag. The boundary layer separation or flow separation is the point where the flow of fluid gets separated from the surface of airfoil. The Slot method can be implemented over the

airfoil to reduce the stall and drag resulting in increase of lift. This method is implemented on NACA series airfoil to reduce flow separation. The airfoil is designed using CATIA and analysis of airfoil is done by CFD using ANSYS FLUENT. The parameters like airfoil span is 300mm, chord length is 200mm. The setup is arranged such that the Angle of Attack is about 0^0, 5^0,10^0,15^0, $20^0$the Reynolds Number is about 3.18*105, Mach number ranging from 0.3 to 0.6.The results from ANSYS shows aerodynamic properties. This provides us the delaying the stall for longer angle of attack and to generate positive lift at higher angle of attacks.

Keywords: Aerodynamic characteristics.1, Stall delay2, Flow separation,3.

DELAYING THE FLOW SEPERATION BY USING PASSAGE AND VORTEX GENERATOR TECHNIQUES

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Abstract:

Flow separation is when the air flow gets detached from the surface of the object which was travelling through the flow. When there is a flow separation it results in drag and causes stalling. In order to overcome this flow separation, we use a vortex generator which produces small vortices and helps the air to be attached over the surface without getting separated. By studying using passage created and vortex generators, we can analyze flow separation delay over a surface. Area of discussion involve fluid dynamics and aerodynamics research. This review aims at explaining about the analysis of air flow over a surface with and without passage created and also vortex generators. The computational results are compared with experimental wind tunnel measurements with respect to lift and drag variation.

Keywords: Boundary-layer controls, Stall delay, Flow-reattachment.

ROS AND MOVEIT BASED 6 DOF MANIPULATOR

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Abstract:

In the modern society of 21st century Robotics has been increasingly popular, useful, and successful in the modern world. In a variety of human endeavors robotics has found applications in medical, education, the military, research, and, most notably, manufacturing. Especially manipulators are becoming the utmost important part in any big industries like automobile

industries where they are deployed to carry out many tasks repetitively which are very difficult or dangerous for humans. Depending on the number of degrees of freedom robotic arm can have a wide range of motion, depending on the creator's imagination also. These robot's base is generally fixed at one place. That base can be moving if it is attached to different mobile robot. Generally, for large assembly lines or work floors they are programmed to do repeating tasks depending on the work required and end effector attached**.**Here the authors are presenting about their self designed and developed low cost prototype of a 6 DOF manipulator controlled using ROS and Moveit based programs and packages which makes it easier to control because of clear and number of visualization features provided by it.

Keywords: 6 DoF, manipulator, ROS, RVIZ, URDF

DESIGN AND ANALYSIS OF DYNAMIC WIRELESS POWER TRANSFER FOR ELECTRIC VEHICLE CHARGING APPLICATION.

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Abstract:

The depletion of oil and the emission of greenhouse gases are getting attention worldwide. The transport sector is one of the major causes in producing greenhouse gases next to the industry sector. Electric Vehicles are a promising solution to minimize the negative impacts caused by conventional vehicles on the environment. However, problems associated with introducing EVs arise, such as inadequate charging facilities. The wireless charging system can make EVs more accessible. This mode of charging allows the battery to get charged from the power source without the electric cables and wires. This paper proposes the design and simulation of parallel-parallel configuration for the dynamic charging. ANSYS Maxwell software is used for design and simulation of the coil.The power transfer between the transmitter coils and receiver coil is tested by taking the parallel compensation. The system is simulated and demonstrated for 5cm air gap between the coils. The output waveforms has 18.9 kHz frequency. A DSO is used instead of multimeter as the work deals with high frequency. The DSO is used to measure output voltage across load and thus power transmitted was calculated. In this work, the misalignment between transmitter and receiver coils also improved.

Keywords- Wireless power transfer (WPT), Electric vehicle (EV), Magnetic resonance coupling (MRC), Heavy duty vehicle (HDV), Zero phase angle (ZPA), Coefficient of coupling (K), Quality factor (Q), Dynamic wireless charging (DWC)

PERFORMANCE AND DISTANCE ENHANCEMENT OF 160 GBPS ISOWC SYSTEM USING POLARIZATION DIVISION MULTIPLEXED 256-QAM

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Abstract:

For communication in space, information transmission lines are critical for reaching the whole world. A long delay and a poor data transfer rate has been observed in radio frequency (RF) communication. Intersatellite communication has become more common in recent years and optical wireless communication (IsOWC) has advanced dramatically in recent years. Owing to its multiple advantages, including as large channel bandwidth, high-speed connectivity, and inexpensive cost, IsOWC technology is becoming popular among researchers. Uniphase modulations such as Non return to zero modulation does not have efficient spectrum for high speed inter-satellite communication. 256-Quadrature amplitude modulation (QAM) with polarization division multiplexing (PDM-256-QAM) at 160 Gbps over IsOWC channel is demonstrated in this work using matched filter and Digital signal processing (DSP). Proposed system is investigated for PDM-256-QAM at 1550 nm wavelength and results analyzed in terms of Q factor, log symbol error rate (SER) and Error vector magnitude (EVM). Results reveal that 160 Gbps data is successfully transported over a distance of 22,000 kilometres with a bit error rate (BER) that is acceptable.

Keywords - QAM, IsOWC, DSP, Matched filter, BER

DESIGN, ANALYSIS AND TOPOLOGY OPTIMIZATION OF FLOATING DISC ROTOR

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Abstract:

In the present day, floating-disc brakes are widely used in two-wheeler racer bikes due to the structural and thermal load resistance it offers. However, the analysis and design approach of such types of brake rotor is missing in spite of being popular in the market. Hence, this project

aims to study the disc brake system, design both conventional and floating disc rotors with the help of Solidworks and perform static structural and steady state thermal analysis using Ansys to get the final result of topology optimization. This will provide a faster and efficient design approach of disc brakes. Finally, the results of the analysis of the two types of disc-brakes are compared to prove how the floating-disc brake is more efficient than the single-plate disc brake.

Keywords: Floating brake disc rotor, Solidworks, Ansys, Structural, Thermal analysis, Topology optimization

FABRICATION AND CHARACTERIZATION OF AZ31B NANOCOMPOSITES BY STIR CASTING PROCESS

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Abstract:

Magnesium is a biodegradable metallic biomaterial which is mostly used in human body as an implant for bone tissue engineering. The main advantages of biomaterials of Mg compounds are that it has very good biocompatibility, biodegradability and good mechanical properties. In orthopedic implementation biomaterials such as magnesium is mostly preferred because it has high degradation rate compared to other biomaterials used in biomedical field. In this experimentation work, an alloy of Mg was selected as main medium and nano-hydroxyapatite and nano alumina was selected as reinforcement. AZ31B is one of the financially accessible Mg composites, which is made out of two different alloying substances in particular aluminium and zinc. Nanocomposites of AZ31B with varying composition of nano hydroxyapatite and nano alumina were casted by stir casting process. Compression tests are mostly used to check the behaviour of the metals under an applied load. The utmost stress a metal can overcome over a time period under an applied load is checked. Compressive strength of human bone is 131 MPa and all the prepared samples have compressive strength greater than human bone. The dull dark districts in the Scanning Electron Microscopy (SEM) pictures at high amplification demonstrate the presence of porosity which is developed in all prepared samples of MMC nano composite because of the air bubbles formed during gravity casting of magnesium alloys in stir casting process.

Keywords: Magnesium, nanomaterial, biodegradable.

INDUSTRIAL REVOLUTIONS 1.0 TO 4.0: A JOURNEY TO SUSTAINABLE MANUFACTURING

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Abstract:

The world has seen four industrial revolutions till the modern time, starting from industry 1.0 to industry 4.0. These industrial revolutions have emerged the new dimensions of human life. It has affected socio-economic aspect of each country in very deep manner. It has developed new horizons in the manufacturing sector of leading economies of the world. But along with these industrial revolutions new challenges also have been emerged on the surface. This leads to concentrate on the concept of sustainable development during manufacturing which cares about mainly environmental issues, natural resources conservation and energy efficiency. This paper relates the concept of industrial revolutions 1.0 to 4.0, with the sustainability of manufacturing sector. In this paper an attempt has been made to find out the presence of attributes of sustainability in manufacturing sector with different industrial revolutions. And it is established that industry 4.0 gives highest level of sustainability in manufacturing sector among all industrial revolutions.

Keywords: Sustainability, Industrial revolutions, Industry 4.0, Manufacturing.

MODELING AND REAL TIME SIMULATION OF A DFIG-BASED WIND ENERGY CONVERSION SYSTEM

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Abstract:

The present research work deals with the control of grid frequency by controlling the operation of doubly fed induction generator and also control regulation of active power of demand and supplied by grid with help of doubly fed induction generator. The evolution of technology related to wind systems industry leaded to the development of a generation of variable speed wind turbines that present many advantages compared to the fixed speed wind turbines. These

wind energy conversion systems are connected to the grid through Voltage Source Converters (VSC) to make variable speed operation possible. The studied system here is a variable speed wind generation system based on Doubly Fed Induction Generator (DFIG). The rotor side converter (RSC) usually provides active and reactive power control of the machine while the grid-side converter (GSC) keeps the voltage of the DC-link constant. The additional freedom of reactive power generation by the GSC is usually not used due to the fact that it is more preferable to do so using the RSC. This paper deals with the introduction of Doubly fed induction generator, AC/DC/AC converter control and finally the MATLAB simulation and build the model in D-space platform, for isolated Induction generator as well as for grid connected Doubly Fed Induction Generator and corresponding results and wave forms are displayed.

Keywords: DFIG, Rotor Side Converter(RSC), Simulink Diagram, Wind Turbine Modeling, Simulation Result.

MOLECULAR STRUCTURE, VIBRATIONAL AND REACTIVITY DESCRIPTORS ANALYSIS OF 4-[2-(TERT-BUTYLAMINO)-1-HYDROXYETHYL]-2-(HYDROXYMETHYL)PHENOL

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Abstract:

The compound 4-[2-(tert-butylamino)-1-hydroxyethyl]-2-hydroxymethyl) phenol (4BAHEHMP) was chosen for investigation and characterized by FTIR and FT Raman spectral analysis. The compound has been studied significantly by using density functional theory (DFT) calculations by the B3LYP method at the 6-311++G (d,p) basis set level. The calculated results show that the structural parameters can be reproduced well with the predicted geometry. The experimental vibrational frequencies were compared with the scaled vibrational frequencies for the assignment of vibrational bands.In addition to the DFT calculations of the compound, the calculations were performed for Fukui functions to explain the chemical selectivity or reactivity site in the compound. Mulliken atomic charges are calculated for the determination of electronic charge distribution and reactive sites.The chemical and thermal stability of the compound is studied by using DFT method for different temperatures and it shows that thermodynamic parameters increase with increase in temperature.

Keywords: DFT, MPA, Fukui functions, Enthalpy

ISOLATIONAND IDENTIFICATIONOFAZODYE DEGRADING MICRO ORGANISMS

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Abstract:

Industrial effluents containing unreacted azo dyes contaminates the water heavily and is one of the major sources of environmental pollution. Hence bioremediation by removal of dye effluents from water is essential. The aim of this research is to isolate bacterial strains that can efficiently degrade azo dyes and identify the strains using. Wastewater samples were collected from five different zones rich with dye Effluents across Tirupur. 9 bacterial strains were isolated out of which three strains were positive for dye decolorization activity. Biochemical Tests were done for identifying the characteristics of the positive strains. Quantitative analysis was also done for those strains using magenta dye to find out the rate of dye decolorization of each strain. Isolates Culture-5 (D-5) and Culture-6 (C-6), were among the best dye degraders. D-8 was efficient enough to degrade magentadye up to 80% in week.

Keywords-Decolorization, Dye Degradation, Wastewater, Bioremediation.

COMPARITIVEANALYSISOFMACHINELEARNINGANDDEEPLEARNING ALGORITHMSINFAULTDIAGNOSISOF BEVELGEARBOX

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Abstract:

The bevel gearbox is one of the most common types of gearbox. The term refers to the gearbox's tools, such as bevel gears, which are a single-stage unit that interlocks the beveled edges of gears and transfers rotation. The use of vibration measurement analysis for diagnosing gearbox failure has been proven to be efficient. In this work, various time-frequency signal processing techniques are compared for the purpose of obtaining diagnostic data from transitory vibration signals. The experiments carried out on a bevel gear test rig, accelerometer vibration data were used. It was discovered that the Short Temporal Fourier Transform (STFT) did not provide an adequate time resolution to identify the periodicity of the fractured gear tooth due to difficulty

choosing an appropriate window length to acquire the impulse signal as a consequence, a number of deep and machine learning techniques were applied to statistical features, producing outputs including a confusion matrix and a high-accuracy comparison.The LSTM algorithm produced the study's best accuracy, which was 98.65 percent.

Key Words: Confusion matrix, Gearbox, K-star, Random Forest, and Decision Tree

COMPLEX NETWORK BASED FOURIER ANALYSIS FOR SIGNAL PROCESSING

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Abstract:

The design and construction of electronic circuits need the creation of innovative methods for analysing signals for increased performance, which led to the birth of the discipline of signal processing. Signal processing is a branch of electronics and electrical engineering that focuses on the creation and analysis of many types of signals, including electrical, electronic, sound, picture, and video signals. Both the characteristics of the signal and the outcome one wants to achieve decide the technique to be used. The present work is a novel attempt of employing complex network for signal analysis. The potential of complex network and graph features is unveiled by analyzing the Fourier component of a square wave. The transformation upon increasing the number of terms in the Fourier series on the graph features is also investigated.

Keywords: Fourier analysis, Complex network, Graph features

DETECTION OF UROLITHIASIS USING IMAGE PROCESSING TECHNIQUES

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Abstract:

This paper proposes a methodology for urolithiasis detection from medical image of patients using image processing techniques. Urolithiasis known as kidney stone in common terms, a disease where minerals in urine crystalize and form stones which is detected using lab results,

medical imaging techniques and patient's symptoms. It is one of the common diseases across the globe. The proposed method must be able to detect presence or absence of urolithiasis from the medial image report thus eliminating manual examination done by radiologist or nephrologist. For this purpose, the input image is initially preprocessed to eliminate unnecessary details, noise, reconstruct and enhance image after which it undergoes segmentation using thresholding techniques. Finally, detection of presence or absence of urolithiasis from ROI will be done using edge detection methods and ORB.

Keywords: ORB, Otsu's thresholding, segmentation, urolithiasis

SMART SAFETY DEVICE FOR SEWAGE WORKERS

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Abstract:

The sanitation systems are usually cleaned and maintained by sanitation workers manually or with the help of machines. These workers are frequently in close contact with various types of garbage, such as human excreta, household wastes, and other hazardous materials, while working without proper safety measures or equipments, therefore, exposed to a wide range of health risks and diseases. The presence of toxic and unsafe gases in septic tanks and sewers like Ammonia (NH_3), Carbon-monoxide (CO), and Sulphur-dioxide (SO_2), can cause workers to pass out or die. In this paper, a wearable smart safety device for sewage workers is proposed which intends to safeguard their life by providing early notifications for the presence of toxic gases. It also gives notification to other persons like supervisors. If sewage workers are in an emergency, an alarm is raised instantly. The collected sensor data is transmitted to the cloud for further processing and analytics.

Keywords: Arduino Uno, gas sensor, Internet of things, temperature sensor, Wi-Fi module.

COMPARISON OF CRYPTOGRAPHIC ALGORITHMS FOR WIRELESS UNDERGROUND SENSOR NETWORKS SECURITY

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Abstract:

As computer networks, telecommunications, and the Internet become more interconnected and cyber-attacks more sophisticated, it is becoming increasingly critical to ensure privacy, security, authenticity, integrity, availability, and identity of data users. Cryptography is one approach to assure the privacy and security, authentication, integrity, availability, and identity of data users, as well as the data protection of data given to the user, as computer networks grow increasingly linked and cyber-attacks become more sophisticated. Cryptographic techniques are employed for data encryption and decryption. Encryption is the conversion of ordinary text into cypher text, which is unreadable by people and machines alike. Strictly speaking, there are two types of encryption: symmetric and asymmetric. A comparison of encryption methods for wireless subterranean sensor networks is carried out in this research to examine how well they function when applied to the underground network. Five algorithms were chosen to be employed on the wireless underground sensor network for security analysis after. Data Encryption Standard (DES), Triple DES (3DES), Triple Data Encryption Algorithm (TDEA), Advanced Encryption Standard (AES), Blowfish, and RC4 are the five algorithms judged on their ability to safeguard data, the time it takes to encrypt and decrypt data, how each technique manages keys, and how much energy each algorithm expends for encryption and decryption. The performance of the various algorithms changes depending on the inputs.

Keywords: Asymmetric, Cryptography, Decryption, Encryption, Security, Symmetric.

EXTRACTION OF CHITOSAN BY BIOPROCESSING OF SHRIMP SHELL WASTE AND PRODUCTION OF EDIBLE FILM

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Abstract:

The development and production of various types of materials from bio-degradable natural resources have acquired distinct focus due to the rapid growing concerns about the environment. Agricultural and industrial wastes are produced in huge amount worldwide. In Oman and other countries, these wastes are generally not exploited to be re-used or recycled. Agricultural waste materials contain cellulose, extracted to be used in many important processes including the production of bio-plastic and the production of food. People consume seafood and throw the outer shells of these fish, and they do not know the importance of these shells and the chemicals that they contain. One of the major components is chitosan, which used in coating the fruits. The

fruits face many problems like microbial damage, physical and chemical contamination, which lead to loss of quality of the fruits. The production of chitosan edible films starting by collecting the shell waste of shrimp, washing, and drying them then for extracting chitosan there are three main steps which are starting with demineralization, deproteinization, and deacetylation (chitosan). Demineralization done by using diluted hydraulic acid at room temperature with stirring for 24 hr; the step of deproteinization done by using NaOH with stirring for 24 hrs. at room temperature. Moreover, chitin's deacetylation stage for chitosan production requires the use of 50% NaOH. For producing chitosan films add 1% acetic acid solution at 40 °C then adding 1.5 ml glycerol and stirrer for some time then films will be ready for use. Tests for the properties of chitosan films and coated mango from secondary data are reviewed. The outcome is high-quality edible films used for coating fruits and vegetables, and it will increase the shelf life and act as antifungal agents for the preservation of fruits. With the increase in the concentration of chitosan, the effectiveness of chitosan films and the inhibitory of microbiological formation is enhanced.

Keywords: Chitosan, Edible coating, Demineralization, Deproteinization, Deacetylation, Shelf life

STUDY ON REDUCING THE BASE SEDIMENT AND WATER IN CRUDE OIL SEPARATION

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Abstract:

The heavy oils that are extracted from the oil fields are highly viscous with water contents and several basic sediments in it. This present research focus on reduction of the basic sediment and the water content by at least 90% range in the crude oil emulsion mixture. In order to select the demulsifiers with highest effectiveness, the initial step of research include a screening process through that demulsifiers was selected based on price, conducted through utilization of the bottle- test methodology. It was noticed that water- soluble demulsifiers, fatty alcohol ethoxylate, triethanolamine and urea significant effectiveness of 53%(v/v), 48%(v/v) and 44%(v/v) respectively. From the group of oil-soluble demulsifiers, Basorol E2032, Basorol PDB 9935 and TOMAC revealed water separation effectiveness of 58%(v/v), 56%(v/v), 51%(v/v) respectively. The tests were run through injecting ppm levels of the concentration of demulsifiers under

optimal pH and temperature values of 5.5 and 70oC respectively. As per the analysis through software Qualitec 4 analysis system, formulation A revealed highest effectiveness for separation of water from crude oil emulsion in comparison to conventional demulsifiers tested. The demulsifier concentration used for each test was 10 ppm under optimum condition. The formulation A of the demulsifier consisted of 16% of triehanolamine, 0% of urea, 20% fatty alcohol ethoxylate, 8% Basorol PDB 9935, 6% of Basorol E2032, 39% aromatic solvent and 12% of TOMAC. The highest efficiency of water separation of 93% was revealed through application of formulation A followed by formulation B resulted in 84% separation of water from the emulsion that involved usage of demulsifier with exactly the same composition as suggested by Qualitec software including urea. The water separation efficiency revealed by VZB1414 and VZB 1413 were 71% and 63% respectively.

Keywords: Basorol E 2032, Demulsification, Fatty Alcohol Ethoxylate, Qualitec 4 software, Water-in-oil Emulsion.

MARKOV CHAIN APPROACH TO RECTIFIER CIRCUITS

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Abstract:

Rectifiers are unavoidable parts of most of the electronic circuits which necessitate a proper analysis and understanding of the ripple component present at the output of the rectifier. The present study is a novel approach of analyzing the ripple component by constructing a complex network using Markov model. The Markov chain shows that as the ripple component decreases the number of unconnected node increases and self-loop of the last node increases. For the rectifier output without filtering it is found that all the nodes are interconnected through edges. The greater the filtering efficiency the greater is the indegree.

Keywords: Complex network, Markov chain, Rectifiers

DEVELOPMENT OF ELECTRONICS SPECKLE INTERFEROMETRIC WEIGHT SENSOR

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Abstract:

"Electronics Speckle Pattern Interferometry" (ESPI) is a non-destructive and non-contact testing method widely employed in the measurement of strain, crack, and displacement in metallic and non-metallic surfaces. It also finds immense application in the optical technology-based temperature and pressure sensors. The present study is the design and development of ESPI based weight sensor. For the design of the weight sensor, the traditional ESPI setup is modified by constructing a loading device that uses a mechanical loading technique. The loading device works by converting tangential motion to linear motion. The length of the linear motion can be controlled and is changeable on demand. Reference is taken with the inner projectile just touching the metal plate at no load condition, followed by the addition of different weights. Weights varying from 50 g to 1000 g are placed in the designed loading device, and a speckle pattern is recorded. The effect of weight in the produced speckle pattern is analysed. The recorded speckle images are subtracted from a reference image recorded in no-load condition to obtain a fringe pattern. The weight sensor is based on the principle of determining the changes occur in the speckle pattern by the addition of weight. The radius of curvature of a brass plate under different stress is calculated by ESPI technique, and it found to decrease with the increase of load. Thus the study suggests the application of the ESPI technique for developing a weight sensor.

Keywords: Speckle Interferometry, Weight Sensor, Non-Destructive Evaluation

KERF ANALYSIS AND MATERIAL REMOVAL RATE DURING ABRASIVE WATER JET MACHINING OF GFRP LAMINATES

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Abstract:

Non-conventional machining technique like Abrasive Water Jet (AWJ) machining is a good replacement for traditional methods to achieve higher tolerances and machining capabilities.

With a fine jet of ultra-high-pressure water and abrasive slurry, AWJ uses erosion to cut the target material. This study investigates the material removal rate during abrasive water jet machining of Glass fiber reinforced polymer. Pressure, stand-off distance, and abrasive mass flow rate were the three process parameters considered in this study. Experiment was performed according to Taguchi's experimental design. The data was analyzed using analysis of variance (ANOVA) to identify the most important process parameters that statistically influence the Material removal rate (MRR). Bottom kerf width and Top kerf width are considered to find the taper angle from the AWJ machining. Kerf analysis is carried out to judge the optimum values of parameters. The experimental studies reveal that the jet pressure is the most influencing variable for MRR.

Keywords: Abrasive Water Jet machining, Material Removal Rate, Kerf width, GFRP laminates

NOVEL APPROACH TO FISH CLASSIFICATION: FRACTALYSIS AND MACHINE LEARNING BASED APPROACH

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Abstract:

Fractalysis has emerged as a potential analytical tool in almost all branches of science and technology. The non-integer dimension called fractal dimension quantifies the complexity of the system. The present work is an attempt to introduce a novel approach based on fractalysis for the classification of different fishes from simple photographs. Many of the natural phenomena are complex that requires a spectrum of generalised dimensions/multifractals for detailing the system completely. The multifractal analysis of the fish scale images are carried out to obtain the three dimensions box-counting, information, and correlation dimension and these features are given as input parameters for supervised machine learning based classification. The machine learning based analysis employing the fractal features reveals its potential in classification of fishes from the fractalysis of fish scale images.

Keywords: Fractalysis, machine learning, fish, classification.

COMPARATIVE ANALYSIS OF MICROSTRUCTURAL AND MECHANICAL PROPERTIES OF MAGNESIUM FORGED WITH CAST COMPONENTS

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Abstract:
In automobile industry, there is always need for lightweight, higher efficiency and environmentally benefitted systems. Development of industry have a wide range of functional and structural materials for transportation, energy storage and generation. Magnesium has 1.74 g/cm^3 density which is about one-third of aluminum, one quarter of steel and similar to polymers. In this study the main focus is on AZ91D alloy due to its most application in automotive and aerospace industries. AZ91D alloy exhibit excellent strength-to-weight ratio, die-castability, high specific strength, good damping performance, good bio-compatibility. Magnesium has hcp structure with only one active slip system namely basal slip system $(0001)<11\bar{2}0>$. The mechanical characteristics of Mg alloys are valid upto certain temperatures as it shows poor mechanical properties at high temperatures. The study aims to provide knowledge for correlating the microstructural and its mechanical properties by developing a constitutive model. In most automobile applications, cast magnesium is used. But due to porosity and inclusion defects make them weaken in mechanical properties. So, the focus declines towards the forged alloys. For that reason, the mechanical properties for various AZ91D and AZ80A components were parallelly compared along with the aged samples. The forged components showed improved mechanical properties on comparison with the cast alloys.

Keywords: Magnesium forged, Dislocation Model, Microstructural Characterisation, AZ91D.

DESIGN AND KINEMATIC ANALYSIS OF SPOT-WELDING ROBOT

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Abstract:

There is various hazards associated with spot welding. The worker operating the welding setup is exposed to electric shocks, toxic fumes and gases, flying sparks, Fire and explosion, injury due to falling equipment, etc. This paper focuses on developing a spot welding robot that can be controlled by workers using a mobile phone. The robot designed is a Cartesian robot, it performs the welding operation depending on the coordinates fed in the mobile app.

Keywords: Spot welding, Cartesian robot, Design.

METHODICAL ASSESSMENT & TRUTH FLOW ANALYSIS OF WIND TUNNELS

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Abstract:

The use of models to test future aircraft, spacecraft, and automobiles are critical, and a wind tunnel is one of the tools used to test models and, in some cases, actual aircraft. Before allowing aircraft and spacecraft to leave the atmosphere, they must be thoroughly tested. The Yaw sphere's systematic and true flow analysis emphasizes the importance of the size and speed of the model. Engineers can use the Yaw sphere to test a range of alternative configurations to improve the performance of aircraft and vehicles in terms of lift, drag force, and fuel economy. Traditionally, research was conducted using apt wind tunnels of various Mach numbers or from the help of numerical analysis, but in the recent scenario, experimental findings are achieved utilizing the wind tunnel test facility. Before testing a model, the rate of maturity and flow frameworks, such as strain, temperature, velocity, flow angularity, density distribution, and turbulence must be checked in the test section. Instead of using a linear technique, the X, Y, and Z approach the flow of plane fields that are used. The tool can be used to analyze the field flow and maturity degree inside the test segment. This report, which may include a data of field flow diagram of test items, further enables the investigation and analysis. As part of this survey, about 3 of South India's wind tunnel's truthfulness is being investigated. For the chosen wind tunnel, a flow framework forecast will beestablished systematically. The map of data for this flow function will offer decaying velocity and velocity profiles to various ranges of Mach numbers.

Keywords: Yaw sphere, wind tunnel testing, Air data, calibration, truth flow.

SYNTHESIS OF ECO-FRIENDLY BIO-DETERGENT TO REDUCE THE IMPACT OF CHEMICAL DETERGENTS

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Abstract:

Our Environment is degraded by many factors out of which usage of chemical household products plays an important role. Because it is made up of harmful chemical elements that we people rarely notice. To overcome this, Bio-enzyme (bio-based products) with the efficiency that

matches the chemical products in the market can be used. Bio-enzyme (Bio cleaner) is an organic compound produced by the fermentation of fruit wastes (mainly citrus fruits) with the addition of water and yeast. This improves the cleaning properties of the bio-enzymes in the mixture due to the anaerobic process, which helps in cleaning floors and toilets in a better way, also after the fermentation, it forms a bio cleaning liquid with non-toxic, non-flammable & noncorrosive properties. One of the main reasons why bio cleaners are not widely used is because of their shelf life &odor. The usage of natural foaming agents (soapnut) and essential oils will improve the bio cleaning agent to meet the standards of chemical products available on the market. This also helps to reduce bio-waste and turns it into a useful product, so that it can be made available to society at economical and affordable prices.

Keywords: Fruit waste, Fermentation, Bio enzyme, Cleaning, GCMS

DESIGN AND FABRICATION OF FURNACE TRACKER (THERMAL BARRIER COATINGS)

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Abstract:

Furnaces are largely used for melting and heat treatment of metals, with furnace temperature being a significant factor. Data loggers are one of the most popular devices that can be used for temperature monitoring and control during heat treatment processes. Since they cannot operate at high temperatures directly, a thermally insulated protective casing needs to be used to lower the temperature that reaches the data logger within its operating range. As a result, the research focuses on developing and evaluating the effectiveness of an insulation system comprising of alternate layers of stainless steel and hydrated calcium silicate insulation, and comparing it to a similar system with plasma sprayed Tungsten Carbide – 20% Chromium carbide as Thermal Barrier Coating (TBCs) on one surface of the system externally. The 2D heat transfer analysis of the uncoated system performance and coated system performance are performed using COMSOL Multiphysics software. The results of the experiments revealed that the coated system performed better and could withstand heat for longer duration than the uncoated system. The EDAX analysis of the coated sample after experimentation revealed presence of chromium oxide layer which inhibited oxygen diffusion and enhanced the oxidation resistance at higher temperatures. The simulation results were likewise in good accord with the outcomes of the experiment.

Keywords: Heat treatment, Hydrated calcium silicate insulation, Plasma spray, Temperature tracking, Thermal Barrier Coating, Tungsten Carbide coating

RESTRAINED GEODETIC DOMINATION IN THE POWER OF A GRAPH

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Abstract:

For a connected graph G = (V, E), a geodetic dominating set S is said to be a restrained geodetic dominating set if the subgraph induced by V-S has no isolated vertex. The restrained geodetic domination number of G is the minimum cardinality of the restrained geodetic dominating set. The power of a graph G is represented as G^k and is obtained from G by making adjacency between the vertices such that the distance between the vertices is at most k. In this paper, the authors discussed the geodetic number and the restrained geodetic domination number of G^k.

Keywords: Geodetic number, geodetic domination number, restrained geodetic domination number.

DESIGN AND ANALYSIS OF HYBRID ADDER USING ASYNCHRONOUS FINE - GRAIN POWER-GATED LOGIC WITH AND WITHOUT PARTIAL CHARGE REUSEs

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Abstract:

Carry select adder (CSLA) issued in many computational systems to alleviate the problem of carry propagation delay by independently generating multiple carries and then select a carry to generate the sum. However, the CSLA is not area efficient because it uses multiple pairs of Ripple Carry Adders (RCA) to generate partial sum and carry by considering carry input then the, Final sum and carry are selected by the multiplexers(mux). In order to overcome the area efficiency and delay, CBL based SQRT CSLA is preferred and power dissipation in the CBL based SQRT CSLA can be reduced by the proposed AFPL logic. The main objective is to design a CBL based SQRT CSLA –hybrid adder using AFPL logic to reduce power dissipation and to enhance the speed.

Keywords: Carry select adder (CSLA), Square root carry select adder (SQRT CSLA), Asynchronous fine grain power gated logic (AFPL).

CFD ANALYSIS ON REGENERATION OF ROCKET NOZZLE DESIGN

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Abstract:

A rocket nozzle was a mechanical device that controlled the rate of flow, speed, direction, and pressure of the stream that passed through it. Depending on the mission of the rocket, many types of rocket nozzles were employed. The rocket nozzle in discussion was a convergent divergent nozzle. The objectives are to measure the variation in pressure and mach number within a convergent divergent rocket nozzle with various divergent angles. In this article, using Ansys Fluent software, computational Fluid Dynamics (CFD) analysis of key performance parameters such as static pressure and Mach number are explored in detail for a rocket nozzle from inlet to exit. The governing equations were solved using the finite-volume approach in ANSYS FLUENT software, and the divergent angles used in the analysis were 7°, 10°, 13°, and 15°.The meshing of the nozzle geometry produced in ANSYS AUTODYN is then performed. In the analytical software application FLUENT, the mesh geometry was loaded. Pressure, density, velocity, and other properties of the fluid inside the nozzle subjected to supersonic speed were measured using the conventional k-epsilon model. Specific nozzle models' pressure and mach number contours were plotted. The simulation was run in steady state with an oblique shock at a flow velocity greater than mach 1. The results of the simulation demonstrated that as the divergence angle changes, the mach number and other performance variables vary as well. The divergence angle increases with each simulation, and the results are compared to see which nozzle model is the best.

Keywords: Convergent-Divergent Rocket Nozzle, Divergent Angle, CFD Analysis Software, Pressure, Mach Number.

MELTING HEAT TRANSFER AND MHD BOUNDARY LAYER FLUID FLOW OVER A MOVING SURFACE WITH RADIATION EFFECTS

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Abstract:

The present investigation is to study the effects of radiation and melting on MHD flow and heat transfer from a warm, electrically conducting fluid over a moving surface. Using appropriate transformations the flow equations are converted to coupled non linear ordinary differential equations. Initially the momentum equation is linearized by quasi-linearization technique and then the equations are solved numerically by using implicit Finite difference scheme. The representative results for velocity and temperature profiles are illustrated graphically to show the effects of various flow parameters. The influence of moving parameter is to increase the momentum boundary layer. The effect of melting is to decrease the temperature of the fluid in the boundary layer.

Keywords: Magnetic field, Melting parameter, Radiation, moving surface and Finite Difference Technique.

INTELLIGENT SYSTEM FOR DETECTION AND CLASSIFICATION OF DIABETIC RETINOPATHY

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Abstract:

Diabetic Retinopathy is a commonly found medical condition in diabetic patients due to the exceeding limits of diabetes in blood. A severe case of Diabetic Retinopathy will lead to complete blindness. The main reason that Diabetic Retinopathy is dangerous, it shows no or very few symptoms till it becomes severe and incurable. Early-stage detection of Diabetic Retinopathy has a vital role in restoring eye vision and proper treatment. The process of detecting and classifying diabetic retinopathy from retina images is costly and consumes a good amount of time. Also, the detection is done manually by a doctor which makes the detection and classification of the stage prone to errors. An Automated model for the early-stage detection of DR will help the doctors to identify the Diabetic Retinopathy and give proper treatment to those who needed. Diabetic Retinopathy is detected from the fundus images based on the 1) No. of blood vessels, 2) Microaneurysms 3) Exudates. A few attempts are being done to automate the detection and classification of DR from retina images. This work attempts to understand the existing models for automatic diabetic retinopathy detection from the colored fundus image dataset. Various methods experiment on this topic, and all are based on the detection of Diabetic

Retinopathy. These models include many popular algorithms such as SVM, CNN, ResNet, Random Forest, etc. ResNet models were able to generate better results than all the other models.

Keywords: Diabetic Retinopathy, Classification, Blindness, Machine Learning Methods, SVM, Random Forest, CNN

EXPERIMENTAL AND COMPUTATIONAL INVESTIGATION OF LOW REYNOLDS NUMBER AERODYNAMIC CHARACTERISTICS OF FIXED WING RELEVANT TO MICRO AIR VEHICLE (MAVs)

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Abstract:

The low Reynolds number flows (Re) have different aerodynamic properties that create a lot of challenges for designer. The multiple design methodologies were presented and analysed for designing of low-Reynolds-number airfoil. A modern Formula One (F1) racing car shares almost as much in common with an aircraft as it does with a regular automobile. The sports teams spending millions of dollars in each year on field research to development and improve aerodynamics performance of vehicle. The F1 car rear wing uses NACA 2408 which gives better performance in both high and low Reynolds conditions The research related to NACA 2408 airfoil at low Reynolds number are very limited. This research paper focusses on steady wing aerodynamics analysis and flight characteristics of micro air vehicles (MAVs). The performance of NACA 2408 is investigated experimentally and computationally is the main objective of this work. The research looks at the performance of the NACA 2408 and examines factors like flow separation, lift, drag, pressure, velocity contour. This NACA 2408 series is compared with the conventionally used NACA 2412 and NACA 4402 series in MAV design point of view. For design and analysis, the overall methodology employs ANSYS, XFOIL and MATLAB. The 3D printing techniques used for making wing section. The subsonic wind tunnel was used for experimental validation. This also allows designers to create new positive airfoils which are critical for enhancing a MAV efficiency and performance in terms of lift enhancement and drag reduction at low Reynolds number conditions.

Keywords: Low Reynolds Number, Micro Air Vehicle, Formula 1 Airfoil, Drag Reduction.

COMPARATIVE ANALYSIS OF CFD TURBULENCE MODEL FOR A SUPERSONIC NOZZLE AT DIFFERENT CONICAL ANGLE

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Abstract:

A rocket nozzle is a mechanical device which was to design the control of rate of flow, speed, direction and pressure of stream that exhaust through it. This analysis was over a convergent divergent rocket nozzle. The objectives are to measure the pressure and Mach number variation within convergent divergent rocket nozzle with different divergent angle. In this paper computational Fluid Dynamics (CFD) Analysis of various performance parameters like static pressure and the Mach number are studied in detail for a rocket nozzle from Inlet to exit by using Ansys Fluent software. From the public literature survey the geometry of the co-ordinates are taken. A two- dimensional convergent divergent nozzle model is used for the analysis and the governing equations were solved using the finite-volume method in ANSYS FLUENT software. The divergent angles used for analysis were 5°, 9°, 15°,20°. The boundary conditions of the nozzle are specified based on literatures revised. The created nozzle geometry is solid works then exported to ANSYS AUTODYN for meshing. The meshed geometry was imported in the analysis software package FLUENT. The fluid inside the nozzle subject to supersonic speed in standard k-epsilon model and pressure, density, viscosity along with other details were noted down. The pressure contour and Mach number contour particular nozzle models were plotted. The simulation performed in steady state condition, where oblique shock occurred at flow velocity greater than Mach number 1 was captured. After the simulation the results revealed that the divergence angle varies the Mach number and other performance parameters also varies. The divergent angle increases for each simulation and the results were compared in order to suggest the better nozzle model.

Keywords: Convergent-divergent nozzle, axisymmetric flow, K-ε turbulence model, Spalart-Allmaras model, flow separation shock waves.

COMPUTATIONAL AND EXPERIMENTAL INVESTIGATION OF AERODYNAMIC CHARACTERISTICS OF BIOLOGICALLY INSPIRED FLAPPING WINGS

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Abstract:

Ever since the early days, man has always admired flying creatures which inspired human to attempt to build a flying machine. The design complication always higher in flapping type of mechanism compared with fixed mechanism, irrespective of sizes of an airplane. In current scenario flapping wing micro air vehicles (MAVs) are used in several different areas for different applications. In this paper focused on analysis an aerodynamics characterization of flapping wing arrangement used for MAV applications. The bio-inspired flapping wing had chosen to analysis the changes of the flow pattern over the flapping wings. The computational method and experimental methods are used to carry out the results. The wing for analysis were inspired from the great black-backed seagull, which has high aspect ratio wings with pointed wingtips and a high camber wing section. A scaled-down model was considered to complete the experimental analysis. The 3-dimensional wing model made with the help of 3-d printed airfoils. The various aerodynamic parameters were calculated and compared.

Keywords: Flapping wing, low Reynolds number, MAV, seagull bird.

STABILITY IMPROVEMENT IN WATER: MICRO NANOBUBBLES TECHNOLOGY

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Abstract:

This current procedure is intended to examine the stability of micro nano entities produced in deminaralized water. The technology of micro nanobubbles was acknowledged worldwide particularly to control the contaminants in waste water. The micro constituent's namely chemical oxygen demand (COD), biological oxygen demand (BOD), total suspended solids (TSS), total

dissolved solids (TDS) and dissolved oxygen (DO) are measured in pre and post treated water. The retention period of bubbles also examined by adding baking soda, lime and oleic acid surfactants for their stability in water. The results of stability enhancement of water with the volume fraction of above surfactants was 0.025%, 0.05%, 0.075% and 0.1% are also discussed in detail.

Keywords: Micro nano bubbles, Stability, baking soda, lime, oleic acid.

BLOCK CHAIN BASED PREDICTIVE MAINTENANCE FRAMEWORK FOR INDUSTRY 4.0

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Abstract:

Prognostics and Health Management (PHM) is evolving as an aspiring domain in Industry 4.0. The pragma of PHM is inclined towards predicting the faults and failures from the critical health condition indicators of the machinery. The disruptive technologies like Artificial Intelligence (AI), Intent of Things (IoT), Block Chain Technology (BCT) and cloud computing has fortified the sensor deployment in industries thus reigning to instill smartness in industrial maintenance. PHM has germinated as a powerful tool that traces the health indicator values of the industrial equipment whose failure may occur at multiple points. This failure may be catastrophic, damaging life, property and most importantly, the reputation of the industry. Hence, the maintenance sector is steadily marching towards designing predictive maintenance frameworks that taps emerging technologies to predict the onset of failures. One such potential aspirant is Block Chain Technology, which inherently possess the prowess of maintaining immutable records that could be leveraged in monitoring the values of the critical health parameters of industrial equipment. As the industrial maintenance focus on mining the degradation signals that are highly temporal, the BCT would fit as a natural solution to trace the occurrence of faults and failures. The high fidelity of block chains ensures that the happenstances at a site can be observed at all points of industrial monitoring, thus intimating the abnormality in equipment's operating profile. This work concentrates on designing a comprehensive block chain framework that integrates futuristic technologies for industrial predictive maintenance.

Keywords: Predictive maintenance, Block chain technology, Industry 4.0, Machine Learning

CFD ANALYSIS ON EFFECT OF HEAT EXCHANGER OF BIO INSPIRED HEAT EXCHANGERS

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Abstract:

Heat Exchangers are widely used for space heating, refrigeration, air conditioning, power stations, chemical plants and many more. Biologically inspired heat exchanger designs have found an important and wide-spread role in the development of new heat exchangers in the recent past. These designs are giving better heat transfer characteristics compared with conventional designs. These new structures can contribute more towards the development of heat exchangers that are suited for environmental-consciousness sustainable development. In the Present computational study, three bio-inspired simple structures namely the Diamond, Gyroid, Schwarz D has been simulated using finite volume methods in commercial software Ansys Fluent 2020 R1. This is used as a tool for the analysis of Fluids flow and heat transfer. Flow around newly proposed bio-inspired shapes was simulated and the heat transfer characteristics were studied. Streamline contours, velocity contours, temperature distribution for the entire computational domain were obtained from the simulation results. Along the length of the heat exchanger, centre linevelocity, temperature, surface Nusselt numbers, and the total heat transfer rates were plotted.

Keywords: Biologically inspired heat exchangers, Gyroid, Schwarz D, Diamond.

SPATIAL VARIATIONS IN PARTICULATE MATTER AND GASEOUS POLLUTANTS IN GREATER NOIDA

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Abstract

Air Pollution has increased dramatically in recent years due to the exponential rise in vehicles. Particularly in metropolitan cities, like Greater Noida, the number of registered vehicles has increased over the year which has become a point of concern and it becomes essential to address this air pollution problem in Greater Noida. The present study emphasizes on examining the

spatial variability and real-time measurements of gaseous and particulate pollutants along the roadside and also tries to find out the Air Pollution Index (API) which helps to access the air quality of the Greater Noida region during the study period. The data were collected from six different sites within the Greater Noida region to find out the real-time measurements of particulate and gaseous pollutants. Near the roadside of Greater Noida concentration of various primary pollutants like particulate matter (PM_{10} and $PM_{2.5}$) and gases (NO_2 and SO_2) has shown high concentration beyond the permissible limit which can be highly deleterious to human health. Stringent measures and management plan is required to control air pollution.

Keywords: - Vehicles, Air Pollution, Particulate Matter, Gases, Air Pollution Index

FASTEST DATA TRANSMISSION USING PSO ALGORITHM

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Abstract:

Network inserting allots hubs in an organization to low dimensional portrayals and successfully protects the organization structure. In this paper, data transmission takes place with easy and high speed by transferring the data to the nearest data packets with low latency in a secured way. Using PSO algorithm and IAAS as a base we have built this project. Network frameworks, node creation, data queue, energy diagram, data packet all the process are carried out in a structural manner for the data to transmit in a fast and efficient way.

Keywords: Network inserting, PSO, Network Framework, Data Queue.

AN OPTIMIZED FEATURE DESCRIPTOR BASED CNN ARCHITECTURE FOR HUMAN ACTIVITY RECOGNITION USING IMAGE PROCESSING

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Abstract:

One of the most significant study areas in the fields of health and interpersonal interactions in recent years is Human Activity Recognition (HAR) that was focused by lots of researchers in academic as well as industrial. Many Artificial Intelligence (AI) based models are created for the recognition of human action or activities for security purpose; however, these algorithms perform poorly on long-term HAR in the real world because they are unable to extract spatial

and temporal feature pattern from data. A small number of publicly accessible datasets for the identification of physical activities that comprise fewer activities are also available in the literature. In light of these drawbacks, we create a hybrid algorithm based HAR model for actions or activities identification that combines Speed up Robust Feature (SURF) along with the Particle Swarm Optimization (PSO) and Convolutional Neural Network (CNN), with CNN used for model training based on the extracting spatial characteristics. The publically available UCI-HAR, UCI-OPPORTUNITY, and UCI-WIDSM datasets is used to evaluation of the models and the model perform outstanding during the classification of the action or activities of humans. Last but not least, the efficacy of the proposed HAR system is evaluated in order to validate the model performance. This demonstrates that PSO with SURF is used as a feature extraction approach in order to detect the human activities from the videos with a minimum error rate. Here, we achieved 98.65% average accuracy for the all three available datasets during the testing of models with various samples.

Keywords: Human Activity Recognition (HAR) System, SURF Descriptor, Swarm-based PSO, Artificial Intelligence (AI) and CNN.

REVIEW: RETROFITTING TECHNIQUES OF SEISMIC DEFICIENT BEAM-COLUMN JOINT

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Abstract:

In Moment Resisting frames, beam column joint is a crucial zone which is subjected to huge stresses due to shaking of earth during an earthquake. Traditional building not adequately designed as per standard codes are deem to fail under seismic excitation. This paper presents a review on various retrofitting techniques used to improve the performance of beam to column joint. The paper discusses about the effect of seismic activities on various joints, and emphasizes on critical parameters to improve the strength of beam column joint. Three types of retrofitting techniques are primarily discussed in this paper by means of experimental and analytical research work previously carried out. Finally, their advantages and problems related to these techniques are concluded. All techniques are efficient in improving the characteristics performance of beam column joint. Steel Jacketing improved the strength the most but deformation capacity was less compared to the rest of the techniques. FRP wrapping alone was not sufficient in some cases. Members were retrofitted with variations like different angle sizes,

or different no. of layers and the orientation of their placement etc. This would affect the ultimate load carrying capacity of the beam to column joint.

Keywords: Beam-Column Joint, Retrofitting, Steel Jacketing, FRP, Ferrocement.

ENHANCEMENT OF BONDING STRENGTH OF AISI 304 STEEL ALLOY USING LASER SURFACE TEXTURING

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Abstract:
Laser surface texturing is one of the techniques employed for modifying the topography of engineering material surfaces. A nano second laser surface texturing is adopted in this study to generate different textures (grid, horizontal, vertical, square grid, etching and combination of pattern and plane textures) on SS304 flat sheet with an intention to study the effects of these textures on the adhesive bond strength through increased surface area, mechanical inter locking and surface chemistry modification of the adherends with respect to different textures. The specimens with different combinations of textures are bonded using a strong adhesive (Loctite 428) and the effect of the texture combinations on the bond strength are studied by performing lap shear bond strength test. Testing of samples for single lap shear strength revealed that surface texturing by laser critically influences the bonding strength of AISI 304 joints using adhesives.

Keywords: Laser surface texturing, Surface Topography, Adhesive bonding, Bonding strength

EFFECT OF FAILURE MODE CAUSING IN AEROSPACE MANUFACTURING INDUSTRIES AND ITS APPLICATIONS: CONCEPTUAL APPROACH

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Abstract:

The FMEA is a safety and reliability technique which is often used to evaluate, design, and process a system against innumerable potential failure modes. Best practices for hydroelectric plants with earth dams state that continuous monitoring is necessary to guarantee the steady and

dependable operation of the construction components. Engineers frequently utilize FMEA to assess processes that could cause damage to or failure of such structures because it is a self-documented and straightforward procedure. In this paper, a reliable technique that uses electrical and cyber network key component failure modes to gauge the risk in intelligent electrical distribution systems.

Keywords: Aircrafts, Applications, Conceptual, Fracture Mechanism.

AN EXPERIMENTAL STUDY ON THERMAL CONDUCTIVITY OF MGO USING INSULATING POWDER TECHNIQUE

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Abstract:

This is a scientific study of the characteristics and thermal conductivity measurements of powdered medium. Magnesium oxide is frequently used as a powdered high-temperature insulator. Magnesium oxide-insulated thermocouples are tested in five various outcomes and are then presented using graphics. A source of magnesium, magnesium oxide powder is a white powdered mineral. It can tolerate extremely high temperatures and has emerged as the industry-standard powder insulation for temperature sensors. In this study, we used insulating powder apparatus to test the thermal conductivity of MgO. For each test case we can observe that the increasing temperature, the thermal conductivity decreases and thus the thermal conductivity is inversely proportional to the temperature change.

Keywords: Insulating, MgO, temperature, thermal, conductivity

PRIVACY PRESERVATION OF EHR USING BLOCKCHAIN

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Abstract:

An electronic health record (EHR) stores health related data of a patient digitally. These days, this information is tampered with, leading to numerous medical mishaps. Privacy is

also violated when these data are accessed by unidentified individuals. Blockchain, which offers a decentralized, immutable, and verifiable ledger, has recently gained popularity and is employed in a variety of businesses. Using off-chain storage of the record, this technology architecture also addresses scalability challenges and allows for the secure storage of EHR with granular authentication tokens. Therefore, the data and doctor's diagnosis cannot be changed or withdrawn in order to avoid medical conflicts. Secondly, there is a problem with insurance claims involving privacy security. Thus, a way is shown here in which security with regard to the patient's illness is likewise resolved. Thirdly, secure transfer of medical records to non-registered parties.

Keywords: Electronic Health Record, Blockchain, Privacy, Homomorphic Encryption, Proxy Re-encryption.

THERMOHYDRAULIC TRANSPORT CHARACTERISTICS IN OBSTRUCTED MICROCHANNEL WITH/WITHOUT PULSATING FLOW CONDITION AT INLET

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Abstract:

The present work investigates the effect of pulsation on the transport process in a 2D microchannel. The inlet velocity varies sinusoidally in time at a constant dimensionless frequency (St=10) and amplitude of 0.8. The working fluid is considered as water which is made to flow in the obstructed microchannel whiles the microchannel walls were kept at a uniform temperature. The solution of two-dimensional Navier-Stokes equation was performed using the SIMPLE algorithm with the momentum interpolation technique of Rhie and Chow. The simulations were performed in the laminar regime within the Reynolds number range between 100- 500 for the microchannel. The results of pulsating flow simulations had been analysed and compared with non-pulsating flow simulations. It is observed that the effect of pulsation in obstructed microchannel is significant and more enhancement of heat transfer is observed at higher Reynolds number while keeping the friction factor within tolerable limits.

Keywords: Pulsating Flow, Heat Transfer, Laminar, Numerical.

DESIGN AND FABRICATION OF TRIARM COAXIAL HEXACOPTER

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Abstract:

Drones in agriculture can be used for a variety of different task aimed to increase farm crop yields and accurately monitor growth status, simultaneously decreasing time labour and resources. There are too many technologies involved in today's Agriculture out of which spraying pesticides using drones is one of the emerging techniques . Manual pesticide spraying causes many harmful side effects to the personnel involved in the spraying process. While for some specific task a medium sized drone can be used. So that we opted for tri-arm coaxial hexacopter because it has proper and distributed downwash that is suitable for spraying liquids at specified point in the flow field for proper distribution of spray and reducing the wastage .This paved the way to design a drone mounted with spraying mechanism having 360kv high torque brushless motor, 30A esc with one shot, 2500Mah lithium polymer battery,2 blade glass fibre nylon gray propellers, Ardupilot power module, 6 inch transmitter, FS-IA6B Receiver, 32 bit flight controller with aluminium tubes and plates fixed in the drone for monitoring and spraying process and this type of drone reduce time , number of labour and cost of pesticide application.

Keywords; Drone, Spray, Downwash

EPOXY MODIFIED MICRO CONCRETE – A REVIEW

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Abstract:

Concrete is the most flexible, durable and reliable construction material in the world as of the day. Normal concrete is known to be weak in tensile strength, brittle and easily erodible by chemicals and high-velocity water flow. Several materials are being used for repairs however; epoxy is used for bonding concrete as a repair material confidentially by engineers undisputedly. These resins are more commonly used thermoset plastic in polymer matrix composites. These

resins have good adhesion to other materials, good chemical and environmental resistance including insulating properties. The addition of epoxy resin to the concrete improves higher strengths and adhesion, lower permeability, better water-resistance and chemical resistance. During the 1960s, technological investigations concerning modifications of concrete by polymeric materials have brought phenomenal changes in projecting ordinary concrete to modern concrete by improving concrete strengths. Literature and factual figures indicate that even high-performance concrete exhibited distress and deterioration well before reaching their designed service life due to aggressive exposure conditions. Micro concrete is being used confidently as a repair material by engineers with partial modification by adding fly ash, GGBS, along with micro aggregate and cement but curing and penetration of mortar in in accessible area in case of damaged concrete structure. This paper presents a critical review of the development of epoxy modified micro concretes as value added material in concrete technology.

Keywords: Aggressive exposure, epoxy modified concrete, modified epoxy mortar, polymer matrix composites, VOC water-soluble, water-miscible.

EXTRACTION OF TERPENES FROM HERBS USING DEEP EUTECTIC SOLVENTS

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Abstract:

Terpenes are the highly aromatic compounds in herbs having a wide range of effects such as antioxidant, anti-inflammatory, antimicrobial and antifungal activities. The increasing demand for terpenes in flavoring, food, lotions, vaping oils and beverages urges the development of novel and effective methods for their extraction. Deep eutectic solvents (DES) are an alternative to the use of hazardous organic solvents typically used in the industry for the extraction of bioactive compounds. In the present work, 6 different acidic and neutral DES developed based on quaternary ammonium salts, polyol and organic acids were used as green extraction media for the extraction of terpenes from the herb belonging to zingibereceae family. The factors influencing the extraction of terpenes including the type of DES, extraction time and temperature were investigated. Initial screening showed that the DES composed of quaternary ammonium

salt and polyol (1:1) had a greater extraction yield at 70 °*C* for time 2 hours with substrate to solvent ratio 1:4. Furthermore, the fungicidal activity of the extract can be evaluated to use it as mold growth inhibitors in animal feed. Thus, this study highlights the promising potential of using DES to extract bioactive compounds from plant and animal sources.

Keywords: Terpenes, Deep eutectic solvents (DES), fungicidal.

FORECASTING ENERGY DEMAND DUE TO ELECTRIC VEHICLE GROWTH AND HOW SOLAR POWERD MICROGRID CAN HELP

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Abstract:

In 2018, India launched its National Mission on Electric Mobility. Following that, the National E-Mobility Program was established to promote public procurement of electric vehicles and the deployment of charging infrastructure. According to the NITI Aayog's energy policy report, India's demand for energy is expected to double by 2040, with demand for electricity potentially tripling as a result of increased appliance ownership. As India prepares to achieve 30% market penetration of electric vehicles by 2030, sales for this segment are expected to reach 43 million, with a stock of more than 250 million. The demand for electricity to power EVs is expected to rise to nearly 640 TWh by 2030. According to a Brookings Institution India report, electric vehicles will account for the most significant load capacity in the country, higher compared to industries such as steel. Total electricity demand for EVs may vary between 37 and 97 Tw under 33 per cent and 100 per cent penetration of EVs in sales by 2030. This study aims to forecast the growth of electric vehicles (EV) in Kerala and also the future energy demand due this EV growth. Apart from the high energy demand this also requires wide spread charging stations which also put additional burden of infrastructure in addition to the electrical energy to the state-owned electricity provider (KSEB pvt Ltd in Kerala). We also propose solar based microgrid model in stand-alone mode to meet the demand of setting charging stations even in remote areas as distributed production system.

Key words: Electric vehicle, Solar based microgrid, Standalone mode.

PERFORMANCE ANALYSIS OF GLOBAL EXCHANGE TRADED FUNDS IN INDIA

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Abstract:

Exchange Traded Funds (ETFs) are basket of securities which can be bought and sold in the stock market, just like any other stocks or shares. Most of the ETFs track an index or a commodity or a sector. ETFs are attractive as an investment because of their low costs, tax efficiency, and stock like features. In Indian markets ETFs just started to become popular. Over the last few years Indian ETFs have seen a volume growth, most of it going towards Nifty50 ETFs. Global Exchange traded funds are simple investment products that allow the domestic investors to take an exposure to international indices. Nowadays, investors approaching the global market for better returns. Indian ETF market is still evolving, there are only a few international ETFs available. This study aims to examine the performance of selected Global Exchange Traded Funds compared to other ETFs in the market. In our analysis, the Sharpe, Treynor and Jenson ratios are used as risk-adjusted performance measures also evaluates their performance using Data Envelopment Analysis (DEA).

Keywords: Exchange Traded Funds, International ETFs, Performance measures ,DEA.

ESTIMATION OF STATE OF CHARGE AND STATE OF HEALTH OF BATTERIES USING HYBRID METHOD AND RECURRENT NEURAL NETWORK

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Abstract:

This paper uses the hybrid method to estimate state of charge (SOC) for lead acid battery and the recurrent neural network (RNN) technique in order to estimate the state of health of a li-ion battery. The hybrid method utilises (i) the Coulomb Counting Method, (ii) the Electrical Circuit Model, and (iii) a mathematical model based on the Peukert Law in order to estimate state of charge of battery. In this work, the method that is used to measure the internal resistance of the

battery in order to determine the open-circuit voltage and approximate the State of Charge is provided. The LSTM (Long-Short Term Memory) algorithm is used which is based on the recurrent neural network are to determine the State of Health (SOH) of a li-ion battery. Estimation of the battery's state of health can be derived from the NASA Li-ion battery dataset.

Keywords: State of Health, State of Charge, LSTM, Li-ion Battery.

TRIBOLOGICAL STUDIES ON THE LUBRICATION PROPERTIES OF JOURNAL BEARING

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Abstract:

In rotating machinery, such as turbines and internal combustion engines, journal bearings are commonly utilized. Problems can be prevented and time-to-market can be shortened with the capacity to examine bearing behavior early in the product development process (PDP). The finite difference method (FDM) is used as a numerical technique in this work to create a simulation tool for journal bearings in MATLAB software. The simulation tool may be used to analyze various bearing dimensions and can also be used as a virtual test rig to analyze bearing performance in terms of pressure distribution, fluid film thickness, load carrying capacity, and other factors. This makes bearing design even easier.

Keywords: Bearing, MATLAB, Sommerfeld boundary condition, Reynolds number.

EFFICIENT FPGA ARCHITECTURE DESIGN AND ANALYSIS OF LMS ADAPTIVE FILTER

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Abstract

Due to the explosive growth of multimedia applications, the demand for high performance and low power DSP is getting higher and higher. Most widely used fundamental device performed in DSP system is FIR Digital filters. During the past several years researches are done on design methods to reduce the complexity of the FIR filters. The easiest way of designing the FIR filter is by MAC structures than windowing method. MAC is an essential core which is used in every DSP.MAC is composed of an adder, multiplier and accumulator. Speed, area and performance

are the major constraints of the MAC structures. In this paper, concentrating on different MAC structures like Vedic Multiplier based MAC, Modified Booth Multiplier based MAC, Distributed Arithmetic based MAC and Offset Binary based MAC. Proposed MAC unit is efficient in terms of speed and complexity. Comparing these methods and finding the better one in terms of area, delay, and clock speed, latency and throughput. The best method is applied to FIR filter and designs an efficient architecture in terms of area, delay, latency and throughput. Speed of convolution operation of FIR filter is improved using MAC architecture. The coding for architectures are done using Verilog and simulation, synthesis is performed in Xilinx 14.7 Integrated Simulation Environment version.

Keywords: MAC Structures, FIR Filter, DSP.

ANOMALOUS EVENT DETECTION FROM VIDEOS USING 3D CONVOLUTIONAL NETWORKS

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Abstract:

Human behavior recognition in the real-world environment finds plenty of applications including intelligent video surveillance, behavior analysis. Video surveillance has vast application areas especially for indoor outdoor and places. Surveillance is an integral part of security. Today security cameras have become part of life for the safety and security purposes. Video anomaly detection is commonly used in many applications such as security surveillance and is very challenging. A majority of recent video anomaly detection approaches utilize reconstruction models, but their performance is often suboptimal because environmental diversity, the complexity of movements resemblance in different actions, crowded scenarios. Meanwhile, frame prediction-based anomaly detection methods have shown promising performance. In this paper, I propose a novel and robust supervised video anomaly detection method by feature extraction from extracted frames with proper design which is more in line with the characteristics of surveillance videos. The proposed method is equipped with a 3D convolutional network that can better handle semantically informative objects and areas of different scales and capture spatial-temporal dependencies in normal videos. A noise tolerance loss is introduced during training to mitigate the interference caused by background noise. The results show that our proposed method outperforms existing state-of-the-art approaches. Remarkably, our proposed method obtains the accuracy of 97.03% on the UFC Crime dataset.

Keywords: Anomaly detection, Video analysis, 3D Convolutional neural network, Deep learning.

DESIGN AND DEVELOPMENT OF SMART DUSTBIN USING IOT

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Abstract:

A Smartbin for waste management is presented in this work, as an attempt to maintain clean and hygienic environment. The concept of the Internet of Things (IoT) has been implemented through GSM module integrated with Arduino UNO to design this bin along with Bluetooth connectivity. The Bluetooth Controller App is employed for establishing connection with the Bluetooth module. The module is therefore leveraged to detect distance between the user and the bin, and the information enables the planning of an optimal route for the bin to move towards the user. As it detects the object, the lid of the bin opens automatically and allows the object to dispose the waste into it. The waste is then segregated into dry or wet particles and then the lid will get close automatically. Level indicators allow estimation of remaining capacity of the bin to store further waste. On exhaustion of the capacity of the bin, SMS-based notification is provided to the user via a GSM module. In this work, a low cost, user-friendly, economically viable waste management solution to control pollution is demonstrated.

Keywords: Smartbin, Pollution control, Waste management, IoT, Bluetooth Controller app, Smart Controlling, SMS alert, Dry and Wet segregation.

COMPREHENSIVE EVALUATION OF PROPERTIES OF SANDS IN AND AROUND GOA

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Abstract:

Until recently, river sand was the only fine aggregate widely accepted in the construction industry. This material dominated the industry for a long time. This is supported by literary history. Although researchers were working on alternative materials to replace fine aggregates, it gained traction with the construction industry's resource crunch. Industry was looking for substitute materials for river sand. The current study delves into the physical properties of

available sands in and around Goa. Specific gravity, particle size distribution, form, and surface roughness are all factors that influence the properties of fine aggregates. Mineralogical composition, toughness, elastic modulus, and other factors frequently influence the chemical properties of fine aggregates. The rheological and mechanical properties of concretes and mortars have a significant impact on their compressive strength and durability. Five different sand types were investigated, and their suitability was evaluated using physical and mechanical properties. The materials used in the study include coarse silica sand, fine silica sand, river sand, manufactured sand, and standard (as defined by IS650) sand. The properties are compared to those of standard sand. The construction industry necessitates such a thorough investigation. The extensive data is more applicable to the construction industry. In this study, comparison of 7-day compressive strength will be carried out for each type of sand.

Keywords: Fine aggregates, Construction industry, Mechanical properties, Compressive strength.

HYBRID VERTICAL AXIS WIND TURBINE FOR EV CHARGING AND HIGHWAY LIGHTING

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Abstract:

The demand for energy is increasing as natural resources such as coal, oil, and gas are getting depleted. The only way to restore economic balance is to focus more on the development of Green energy from sources such as wind, solar, geothermal, and so on. India is an energy-deficient country and the recent increase in number of electric vehicles has increased the demand for electric energy. Along with residential and commercial energy users, state and federal highways also use a significant amount of energy for road lighting and security purposes. In addition, the number of EV owners is rising daily, which could cause an energy issue in the future. In order to address this issue, we are suggesting the installation of a hybrid vertical axis wind turbine (VAWT) in roads, bridges, and buildings that can continually generate electrical energy in order to satisfy the energy demands. We are attempting to combine solar panels with the market-available VAWT models to create a hybrid device that can use both wind and solar energy simultaneously. In this work, we examine the model's cost-effectiveness and its capacity to satisfy future energy demands.

Keywords: Vertical axis wind turbine, Electric Vehicle, Solar panel.

INFRARED AND VISIBLE LIGHT IMAGE: ENHANCEMENT AND FUSION USING ADVERSARIAL NETWORK

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Abstract:

Infrared image and visible light image fusion is a current hot topic among research scholars due to its numerous applications. Various traditional methods and CNN-based deep learning methods have been proposed for the same over the years. But the major drawback of those methods is that they are not end-to-end models. Human intervention is needed in between to either design fusion rules or to extract features from the source images. The main advantage of adversarial network-based model is that they do not require human intervention in between the fusion. GAN (Generative Adversarial Network) based models are end to end. Also unlike CNN-based models, unsupervised GAN-based models do not require training images. A novel image fusion technique based on adversarial network is proposed through this project, which ensures state-of-the-art performance by first enhancing the source images before feeding them to the adversarial network. Enhanced images have prominent contrast and texture details, which helps in producing a better fused resultant image.

Keywords: Image fusion, Generator, Discriminator, GAN

STRUCTURAL PERFORMANCE OF CONCRETE BEAMS WITH HYBRID REINFORCEMENT IN FLEXURE AND SHEAR

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Abstract:

Fiber reinforced polymer bars have been used as an alternative reinforcement in reinforced concrete flexural members owing to their high tensile strength and superior corrosion resistance properties. This paper attempts to study the performance of concrete beams reinforced with a hybrid combination of steel and various fiber reinforced polymer bars. A three-dimensional finite element modeling of beam specimens of 180x300x1800mm was done in ANSYS Workbench (2021R2) and was subjected to four point bending test until failure. An investigation was conducted to analyse the performance of the different types of fiber reinforced polymer bars and steel bars provided in the tension zone using multiple layers. The ultimate moment capacity was

about 1.65 times higher for the carbon fiber reinforced polymer bars hybrid combination compared to the steel reinforced beam. Moreover, the reinforced concrete beams reinforced with carbon fiber reinforced polymer bar performed better than other fiber reinforced polymers such as (Glass, Basalt, and Aramid fiber reinforced polymer bars). Hence it can be concluded that hybrid reinforcement will be more economical. The developed finite element models account for the constituent material nonlinearities behavior between the reinforcing bars and concrete surfaces. The developed models can accurately capture the behavior and predict the moment capacity and ultimate deflection of reinforced concrete beam using fiber reinforced polymer and steel bars.

Keywords**:** Corrosion, Fiber reinforced polymer bar, Finite element analysis

A REVIEW ON VIRTUAL LEARNING PLATFORM FOR STUDENTS

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Abstract:

At present students go through a lot of hustle to find the right study material at right time, this can consume a lot of time & human efforts finding it in traditional manner, as things progressed the mode of learning has evolved as well. From old shelf libraries to E book learning's but one major problem students still face is the bridge between Students and The Professors due the parting of notes and its updatation in E learning platform, only way to fulfil this drought is E-learning platform.

Keywords: E learning, web application, E-Notes

REAL TIME IOT ENABLED AUTOMATED PLANT DISEASE DETECTION USING DEEP LEARNING MODELS – A REVIEW

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Abstract:

Timely identification of diseases in crops and taking immediate actions to prevent them from being completely destroyed is a key part of agricultural production. Environmental challenges like unfavourable weather conditions and climate changes directly affect the plant growth and it

causes viral infections that can lead to the eradication of the crops. Microorganisms such as bacteria and fungi can also cause various diseases in plants. In order to provide the accurate and better solution for a plant problem, the farmers first need to identify the exact kind of disease that the plant is infected with. The existing method of manual diagnosis of plant diseases by a field expert is time consuming as well as costly. Farmers cannot afford the cost of frequent visits to remote laboratories for diagnosis. The use of advanced and effective deep learning models can solve this problem and predict plant diseases at an early stage. IoT has become very popular in the agricultural industry as it provides state of the art solutions to plant problems. This paper aims to study the recent related works on this area and to analyze the advanced methods and models used in the implementation and to allow future research to learn larger capabilities of IoT and Deep Learning in proactively detecting the plant diseases with improved system performance and accuracy.

Keywords: Internet of Things (IoT), Image Processing, Disease classification, Deep learning.

AN OPTIMAL SUPPLY POLICY FOR TIME DEPENDING DEMAND AND DETERIORATION WITH PARTIAL EXPONENTIAL BACKLOGGING

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Abstract:

We extend the inventory lot-size model in this paper to allow for products to deteriorate at variable rates, and demand is characterized by any log concave function of time that fulfils relatively mild criteria. Partial backlogging is possible with this model. The backlogging rate is a time-dependent, exponentially declining function provided by a parameter. We show that not only does the optimal replacement schedule exist, but that it is also unique. We also show that the inventory system's overall cost is a convex function of the number of replenishments. As a result, identifying a local minimum simplifies the search for the best number of replenishments. Finally, a numerical example is given to demonstrate the findings.

Keywords: Inventory policy, Time-dependent demand, Time-dependent deterioration, Partial exponential backlogging

A SURVEY ON CREDIT CARD FRAUD DETECTION TECHNIQUES USING MACHINE LEARNING

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Abstract:

Credit cards are now widely used for online purchases as a result of the E-Commerce sector's explosive growth. Due to the difficulty in identifying fraudsters in the credit card, credit card fraud has grown to be a significant problem for banks in recent years. Machine learning is extremely important in identifying bank fraud in transactions in order to get over this obstacle. The CreditCard Fraud Detection Problem includes modeling previous credit card transactions using information from transactions that proved to be fraudulent. To forecast the various bank transactions, different machine learning methods are utilized because in machine learning the system is initially trained to predict the output. The effectiveness of Logistic Regression, Random Forest, Naive Bayes, K-nearest Neighbors and adaboost algorithm for detecting credit card fraud is examined and summarized in this work. The assignment uses five different machine learning categorization approaches that are implemented in Python. Accuracy value, f1-score, confusion matrix, precision and recall scores, as well as the auc-roc curve, are used to gauge how well the algorithm performs.

DESIGN AND ANALYSIS OF MODIFIED FIR FILTER FOR SIGNAL PROCESSING APPLICATION

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Abstract:

The Need for high performance and low power digital signal processing is getting increased. Finite Impulse Response filters are one of the most widely used fundamental devices performed in DSP system. The performance analysis of parallel FIR digital filter, These entire filter structures are designed based on Modified Carry Select Adder and Ripple Carry Adder. Exchanging multipliers with adder is advantageous because adders weight less then multipliers in terms of silicon area. The performance of parallel FIR filter structure based on Ripple Carry Adder and Carry Select Adder will be compared.

Keywords: Finite Impulse Response (FIR), Kogge Stone Adder (KSA), Ladner Fischer Adder (LFA).

DETECTION OF AUTISM SPECTRUM DISORDER IN CHILDREN

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Abstract:

Autism Spectrum Disorder (ASD) is a neurodevelopmemtal disorder that decreases the ability of a child to interact with others. The task of identifying a child with ASD is very expensive and time consuming and it also requires the diagnosis by professional doctors. This conventional method of recognizing autistic children, as said earlier, is very time consuming which may lead to the delayed treatment and attention to the children. Thus in this study a deep learning based model is proposed to detect children with autism as early as possible. Thus the early detection of ASD in children using deep learning techniques will help doctors and A family to provide them with better care and treatment through which their social impairments of communication, interactions and imaginations can be eradicated. Here deep convolutional neural network is used for the detection of autistic children. The CNN is trained using an image dataset which consists of images of both autistic and Typically developing children. The system is tested using pre-recorded video sequences of both autistic and non-autistic children. This provides an effective way for the prediction of children with ASD, at an early age, which can help them acquire better care and treatment at an early age.

Keywords: Autism Spectrum Disorder, ASD, Convolutional Neural Networks, Autism, Typically developing, Deep learning, Machine learning.

HETEROGENEOUS FACE RECOGNITION FOR NEAR INFRARED TO VISIBLE IMAGES USING GENERATIVE ADVERSARIAL NETWORKS: A REVIEW

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Abstract:

Near-infrared imaging is a developing field in image processing due to its low-cost and high-quality image synthesis in darkness or low lighting. It is a practical replacement for thermal and actual infrared images and is used widely for night vision and reduces various illumination

issues. NIR imaging has many relevant applications in security, forensics and commercial sectors, such as video surveillance and biometric authentication. The task of Near Infra-Red to visible (NIR-VIS) heterogeneous face recognition refers to matching near-infrared to visual face images of distinctive modalities. Therefore, face matching between NIR and VIS images has drawn much attention in machine learning. So this process of cross-domain image translation is a challenging task due to the sensing gap, domain discrepancies and occlusion of Near-infrared(NIR) and Visual(VIS) images. Deep learning has shown tremendous achievements in reducing the sensing gap, but the limited number of datasets is again an issue. This paper strives to learn the evolution of generative adversarial networks (GAN) models in the deep learning models in HFR and the subsequent advent of CycleGAN models. It shows significantly better performance than the traditional machine learning models that use subspace learning and feature invariant learning methods. This article discusses about some of the deep learning models concerning their use of architecture and resources. Furthermore, it discusses their performance in various datasets understanding tasks like the cross-spectral face generation and face matching.
Keywords: Heterogeneous face recognition, generative adversarial networks, image generation, image to image translation.

SOCIAL DISTANCING VIOLATION DETECTION AND REAL-TIME AUTOMATIC FACE MASK DETECTION SYSTEM

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Abstract:

Numerous thousands of individuals were impacted by COVID-19 globally. For this reason, in our modern-day state of affairs, we want to follow some vital safety precautions like social distancing and carrying masks. To make certain that everybody follows these safety precautions, it is proposed as a device to monitor social distance violations and carry a face mask. In this work, we developed a social distance violation detection method and a real-time automatic face mask detection device. YOLO V5 is used to detect human beings for social distance detection. Calculating the distance between two people involves using the Euclidean distance. A minimum distance of six feet is to be remembered as a threshold value to capture social distance violations. The perspective view of the frame is transformed into a bird's-eye view for greater precision estimation of distance measurement. For face mask detection, the first face has to be detected using the Haar cascade classifier. MobileNetV2 serves as the face mask classifier. Most of the methods do not detect the incorrectly worn face mask from the images. For that purpose, create a new data set that includes masked faces, bare faces, hand masked faces (considered as no mask

faces), faces covered with objects (considered as no mask faces), and incorrectly worn face mask images. Train the face mask classifier primarily with three classes: masked face, incorrectly worn face mask, and face without mask.

Keywords: Facemask Detection, Social Distance Detection, Deep Learning.

BIODIESEL PERFORMANCE AND EMISSION STUDY USING NANO SIZED PARTICLE AS ADDITIVE: A REVIEW

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Abstract:

Nowadays the world is largely dependent on conventional energy sources which are non-renewable and its demand is increasing day by day. The emission due to utilization of these energy resources causes air pollution and human disease. So researchers are focusing their attention on biodiesel as an alternative to diesel. Biodiesel while being renewable, environmental friendly, has poor performance and higher NO_x emission. To eliminate these problems up to some extent, blending with diesel can be done but increasing blending percentage again causes the same problem. To eliminate these demerits of biodiesel researchers are using nano sized particles as additives to biodiesel. A large number of nanoparticles are used as additives and resulted in improved performance and emissions, such as increased brake thermal efficiency, reduced brake specific fuel consumption (bsfc), lower emission of Hydrocarbon (HC) and Carbon monoxide (CO) etc. Apart from poor performance higher NO_x emission is one of the main concern while using biodiesel. Some nano particle reduces NO_x emission while use of some other nano particles result in increases NO_x emission. NO_x emission varies with the concentration of nano particle as well. This paper reviews the research work in which nanoparticles such as CeO_2, TiO_2, GO, CaO, Al_2O_3, Bi_2O_3, SiO_2, ZnO, NiO, Ag-O, CNT, MWCNT, nano water emulsion as well as combination of these nano particles are used as nano additives to biodiesel or biodiesel blends.

Keywords: Biodiesel, Nano additive, performance.

STRESS PREDICTION USING HRV INFORMATION FROM SMART WEARABLE DEVICES THROUGH FEDERATED LEARNING

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Abstract:

Stress is a constant occurrence in most people's lives, people must cope with it on a regular basis. Stress for a long term, or a high level of stress, on the other hand, compromises our safety and disrupts our daily lives. Many health problems related with stress can be avoided if mental stress is detected earlier or if adequate measures are taken in time. When a person gets stressed, there will be notable changes in the heart rate. Heart Rate Variability or HRV information tracks these sorts of changes and they can be used to determine stress earlier. Now a days with rapid popularity of smart wearables such as smart watches and smart bands, it is easy to access people's health information. And undoubtedly with the latest technologies in these wearables, HRV information can be acquired with ease. On the other hand, applications in smart healthcare domain achieves great success by training ML models on large quantity of user personal data. So when dealing with user personal data, we come up with the big challenge of Data as isolated islands and concerns of user privacy. To solve the major problem of data isolation and to provide privacy to users while consuming those user personal data, federated learning can be used. Federated Learning is a creative way to connect machine learning models to these disparate data sets, regardless of where they are stored, and, more crucially, without violating privacy rules. Here, I propose a federated learning solution for stress prediction based on HRV data obtained from wearable devices. Here we use federated learning to aggregate learnt model updates with a dynamic fusion method to improve client selection during training.

Keywords: Federated Learning, Machine Learning, Smart Healthcare, Digital Health, Stress Prediction, Heart Rate Variability, Dynamic Fusion.

REVIEW: SEISMIC PERFORMANCE IN HIGH RISE STRUCTURE WITH SHEAR WALL BOTH WITH AND WITHOUT AN OPENING

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Abstract:
In the seismic performance of high-rise buildings, Shear walls are one of the most inventive earthquake-resistant design strategies. A shear wall is a vertical element or structure which

resists lateral load caused due to wind and earthquakes and can protect buildings from collapse. The shear wall can resist large horizontal forces and support gravity load simultaneously. A shear wall can provide adequate strength and stiffness to the building.In this paper, we have aimed to study various research done for improving the performance of buildings having shear walls with opening and shear walls without opening with different locations, Shapes, Sizes and different parameters like displacement, storey shear, storey drift, stiffness, and bending moment shear force. Earlier work was done on the symmetric building having shear walls with opening and without an opening outline of the project work is a seismic analysis of shear walls with opening and without opening by using the response spectrum method by using software with irregular buildings with different parameters like storey drift, story stiffness, lateral displacement, shear force and bending moment.

Keywords: shear wall, openings, displacement, storey drift.

ANALYSIS AND DETECTION SYSTEM OF ACCIDENT USING THE SURVEILLANCE CAMERAS

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Abstract:

Nowadays, we are unaware of the safety of driving on roads. Accident cases have been increasing day by day. For a long period of time, accidents have been the main cause of road casualties. The city's level of traffic management is improved by the large-scale traffic flow system by its prediction and analysis. In early days, for security purposes, the traffic surveillance cameras have been installed. Hence, it requires manpower to survey each and every road's video streams. The dataset used here is the video streams from the surveillance cameras that automatically analyse and detect the accident conditions. This project aims to detect the probability of an accident occurring or not occurring in the surveillance videos. As these surveillance videos are being recorded, they can be reverted directly to emergency services without any obtrusion. This could save the time wasted by the manual communication, as every second is important to saving lives during an accident.The paper proposes how human life on road can be simplified by using extraction techniques on the surveillance video.

Keywords: Accident detection, Prediction, Traffic management, Surveillance camera.

INTRUSION DETECTION SYSTEM USING MACHINE LEARNING FOR SDN ENVIRONMENT

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Abstract:

Software Defined Networking (SDN) is the considered to be the next face of Internet. By decoupling control and data plane it provides a global network that can be controlled dynamically. Along with significant advantages to network security, SDN also paves the way for new attack vectors. So an intrusion detection system becomes an inevitable part of the SDN. With the improvements in technology, the methods to launch attacks are highly varied. Conventional schemes are not sufficient to defend, so machine learning is incorporated in building an IDS. The work mainly focuses on building an IDS for SDN environment after balancing the dataset and selecting the significant features that contributes to building an efficient model. The model was built using Support Vector Machine, ID3 and AdaBoost algorithms. Among which SVM and ID3 have shown the maximum efficiency. The models were trained and tested using InSDN dataset. The IDS is then implemented in Mininet emulated SDN environment with OpenDaylight controller.

Keywords: Intrusion Detection System, Machine Learning, SDN, Mininet, SVM, InSDN, CicFlowmeter

PARKINSON'S DISEASE DETECTION USING FEDERATED LEARNING

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Abstract:

When it comes to ensuring data security and privacy, the healthcare industry is one of the most exposed. Additionally, cyber attacks are very common in this region. The nature of health data is scattered and highly sensitive. It is critical to implement better technology that supports data privacy, preserves accuracy, and ensures sustainability at the same time in light of recent privacy trends and the rise in cyber attacks in the health sector. To solve this problem, the Federated Learning Technology was employed. Parkinson's is a nervous system neurodegenerative condition that arises when dopamine-producing cells in the ventral tegmental region of the

midbrain are lost or destroyed. Parkinson's symptoms start to appear as dopamine levels drop. Parkinson's disease has a slow rate of progression, and with time, tremors in the hands, arms, legs, chin, and face become more apparent.As the disease progresses, people could have trouble speaking and moving around. Parkinson's disease has no known cure, however certain medications can aid in reducing some of the symptoms of the condition so that people can enjoy normal lives by controlling their symptoms. At this point, it's critical to diagnose the disease in its earliest stages. This paper proposes a speech-based technique for the Parkinson's disease diagnosis by leveraging the advantages of machine learning and Federated Learning technologies.

Keywords: Federated learning, Parkinson's disease, computer vision, Convulational Neural Network (CNN), Support Vector Machine (SVM).

FRUIT YIELD ESTIMATION AND FORECASTING FOR PRECISION AGRICULTURE

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Abstract:

Precision agriculture is an ever-growing domain. Fruit yield estimation and forecasting is a necessary step towards precision agriculture. Reliable and accurate estimation of fruit yield in an orchard helps the farmers to make suitable arrangements. We perform fruit counting on video footage that consists of detecting the fruits, then tracking them frame-by-frame. YOLO V5 (You Only Look Once Version 5) neural network are applied to detect fruits in an orchard. Bounding boxes are extracted from detection and Non-Maximum Suppression (NMS) is performed to avoid multiple detections. The results are then input into the tracking pipeline. DeepSORT algorithm is used for tracking the fruits. By keeping track of the fruits throughout the video frames, it is ensured that we are estimating the total fruit count appropriately when they are detected. Future fruit yield prediction is also carried out usingtime series forecasting by ARIMA model. This work may greatly help the needy farmers in yield estimation and predicting the future yields for sustainable growth.

Keywords: YOLO V5, ARIMA, NMS, DeepSORT.

ANALYSIS OF ANTI-LOCK BRAKING SYSTEM OF AN AUTOMOBILE USING MATLAB SIMULINK

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Abstract:

In this paper, the analysis of the anti-lock braking system of a four-wheeler is carried out using MATLAB Simulink providing input conditions of the slip factor and vehicle velocity. The different aspects of calculations and analysis have been done MATLAB/Simulink environment. A conventional on-road 4-wheeler is considered for Analytical Modeling. A linear dynamic system of the model is created and accordingly, the mathematical equations are written. The Simulink model corresponding to the equations is made in MATLAB Simulink. The system is simulated under step input conditions to get the desired performance characteristics output.

Keywords: Anti-Lock Braking, MATLAB, Simulink, Step input.

RSM AND FEM BASED TEMPERATURE AND BEND ANGLE PREDICTION FOR LASER FORMING OF AL2024

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Abstract:

Laser forming is a malleable process for shaping metal sheets by inducing thermal stresses, the maximum temperature developed in the sheet play a very important role in bending which means that the temperature developed on the sheet surface should be less than the melting temperature of the metal of the sheet that prevent from melting of sheet and also has to induce necessary thermal stresses to cause plastic deformation in the sheet. so, an empherical relationship is developed from the process parameters (power, velocity and spot diameter) to predict temperature and bend angle. A 3D thermo-mechanical finite elemental model is used for analysis and Response Surface Methodology (RSM) is utilized to develop relationship for predicting temperature and bend angle. An investigation on temperature and bend angle developed on Al2024 sheet is performed based on the effects of laser power which varies from 300W to 400W, velocity of laser varies from 5 to 8mm/s, spot diameter varies from 2.5 to 3.5 mm and thickness of the sheet is 0.5mm. A quadratic polynomial equation which gives the relation to predict the temperature and bend angle for various combinations of input process parameters are developed

and the study revealed that there will be an appreciable bending without melting in the sheet can be seen when the temperature developed in the sheet is nearing to 90% of melting temperature. This study also helps in choosing the laser machine for the respective range of processing parameters to cause bending in the plate and empherical equation achieved will save lot of simulation time.

Keywords: Laser forming, Finite elemental simulation, response surface methodology, Al2024.

CHAOTIC TIME SERIES FORECAST BASED ON INDUCED MARKOVIAN NETWORK

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Abstract

The prediction of chaotic time series has been the subject of numerous studies. Predicting a chaotic time series beyond the short time limit is extremely difficult as chaotic trajectories diverge exponentially. Various approaches, including machine learning techniques, have been attempted in the literature to attain better prediction accuracy. Recently, the construction of a complex network has been proposed to analyze the underline dynamics of a given time series. In this work, we propose a network-based time series prediction technique based on Markovian transition probabilities. We demonstrate that the proposed method can effectively forecast chaotic time series to a reasonable time limit. The proposed method is simple and computationally efficient.

Keywords: chaotic dynamics, times series, complex networks, prediction, transition probability.

INDUSTRIAL INTERNET OF THINGS (IIoT) FOR DETECTING THE FAULT IN MACHINERIES USING THRESHOLD VALUES

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Abstract:

Real-time monitoring is the pillar of Industry 4.0's in those numerous systems have been developed to monitor electricity, pressures, temperatures, and other factors in industrial operations. We developed a three-layer framework based on fog computing for Micro

Grid(MG's) economic dispatch. The model is developed to prevent the direct communication of agents and to take benefit of distributed optimization techniques, simultaneously. We developed a modified distributed consensus-based technique to achieve the optimal dispatch solutions in the presence of non-dispatchable and dispatchable power resources with the abrupt changes in attendance status or a load of agents. Our paper focuses on aims to detect the Fault Identification of Industrial Internet of Things (IIoT).The main objective is to identify the power failure of machineries by setting threshold values

- Power-Line fault is to identify.
- Machinery can work with 230V and 50Hz power frequency is an ideal condition.
- Beyond the range (or) lower the range , it indicate as a fault and it send an alert message using Fuzzy c-means algorithm .
- Once the fault occur means
  i) The machine will automatically power off.
  ii) ii) To predict the value as expected and indicate as lower one.

To increase the accuracy, use single feed forward neural network. A mechanical relays used to send a trap signal to circuit breakers. To keep the power grid safe from any other damages. At present micro-controller-based relays are being used to achieve faster fault detection.

Keywords: Industrial IIoT4.0, Micro Grid, Machine-Learning, Neural network.

MODELLING AND SIMULATION ON MECHANICAL BEHAVIOUR OF ALUMINIUM HYBRID COMPOSITES

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Abstract:

Aluminium hybrid composites (AHCs) are widely used in automobile, aerospace and marine industries due to their good mechanical properties, better damping capacity, outstanding corrosion and wear resistance. These composites are prepared using the commercially available aluminium alloy LM6 as the base alloy, whereas, the dried powders (60-100µm) of Mg, Ti, Cu and SiC as the particulate reinforcement (1:0.5:1:3) through stir casting route. The LM6 alloy is melted in the graphite crucible in an electrical furnace at 850^0C where potassium aluminium fluoride is used as the flux to remove slag and to protect from oxidation. The composite is solidified through the gravity die casting process in the form of cylindrical rods and flat sheets, which are used in different mechanical tests (tensile, compression and three-point bending) on electromechanical universal testing machine at low strain rates/speeds. An experimental investigation on the strain rate sensitivity of the hybrid composite is presented under quasi-static

tensile (0.001 s^{-1}), compressive (0.001 s^{-1}) and bending/flexural (1-100 mm/min) loads. The material parameters of six mathematical laws (Holloman, Swift, Ludwik, Ghosh, Voce and Hockett-Sherby) are evaluated by curve fitting method based on the experimental data. Finite element simulation is carried out using ABAQUS software. Relative errors in simulation results compared with the experimental results are 7.51% in tension, 0.85% in compression and 4.17% in flexure. The predicted results of Ghosh and Hockett-Sherby models have good agreement with the experimental results.

Keywords: Aluminium hybrid composites, finite element analysis, strain rate, material models, stir casting method.

DESIGN AND OPTIMIZATION OF LIGHTWEIGHT CONNECTING ROD FOR 4-STROKE DIESEL ENGINE USING ANSYS

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Abstract:

The connecting rod is the intermediate member between the piston and the crankshaft. Its primary function is to transmit the push and pull actions from the piston pin to the crank pin, thus, the reciprocating motion of the piston is converted into rotary motion of the crank. Reduction in vehicle weight is an important issue to improve its efficiency. Therefore, in this paper, the lightweight connecting rod of Mg-Alloy is designed for 4-stroke diesel engine. The connecting rod is modeled in CATIA V5 and then imported to ANSYS 19.2 for static stress analysis and buckling analysis. Maximum stress generated in static analysis is 68.47 MPa for applied load 4319 N at the smaller end of the rod, the larger end is fixed. The maximum stress generated in the connecting rod is lower than the yield strength of used Mg-alloy. In buckling analysis, five modes of failure are considered. Buckling modes are predicted using the eigenvalue method. Multiplication of the applied load by the load multiplier yielded the buckling load. The topology optimization is used to achieve 30% weight reduction in order to improve the shape of the connecting rod. It is found that the optimized model has low stress value as compared to the existing model. The equivalent (von-Mises) stress, equivalent elastic strain and total deformation of the connecting rod are compared before and after the topology optimization. Topology design can be utilized to create a connecting rod that is lighter than the previous design while still able to sustain the same load.

Keywords: Connecting rod, Mg-alloy, static stress analysis, buckling analysis, topology optimization.

PORTFOLIO SELECTION USING LINEAR PROGRAMMING

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Abstract:
In this work we studied portfolio selection using linear programming. Absolute Standard deviation is used to measure the portfolio risk and by this we have discussed how each investor can tolerate risk on investment portfolio. To determine the optimum solution to choose a suitable portfolio to reduce risk is done by using L.P. For this, we analyze some stocks traded in Indian Market and collect some information about their performance. Based on the Market analysis, we have shown the optimization of portfolio by Linear problem model using (Objective & constraint function method) approach to the better selection to get good profit and minimum risk.

Keywords: Linear programming, Portfolio selection, MATLAB.

ASSESSMENT OF GREEN RATING OF A BUILT ENVIRONMENT – A SUSTAINABLE APPROACH

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Abstract:

Indian Green Building Council (IGBC) introduced a system that addresses various criteria for rating the existing buildings and establishes guidelines for improved collaboration framework for defining "sustainability" and connecting projects to issues and solutions that focuses on building O&M, life safety, security, and risk management etc. known as 'IGBC Green Existing Building O&M Rating System'. GRIHA for Existing Buildings rating system and IGBC Green Existing Building O&M Rating System are both 100-point systems. GRIHA consists of 12 criteria categorized under seven sections: Site Parameters, Maintenance & Housekeeping, Energy, Water, Human Health and Comfort, Social Aspects, and Bonus points. In contrast IGBC consists of 6 sections categorized as Site & Facility Management, Water and Energy Efficiency, Health Comfort, and Innovation Category. An existing building of 5-year-old in Bangalore is assessed as per IGBC parameters to recommend for applicable IGBC rating system. It is inferred that all the mandatory points of the category are fulfilled. The present status of the built environment is matched with the "Industry Best Practices Green Certification Category" which lowers the risks of natural disasters and withstands fluctuating energy prices since such projects are better

prepared to mitigate the severe effects. Suggestions provided to improve IGBC rating include eco-friendly commuting practice, use of organic fertilizers for landscaping, a system to reduce the Heat Island effect of the non-roof area, and outdoor light pollution reduction through a lighting system that avoids spreading of the light in a vertically upward direction and systematic documentation of entire maintenance system, thus aiming to higher IGBC category.

QUALITY RESTORATION OF UNDERWATER IMAGES AND THEIR ENHANCEMENT WITH WHITE BALANCE AND HISTOGRAM EQUALIZATION

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Abstract:

Underwater images often have severe quality degradation and distortion because of the characteristics of sea water like light absorption and scattering of light. Use a IFM (image formation model) to unchange the quality of the image and it depends on two parameters: the background light (BL) and transmission map (TM). After this another algorithm used for contrast correction. Here, propose a much better underwater image enhancement method for underwater images in composition of underwater image restoration color and contrast correction and histogram streching. Instead of refining the transmittance in dark channel prior based restoration, robust statistical models of BLs estimation and also the TM of channels estimation and optimizations are perform . To further improve color and contrast of restored image with a dehazed and natural appearance, a variation of white balance is introduced as post-processing. And for increase the brightness a histogram streching algorithm is given. So as to identify the effectiveness of underwater image enhancement, sufficient evaluations are conducted . Results show that the accuracy of underwater images is improved significantly both in terms of subjective visual effect and objective evaluation. Comparisons with other state of-the-art methods demonstrate that our proposed method can achieve higher accuracy of estimated BLs, lower computation time, overall superior performance, and better information retention.

Keywords: Image quality, enhancement, colour improvement.

INVESTIGATING THE LINK BETWEEN DERIVATIVE MARKETS AND ECONOMIC DEVELOPMENT

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Abstract:

The derivatives market is a financial market for derivatives, such as futures contracts or options which are financial products generated from other assets. It has a direct impact on the financial system and makes significant contributions to numerous parts of the economy as a whole. However, due to a lack of supporting facts, a controversy about its influence on economic development has erupted. In the light of this scenario, this study analyses the dynamic relationship between the financial derivative markets and economic development in selected countries (India, China, Japan & USA). All the data required for this study have been obtained mainly from secondary sources. Information on the derivatives market is collected from Bank for International Settlements (BIS) database and data of other variables used in this study is obtained mainly from International Financial Statistics (IFS). A Granger causality test is performed to find the influence of the derivatives market on economic development. The study will be a guiding tool for the investors and researchers who is interested to look onto the derivative markets in present and future.

Keywords: Derivative Markets, Economic Development, Granger Causality test

DESIGN AND ANALYSIS OF THREE-PHASE UPQC UNDER STEADY-STATE AND DYNAMIC-STATE CONDITIONS

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Abstract:

This article investigates the design and performance of a three-phase UPQC in steady state and dynamic state conditions**.** The UPQC consists of the DC link used to connect the voltage compensators in back-to-back arrangement, which is shared by both series and shunt connections. The UPQC's shunt compensator adjusts for load current harmonics. The series compensator addresses problems regarding grid-side power quality, such as grid voltage sags and

swells, by injecting a suitable voltage in phase with the grid voltage during voltage sag and out of phase during voltage swell conditions. An improved SRFT (Synchronous Reference Frame Theory) controller has been used with the series and shunt compensator. To maintain the DC-link voltage, the shunt compensator uses a PI controller. The steady state and dynamic performance of the developed model are examined by utilizing Matlab-Simulink and a nonlinear load.

Keywords: power quality, series compensator, shunt compensator, synchronous reference frame, UPQC.

SIMULATION OF CEMENT MORTAR AND CONCRETE PROPERTIES USING VCCTL AND THEIR EXPERIMENTAL VALIDATION.

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Abstract:

Concrete testing is very laborious and involves lot of time and material. Testing on iterative mixes might involve a lot of time and material which can be avoided by simulation of concrete properties knowing parameters of individual materials. VCCTL is software used for simulation of concrete or mortar properties. VCCTL stands for Virtual Cement and concrete testing Laboratory. VCCTL is a tool developed by NIST for simulation and prediction of various properties of mortar and concrete. Various properties of concrete/ mortar can be simulated such Particle size distribution, compressive strength, SEM images, pore size distribution, heat of hydration etc. This paper discusses utility of VCCTL software in simulation of various properties of concrete/mortar. Simulated results obtained from VCCTL can be validated though experimental testing. Comparison and validation of various concrete mixes was done and presented in this paper. It can be concluded and stated that VCCTL can be successfully used as a simulation software and replace the actual testing on mortar and concrete. VCCTL helps to simulate the curing of these materials under a wide range of conditions. This software calculates thermal, mechanical, and transport properties of concrete/mortar as a function of their processing.

Keywords: Concrete testing, Microstructure, NIST, Simulation and VCCTL.

A NOVEL ADDITIVE TO MAKE OPTIMISED MIXES IN RMC INDUSTRY

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Abstract:

The concrete is the only material in construction industry which is undergoing revolutionary changes. Researchers are exploring all possible ways to enhance two main parameters of concrete namely strength and sustainability through alternative materials as constituents of concrete. Ready mixed concrete industry across the globe, in particular in India absorbs, and explores new technologies. Many of these technologies are born out of constant quest of inventors for improving durability, sustainability and also in optimizing the mixture proportions. The product developed called Novel Additive is designed to reduce cement/cementitious contents of concrete mixes, gives strength equivalent to that of a control concrete mix at even higher water cement ratios for the same mix. The objective of this study is to bring out the performance of concrete incorporated with this innovative additive. The present work deals with a laboratory investigation basically to understand the efficacy and efficiency of the Novel Additive used in concrete so as to reduce overall production cost of concrete without compromise in the quality and strength of the end product.

The concrete mix of M40 grade with 150 lt. of water and equal amount 225kg of cement and GGBS, resulting w/c ratio 0.33 of a control mix is compared with the mix which has 2% of Novel Additive and 175kg of both cement and GGBS in it (w/c ratio of 0.43). The variation in strength achievement is negligible even with the reduced cement consumption by almost 28-30%. The level of optimisation of cement in concrete mixes indirectly related to cement reduced greener, sustainable concrete with lower carbon footprint.

Keywords: Ready Mix Concrete, Novel Additive, sustainability, cost optimisation, Strength

SECURE CLOUD STORAGE WITH BLOCKCHAIN TECHNOLOGY USING MULTI-KEY AGGREGATION ALGORITHM

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Abstract:

Cloud computing is an emerging technology which provides on-demand availability of system resources, especially data storage and computing power. Cloud computing technology helps for reducing maintenance cost, highly available across the globe, flexible and easy scalability. Even though the cloud computing has many useful services, still we have a security challenges on data integrity and privacy. Blockchain Technology is the most important security solutions for the protection of information stored on Cloud. The Internet uses a centralized method of monitoring, critical information in the database has been easily manipulated or disclosed by cyber criminals or cloud organizations. To address this limitation, researchers offer Chain Privacy, a blockchain-based access to information system. First, customers use blockchain network node account information as an identifier and also redefining cloud-based access control permissions, which would be encoded and retained on the blockchain. Subsequently, customer uses Chain Privacy to create network access, authorization, and cancel procedures. With a huge use of cloud services, information security issues still need to be addressed appropriately.

Data security issues have always been an obstacle in the development of cloud computing, but they must be addressed. At the same time, Blockchain has established itself as a crucial method to ensure security, in particular in terms of consistency, validity, and confidentiality. This paper proposed the Multi-Key Aggregation Security (MAS) in Blockchain and cloud computing, to improve the performance of security. Finally, Enterprise Operating System (EOS) is used to create Chain Privacy. And the results suggest that Chain Privacy could not only protect cybercriminals and managers against unauthorized access to information, but also preserve approved confidentiality.

Keywords: Cloud Computing, Blockchain, Information Security

PERFORMANCE OF SINGLE-PHASE DVR USING CONVENTIONAL PI AND ANN CONTROLLERS

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Abstract:

This paper proposes conventional proportional integral (PI) controller and artificial neural network (ANN) controller of ssingle-phasedynamic voltage restorer (DVR) to enhance the performance of distribution system. The main contribution of this work is designing an ANN controller by using the data obtained from the conventional PI controller for single phase DVR and comparing the performance of both the controllers. For designing the conventional PI controller, two different PI controllers are used for d-axis and q-axis respectively. The optimal PI control parameters are determined using the Zeigler-Nichols method. All the values obtained from the PI controller are then used to train the ANN. The Levenberg Marquardt back propagation algorithm is used as the ANN controller's training algorithm. The goal of ANN controller is to minimize the error between the actual value and the reference value. After the completion of ANN training the ANN controller is installed in place of PI controller. To validate the effectiveness of the PI control and ANN control, three scenarios are included i.e. sag, swell and harmonics conditions. The ANN training and system design is done using MATLAB/Simulink.

Keywords: ANN, DVR, PI controller, Zeigler-Nichol's method.

COMPUTATIONAL IMPLEMENTATION OF L-HISTIDINE BASED MOLECULAR DEVICES AS LOGIC GATES

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Abstract:

The subcomponents of proteins i.e. Amino acids have acknowledged profound recognition for their applications towards designing future switching devices. Here, we probe the transport parameters of one of the three positively charged amino acids i.e., L-Histidine in conjunction with five different electrodes (i.e., Au, Ag, Cu, Pt and Pd) to model distinctive devices. We implement NEGF-DFT approach using self-consistent function towards our computations. The proposed devices exhibit dissimilar rectification ratios (RR) and negative differential resistance (NDR) regimes. The molecular device yields the maximum rectification ratio of 8.1 with Cu

electrodes and the highest peak to valley current ratio of 1.28 with Pd electrodes. Such study proffers the idea of choosing proper electrode for exploring rectification ratio of biomolecules. Moreover, AND Logic gate and OR Logic gate are also proposed using highest RR of Histidine based device.

Keywords: Positively charged amino acids, L-Histidine, Molecular rectifier, Negative differential resistance regime, AND gate, OR gate.

IMPORTANT OF BIODIESEL AND IT'S CHALLENGES IN CI ENGINE

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Abstract:

Energy is a basic requirement for economic development. So that the consumption of energy in all forms has been rising all over the country. Increasing use of fossil fuel causes the environmental problem globally. Looking the huge demand of diesel for transportation and agriculture sector the search of alternative fuel has become inevitable. Looking at the need to reduce emission, research for alternative fuel have increased a lot.

Biodiesel obtained from vegetable oil is comparable to diesel from the point of calorific fuel and emission quality. From the different feedstock of bio diesel, the jatropha seed contains oil in the range from 30 to 50 % by weight. From the point of calorific value, it can be comparable well to any biodiesel as well as to diesel. All the properties like viscosity, cloud point, cetane number, flash point, pour point are nearly equal to diesel.

Research on alternative fuel shows that biodiesel has a promising effect on reducing emission of Co, Co2, HC for all biodiesel and it's blend with diesel without any modification to current engine. The various importance of Biodiesel are environment friendly, Clean burning, No engine modification increase in engine life, nontoxic and biodegradable. The performance parameter and emission are analyzed in a CI engine with Jatropha Biodiesel and it's blend with different parameter.

Keywords: Jatropha Biodiesel, Transesterification, Emission, Challenges

PRIVACY-PRESERVING DATA PUBLISHING MODELS, CHALLENGES, APPLICATIONS AND ISSUES

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Abstract:

The distribution of Electronic Health Records is highly needed for various analysis purposes and medical studies. However, the data should be disclosed to the data recipient in such a way that the privacy of the individual is ensured. Privacy-preserving data publishing is a challenging task because the distributed data should be protected against multiple privacy threats. Several privacy models, methods, techniques have been proposed and studied in earlier works, however, the study concerning privacy models considering adversary background knowledge is very limited. In this study, various privacy models and their attack models have been analyzed and depicted, the main focus of the study is the adversary's background knowledge privacy-preserving data publishing model. Various research challenges in security and privacy have been identified and summarized. Furthermore, the various applications of privacy-preserving data publishing such as Cloud, E-health, Social Network, Agriculture and Smart City have been studied and the need for privacy is briefed. Finally, the paper highlighted the study's intuitions regarding present unresolved challenges as well as probable future approaches in privacy-preserving data publishing.

Keywords: Electronic Health Record, Security, Privacy Models, Background Knowledge.

FEASIBILITY STUDY OF USING C&D WASTE FOR RIGID PAVEMENT CONCRETE

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Abstract:

The estimated C&D waste has amplified from 12 million tons in the year 2000 to 175 million tons per annum in 2013. As per the latest report published by The Brainy Insights, the global C&D waste consumption is expected to grow to $55.54 billion by 2030, at a CAGR of 6.1%

during the forecast period 2022-2030. There is a changed approach towards usage of C&D wastes which addresses the dual problems of waste management and acute shortage of natural aggregates, when recycled aggregates are used in concrete. Road construction takes a significant application as many researchers confirm that construction and demolition waste have a large application for base and subbase courses. It has led to the implementation of State of art construction and technology. The present study is taken up to investigate the compressive strength and water permeability as durability property of concrete with RCA as coarse aggregates at 50% replacement level (RL) in M40 grade concrete for pavement application. It was found that even at a reduction of the strength of 22% at 100% RL of natural aggregates with RCA, depth of penetration of water is 18.3mm assessed as per water permeability test. The study taken up to arrest the strength reduction of concrete with RCA as aggregates showed an improvement of 8% in the concrete mix having 70% cement and 30% GGBS as cementitious content. Hence, both GGBS and RCA as wastes from Industry makes the concrete sustainable reducing the dependence on depleting natural aggregates.

Keywords: Recycled Coarse Aggregates, C&D wastes, Compressive Strength, Water Permeability, Pavement Concrete

FABRICATION OF MULTI-CONFIGURATION UNMANNED AERIAL VEHICLE

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Abstract:

Unmanned Aerial Vehicles (UAVs) have recently been widely employed in a variety of applications such as rescue operations, geographical mapping, building safety inspection, precision crop monitoring, and so on. One of the drawbacks of multi-copters, particularly with quad-copters, hexa-copters and octo-copters, is their limited payload carrying capability and associated expenses. Consider agriculture, where varied capacity drones are required for various tasks with varying payload quantities based on field size and crops. Since this necessitates the purchase of different drones such as quad-copters, hexa-copters or octo-copters for different functions, our concept proposes the use of a single convertible drone. In order to overcome the existing flaws, a Hexa-copter UAV will be designed and fabricated with modular capability, which will aid the transformation of the UAV from Hexa to Quad configuration and vice-versa. The controls of the complete system will be taken care of by the avionics integrated to the flight controller, namely Ardupilot APM 2.8. The firmware will be manually configured with respect

to the configuration of the UAV, and in the long run the entire process will be automated. This ambitious project is in its early phases of development, with the structural feasibility being examined first by designing and constructing the detachable arms, followed by evaluating its flight fitness.

Keywords: Unmanned Aerial Vehicles, flight controller, precision crop monitoring.

ANALYSIS OF TURBULENT FLUID FLOW THROUGH A RECTANGULAR DUCT BY VARYING THE HEIGHT OF THE BAFFLES ATTACHED AT THE LOWER WALL

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Abstract:

The analysis of the fluid flow and heat transfer in a rectangular duct are widely encountered in variety of engineering applications, such as cooling passages of turbine blades, combustors and heat exchangers. One of the methods used to enhance heat transfer in smooth channels of heat exchanger is to place baffles on the channel walls. In the present study, numerical analysis has been carried out to investigate the steady, incompressible, Newtonian turbulent fluid flow and heat transfer in a rectangular duct with baffles attached in the lower wall of the duct. The flow configurations have been simulated using commercial software (ANSYS 2022R1) based on Control Volume Formulation using Semi implicit method for pressure linked equation. Extensive study has been done considering the variation of baffle heights and the effect of the presence and size of the baffle on fluid flow and heat transfer have been analyzed. The variation of primary baffle height keeping the secondary baffle height constant as well as the variation of secondary baffle height keeping the primary baffle height constant have been studied in detail. The flow visualization along with the distributions of velocity, static pressure, turbulent kinetic energy and temperature have been studied thoroughly. The principal observation from the numerical analyses is that the effects of baffle is very prominent on the main flow and they play a vital role in the formation of recirculation bubble in the duct that changes in size and location with the change of the size of the baffles.

Keywords: Turbulent Fluid Flow, Rectangular Duct, Baffle, Flow Visualization, Heat Transfer, Recirculation Bubble

EFFECT OF FIBERS ON RHEOLOGICAL PROPERTIES OF SELF COMPACTING CONCRETE - AN INVESTIGATIONAL STUDY

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Abstract:

Self-Compacting Concrete is an innovative concrete which has the capability of consolidating on its own weight. In the presence of heavy reinforcements, it is difficult to use Normal Vibrating Concrete which may results in uneven distribution of the concrete materials, so as the formation of voids may occur. Under such conditions it is vital to adopt the Self Compacting Concrete which can flow through the available spacing. In this present study, feasibility of use of fibers in designing the Self Compacting Concrete is discussed based on the previous studies. Study shows that application of various fibers at different proportions effect the flow properties of the Self Compacting Concrete. Fibers like Steel fibers having high resistance to flow is found to reduce the flowability of the concrete, whereas natural fibers with lignin and cellulous content resulted in enhancing the fresh properties in parallel with the artificial fibers. The effects of different fibers at different proportions, aspect ratios and properties is discussed in this paper. Significant improvement was found in fresh behavior of the concrete when appropriate dosage of fiber is introduced. In this paper, a detailed review on effect of different fibers and their dosage is discussed.

Keywords**:** Normal Vibrating Concrete (NVC), Self-Compacting Concrete (SCC), Fresh Properties, Fibers, Mineral Admixture (MA), Slump flow, J-ring, L-Box.

THE OUTBREAK OF COVID-19 AND ITS IMPACT ON STOCK PRICES

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Abstract:

The spread of Covid 19 has had unprecedented consequences on the world economy. It has affected both developing as well as developed economies. The stock market is a key driver in the development of any economy. It helps the industry as well as investors alike. The pandemic and the lockdown had a very bad effect on the individuals as well as the nation. This study examines the impact of the lockdown announcement imposed by the Indian government on the different leading sectors of the economy. Nifty Auto, Nifty Bank, Nifty Financial Services, Nifty FMCG, Nifty IT, Nifty Media, Nifty Metal, Nifty Pharma, Nifty Private bank, Nifty Realty, Nifty Oil &

Gas, Nifty Consumer Durables and Nifty healthcare are sectors of NSE taken for the study. Event study method is used for this analysis. To study the impact of an event, most of the studies have used the event study method in the field of economics and finance. Data were collected from the NSE website.

Keywords: COVID-19, Stock prices, Event study method, Financial crisis.

OCCLUSION RESILIENT OBJECT DETECTION UNDER VARIOUS SITUATIONS USING DEEP LEARNING TECHNIQUES: REVIEW

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Abstract:

With the introduction of neural networks, researchers accomplished important frontiers in the field of object detecting technologies**.**Object detection is a pivotal factor in computer vision; it locates and detects objects in images or videos. Object detection is useful for a variety of purposes, including security, consumer electronics, Robot vision and self-driving vehicles Human-computer interaction, There are two approaches for detecting objects: generic object detection and specific object detection. Object detection can be accomplished using both traditional and deep learning techniques. The accuracy of object detection depends on several factors that impair object detecting performance, it includes clutter in image,image condition, occlusions in images. The biggest concern that object detection confronts is occlusion handling. Following work discusses various aspects of object detections robust to occlusion.

Keywords: Occlusion handling, Object detection, Deep learning.

INFLUENCE OF DIAMETER AND COPPER BARS ON INTERFERENCE FIT OF HIGH-SPEED SPINDLE

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Abstract:

Designing and developing a high-speed rotating machine is an engineering challenge. Limited data is available in the literature on the factors that need to be considered for designing such a machine. Rotating components such as rotor stack, sleeves etc are extremely critical and are the key elements for the safe and reliable operation of the machine. This paper attempts to examine

and elucidate the impact of interference fit on the induction motor/generator rotor at an operating speed of >50,000 rpm. The exercise also throws light on the material selection which paves way to selecting the most appropriate material for high-speed application. Extensive analysis using Ansys has been carried out to comprehend the influence of interference fit on the rotor, and it can be emphasized that the hoop stress decrease with a reduction in the outer diameter of the rotor and the inner diameter does not have a significant effect on stresses in the rotor until there is positive contact between the shaft and the rotor at the operating speed. To ensure contact between the shaft and the rotor at operating speed with lower interference fit, the inner diameter of the rotor must be higher and closer to the outer diameter of the rotor. However, the hoop stress in the rotor increases substantially with increased inner diameter. The effect of copper bars on the hoop stress has also been captured and is found that due to the high density of copper, the stresses are significantly higher since the centrifugal forces are directly proportional to the mass of the rotating member.

Keywords- High-speed machines; Rotating machines; Interference fit; Hoop stress.

ANALYSIS OF LEAN IMPLEMENTATION AND PRACTICES IN SME'S USING VSM OF THE PAPER

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Abstract:

There have been many theses carried out on Lean implementation (LI) in larger organizations with specific focus on the automobile industry. Lean implementation among Small and Medium Enterprises (SMEs) has not been so extensively researched. This project attempts to bridge this gap by reviewing the literature that discussed Lean implementation in SMEs with a perspective of identifying the main challenges faced. We applied the Systematic Review Methodology proposed. This methodology allows for more comprehensive and profounder analysis along three stages: planning, conducting, and reporting. We collected information was classified into four categories for more synthesis. The aim of this study is to establish the current position of global understanding of Lean implementation in SME's, including examining the main categories of Lean implementation in the context of SMEs. and Value Stream Mapping (VSM) is a special type of flow chart that uses symbols known as "the language of Lean" to depict and improve the

flow of inventory. In this research, process time and other unnecessary non-value-added activities of an automobile plastic injection molding parts company have been reduced by using various lean manufacturing tools. The current situation is analyzed by showing a current state map. Then after using several lean tools, a future state value stream map has showed by reducing their overall production lead time as well as wastes by considering the suggestions about using lean tools and improved layout.

Keywords: Lean, lean tools, SME, VSM.

PREDICTION OF HOUSE PRICE INDEX USING MACHINE LEARNING TECHNIQUES

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Abstract:

The real estate sector, which comprises housing, retail, hospitality and commercial, is one of the most globally recognized sectors. This sector has proven to be making progress in adapting to technology and is slowly moving towards a data- driven approach. The study aims to investigate the use of machine learning techniques for the prediction of House Price Index (HPI). The study uses secondary data and the research is based on quarterly time series data from the period 2000Q1 to 2020Q4. GDP, population, inflation rate, interest rate, share price index, market capitalization and foreign direct investment are the independent variables chosen to perform the analysis. The procedure involves prediction of HPI from the chosen independent variables with the help of machine learning techniques. The machine learning techniques include linear regression, random forest regression, XGBoost regression and ANN. The developed models are used to generate out-of-sample predictions for property prices. The efficiency of models used to perform analysis can be evaluated with the help of confusion matrix. This study is expected to provide useful information to stakeholders for policy formation and strategies for real estate investments and sustained growth of the real estate market.

Keywords: House Price Index (HPI), Gross Domestic Product (GDP), Artificial Neural Network (ANN)

CREDIT RISK PREDICTION USING DECISION TREE AND NAÏVE BAYES ALGORITHM

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Abstract:

Individual rely on bank loans to meet their personal goals. Interest earned from loans are the major source of income for banking sectors, even though it carries some risk. Credit Risk arises when the borrower not able to pay back the loan with in the predefined period that was prefixed during the issue time. Credit risk modeling is a technique used by lenders to determine the level of credit risk associated with extending credit to a borrower. There are different kinds of credit risk such as credit default risk, concentration risk, country risk. Using the sample data provided by Kaggle dataset different machine learning models such as Decision Tree and Naïve Bayes were prepared for predicting the default probability. Through hyperparameter tuning models were refined. The evaluation of model's performance show that Decision Tree outperformed than the Naïve Bayes algorithm.

Keywords: Credit Risk, Machine Learning, Decision Tree, Naïve Bayes.

RECENT TRENDS IN FABRICATION OF PARTS USING FUSED DEPOSITION MODELING (FDM) – A REVIEW

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Abstract:

FDM, (i.e., fused deposition modeling) belonging to the category of additive manufacturing techniques, was formulated by Stratasys Inc., as a solitary tread process, which can fabricate prototypes of components, parts in 3 dimension using the CAD based designs, thereby lowering down the time of operation required for development of the end component. Amidst the several types of additive manufacturing processes, FDM stands unique due to its flexibility, uncomplicated process of fabrication, low cost of production of components and reduced wastage of materials and hence, the popularity for FDM have increased in the recent years. Even

though, the scope of application of FDM have escalated tremendously in the past years in several industrial sectors, the intricate physical phenomenality taking place during the extrusion of this FDM process, optimization of the parameters related to material processing, algorithms being employed for regulating these parameters during the FDM process have to be explored in detail. Investigating and exploring the physical phenomenality related to the extrusion of materials during FDM and dynamics involved in the deposition of the materials being extruded, will significantly play a vital role in enhancing the quality of the components and parts being fabricated by FDM process. This paper reviews in detail, the various experimental works and research based investigations being carried out w.r.t the parameters of the FDM process, their role in influencing the buildup layers, flow of the materials through the nozzle, deposition of extruded materials, etc., and finally in impacting the quality of the end components.

Keywords: Fused deposition modeling, Additive manufacturing, Material deposition, Nozzle, Extrusion.

LATEST DEVELOPMENTS IN MECHANISMS AND METHODS FOR FABRICATION OF PARTS USING LASER DIRECTED ENERGY DEPOSITION (LDED) – A REVIEW

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Abstract:

Fabrication of intricate components and parts comprising of distinctive metal alloys as a solitary product together with superior material characteristics is of vital demand in several industrial environments including medicine, aerospace, defense etc., where distinctive properties are required at distinctive locations for different application scenarios. Laser directed energy deposition (LDED), is one of the recently evolved technique of additive manufacturing processes and can be categorized as a stable free-nature manufacturing technique, which enables the fabrication of intricate 3D metallic structures layer by layer together with superior accuracy and features identical to that of the wrought metals. Majority of the LDED technologies are powder fed processes and mainly comprises of sensors, lasers, single and numerous nozzles, entirely automated work handling platform and relevant computer aided software for fabrication. As this technique of LDED, amidst other additive manufacturing techniques, possesses a superior degree

of freedom w.r.t structural distribution of both the composition of the material and geometry of the parts, is very much versatile enough to fabricate highly intricate components and structures. Several experimental works have been carried out to fabricate components, from alloys of Ti, steel, alloys of Cu, Ni based super alloys, alloys of Mg and Al etc., using the technique of LDED. This paper reviews in detail, the outcomes of several experimental investigations being carried out w.r.t fabrication of parts and components using the technique of LDED. It also summarizes the impact of the several parameters of this LDED process on the end quality of the component being fabricated.

Keywords: Additive manufacturing, Laser directed energy deposition, Accuracy, 3D parts, Process parameters

ENHANCEMENT OF THE PROPERTIES OF EPDM/NBR ELASTOMERS USING NANOSILICA FOR SEAL APPLICATIONS

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Abstract:

In this research work, we looked at how the different properties of ethylene-propylene-diene monomer (EPDM) and acrylonitrile-butadiene rubber (NBR) as seal materials were affected by the addition of various percentages of nanosilica. To evaluate the effect of the inclusion of the nanosilica, properties including tensile strength, modulus at various extensions, elongation at break, compressive set, hardness, rebound resilience and permeability as well as abrasion resistance are investigated. Results show that adding nanosilica to some formulations may marginally diminish the rubber's strength. However, a more stable modulus at various strains is offered, the rubber's hardness is kept and slightly increased, and the permeability is decreased in both rubbers, with EPDM exhibiting the most pronounced reduction, which is preferable for reducing the effect of explosive decompression. The compression test demonstrates that nanosilica enhances the rubbers' ability to operate well under compression, which is crucial for seal applications.

Keywords: EPDM/NBR, nanosilica, mechanical properties.

CONDITION EVALUATION OF STEEL STRUCTURE BY VARIOUS NDT METHODS FOR REUSE

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Abstract:

Steel is the one most important material to consider regarding development work in the construction industry. As a result, evaluating the condition of steel in real-time is crucial to avoid failure later in the structure's viability. As the strength of the Structure deteriorates due to the passage of time, structural problems may be found such as overloading, material degradation, and physical damage, which can result in reducing the anticipated life span of the structure if used further without any safety preventions. The Government of Maharashtra mandated the Structural Audit for all the buildings that are 15 to 30 years old, for analyzing their physical condition. While conducting a Structural Audit on steel structure, Non-destructive testing methods are adopted. such as Visual Inspection, Ultrasonic Thickness Gauge, Dye-Penetration Test & Vernier Thickness Caliper Test. The Structural Audit is performing over the Mahalaxmi TMT Pvt. Ltd. (Sangam Steel Plant) situated at Wardha, Maharashtra to access the physical condition of the Steel Structure and do the Rehabilitation at optimum cost to increase the life span of the structure.

Keywords: Steel Structure, Structural Audit, Deterioration, Non-destructive test, Rehabilitation, optimum cost

ON THE POTENTIAL OF ORGANOCLAY WITH RESPECT TO CONVENTIONAL FILLERS (CARBON BLACK AND SILICA) FOR EPOXIDIZED NATURAL RUBBER COMPATIBILIZED NATURAL RUBBER/ETHYLENE-PROPYLENE-DIENE MONOMER (NR/EPDM) VULCANIZATES

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Abstract:

In an internal mixer, natural rubber (NR)/ethylene-propylene-diene monomer (EPDM) blend was compounded with onium modified montmorillonite (organoclay or nanoclay), and the mixture was then cured using a traditional sulfuric system. In this work, a compatibilizer consisting of

epoxidized natural rubber with 50 mol percent epoxidation (ENR 50) in 10 parts per hundred rubber (phr) was utilised. Two commercial fillers were utilised for comparison: silica (grade vulcasil-S) and carbon black (grade N330). On a Monsanto MDR2000 Rheometer, cure properties were measured. The lowest values for torque minimum, torque maximum, scorch time, and cure time were found in the organoclay filled vulcanizate. Tensile and tear properties of the vulcanizates were determined during mechanical testing. In comparison to silica and carbon black filled vulcanizates, the improvement of tensile strength, elongation at break, and tear characteristics in organoclay filled vulcanizates was much higher. Organoclay demonstrated the maximum stiffness in terms of reinforcing effectiveness, followed by silica and carbon black loaded vulcanizates. The failure mechanism of the resulting NR/EPDM vulcanizates has been changed as compared to the gum vulcanizates, according to scanning electron microscopy

Keywords: NR/EPDM, Mechanical properties, Nanoclay.

EXPERIMENTAL INVESTIGATIONS ON RESISTANCE SPOT WELDING PROCESS DURING JOINING OF E34 SS4012A GRADE LOW ALLOY STEEL

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Abstract:

The quality of a weld joint is greatly influenced by the welding input parameters. Weld-bead geometry, mechanical attributes, and distortion are a few examples of properties that can be used to describe the joint quality. HR E34 low alloy steel is extensively used in the automobile industry. The material is a high-quality steel that differs from conventional mild steel in that it possesses a special combination of desirable properties. These steels have exceptional yield strength, notch toughness, fatigue characteristics, weldability, and formability. The present article reports on the investigations into the input parameters of resistance spot welding to improve weld quality and weld strength. In order to conduct the experiments, the One-Factor-at-Time method was adopted. The welding current, weld time and electrode pressure were selected as variable input parameter. The output characteristic measured was the tear strength of the welded joint. The experimental results revealed that the welding current of 15kA, welding time of 17 cycles and electrode pressure of 8 bar provided the maximum possible tear strengths of the spot weld joint. The maximum variation in the tear strength of the welded joint was observed by the variation in the welding current.

Keywords: Resistance Spot Welding, Hot Rolled, One Factor At A Time.

TO INVESTIGATE THE PERFORMANCE OF MOLECULAR (BUOYANCY) SEAL IN FLARE SYSTEM

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Abstract:

Flares are important safety devices used in refineries and petrochemical facilities. People safely burn excess hydrocarbon gases which cannot be recovered or recycled. Excess hydrocarbon gases are burnt in the flare systems in an environmentally-sound manner, as an alternative to releasing the vapour directly into the atmosphere. The process of burning these excess gases is similar to the burning of liquefied petroleum gases (LPG), which some of us use as fuel for home cooking. In most flare systems, either a molecular seal (also called a buoyancy seal), or a velocity seal, is used at the base of the flare tip, to ensure a minimum continuous flow of purge gas. Molecular seal systems rely on the difference in densities between the purge gas and ambient air to prevent the air from entering the flare system. With rising energy costs, the ability to reduce the volume of purge gas required is a high priority for many operations — as long as the safety concerns of air ingress in the flare system are not compromised. Taking this into account, it is likely that molecular seals are preferred, as they require a lower minimum required purge gas flow compared to velocity seals. Current market only uses only ellipsoidal dish on inverted shell for reducing the use of purge gas, but I have used a flat dish instead of an ellipsoidal dish. As the pressure drop difference between both the dishes is minimum in-fact in CFD simulation the pressure drops in flat dish less than that of ellipsoidal dish.

Keywords: Flare system, purge gas, molecular seal.

SD-DIVISIBILITY AND SOME RESULTS ON SD-DIVISOR LABELING OF GRAPHS

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Abstract:

Let G= (V(G), E(G)) be a simple, finite and undirected graph of order n. Given a bijectionf:V(G) → {1, 2, ..., |V(G)|}, we associate two integers S = f(u) + f(v) and D = |f(u) − f(v)| with every edge uvin E(G). The labeling f induces on edge labeling f′:E(G) → {0, 1} suchthat for any edge uvin E(G), f′(uv) = 1 if D | S and f′(uv) = 0 if D does not divide S. Let $e_{f'}(i)$

be the number of edges labeled with iϵ {0, 1}. We say f is an SD-divisor labeling if f′(uv) = 1 for all uvin E(G). Moreover, G is SD-divisor if it admits an SD-divisor labeling. We say f is an SD-divisor cordial labeling if $|e_{f'}(0) - e_{f'}(1)| \leq 1$. Moreover, G is SD-divisor cordial if it admits an SD-divisor cordial labeling. In this paper, we define SD-divisibility and SD-divisor pair of numbers and establish some of its properties. We also proved some standard graphs such as star, complete, complete bipartite and wheel graphs are not SD-divisor.

Keywords: Divisor cordial labeling, SD-divisor labeling, SD-divisor graph.

AN EFFICIENT SYSTEM FOR WORMHOLE ATTACK DETECTION IN MANETs

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Abstract:

Mobile Ad-hoc Networks (MANETs) are decentralized remote networks that communicate without prior infrastructure. MANET represents Mobile Ad-hoc Network which is likewise called a remote Ad-hoc network that comprises of a bunch of versatile hubs associated remotely in a self-designed, self-recuperating network without having a decent foundation. MANETs are utilized for military applications such as guaranteeing the convenient progression of data. Because of quick and simple organization they are likewise used to lay out correspondence and give salvage administrations after earth- shudders.MANETs are helpless to numerous security assaults as they utilize remote mechanism for correspondence, for example, wormhole assaults. This assault includes at least two than two malevolent hubs and the information bundle from one finish of the vindictive hub is burrowed to the next noxious hub at the other point, and these information bundles are communicated. The wormhole assault initiated when an enemy make a correspondence connect between two far off hubs by catches the bundle from one area of the organization and sends it to unauthorized area of the organization. To produce counterfeit associations, misdirect the authentic way, changing or dropping the sent bundles which will lead in giving a misleading network topology.Intrusion identification frameworks are the answer for distinguishing wormhole assaults in MANET.The proposed calculation uses Ad-hoc On-Demand Distance Vector (AODV) directing convention to further develop the recognition strategy.

Keywords: Wormhole attack, malicious node, legitimate node, AODV, MANET

BIG DATA AND CLOUD ENABLED GLOBALLY CONNECTED HOSPITALS WITH DISEASE PREDICTION USING MACHINE LEARNING

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Abstract:

The medical field develops day by day. A patient information system based on fingerprints offers a suitable approach to keep track of patient's clinical records. By the use of fingerprint recognition technology, hospitals connected globally can easily retrieve a patient's previous medical history at any hospital, at any time. As a result, treatment will be more successful. The electronic health records of the patients are kept in the cloud, allowing for networked hospitals. In the field of medicine, machine learning is also crucial. The test findings could indicate a specific ailment. Using machine learning algorithms, diseases can be predicted from test results, lab data, or physical parameters. Therefore, if a patient has diseases that a doctor has not anticipated, the sickness can be understood, and the patient can receive additional therapy.

Keywords: Mantra MFS, Fingerprint Technology, Electronic health records, key point, matching point, SIFT.

A REVIEW ON CLOUD COMPUTING SECURITY CHALLENGES, ATTACKS AND ITS COUNTERMEASURES

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Abstract:

The security challenges are more in the area of Cloud computing platform. The On-demand service of Cloud Computing secures a vital role in the industrial development and other IT sectors. This paper will try to provide the information based on the current threats and attacks on Cloud Computing and the solution to those attacks. Cloud Computing provides various set of service models like Platform-as-a-Service (PaaS), Software-as-a-Service (SaaS) and Infrastructure-as-a-Service (IaaS) respectively. The cloud security measures are still a challenging task for organizations and other IT Sectors to handle the external attacks.

Concluding that this survey will leads to give an overview of threats, attacks and vulnerabilities in the era of Cloud platform as well as some of the countermeasures to protect the cloud.

Keywords— Authentication attacks, Malware Injection, Side- Channel, Denial of Service (DoS), Flooding.

EFFECT OF SILICA FUME ON RHEOLOGICAL, MECHANICAL AND DURABILITY PROPERTIES OF GROUND GRANULATED BLAST FURNACE SLAG BASED-GEOPOLYMER CONCRETE

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Abstract:

The need for concrete is growing rapidly every day and cement is utilized to meet the requirement for infrastructure development. The manufacture of cement products releases a huge concentration of CO_2 which impacts the environment, creates pollution and is hazardous to human beings. In order to reduce the demand for cement and CO_2 emission, in this study, alternating cementitious materials like Ground-Granulated Blast-Furnace Slag (GGBS) and silica fume were utilized. In this research ground granulated blast furnace slag based geopolymer concretes with varying percentages of silica fume were prepared by using NaOH and Na_2SiO_3 were cured at ambient temperature. Workability, compressive strength, splitting tensile and flexural strengths were investigated. NaOH (14M) and Na_2SiO_3 were utilized as alkali activators. The findings have indicated that the inclusion of silica fume increased the compressive strength of the geopolymer concrete. Splitting tensile and flexural strengths also improved as the silica fume concentration increased. The geopolymer concretes were found highly durable in the presence of 2 percent H_2SO_4, 5 percent Na_2SO_4 and 5 percent NaCl.

Keywords: Geopolymer Concrete, Fresh Properties, GGBS, Silica fume, Compressive strength, Flexural strength, Splitting tensile strength.

UTILIZATION OF SILICA FUME FOR THE PRODUCTION OF SELF COMPACTING GGBS BASED GEOPOLYMER CONCRETE

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Abstract:

Geopolymer concrete is the most predominant alternate for cement concrete in construction industry which can highly reduce the CO2 emission by the cement production. Self-Compacting Concrete (SCC) is also the growing technology that can help to pour the concrete in congested reinforcement sections. The effort is initiated to produce Self Compacting Geopolymer Concrete (SCGC) with Ground Granulated blast Furnace Slag (GGBS) and silica fume as binders in this study. GGBS based geopolymer concrete lacks in rapid setting and sticky nature with the formulation of calcium silicate hydrate gel. Silica fume has most finer particles and it is used to replace the GGBS at 0 to 100 percent at 10 percent increment levels. The impact of various replacement levels of silica fume with GGBS on the rheology and hardened properties are assessed. The findings indicates that the rise in replacement percentage of silica fume increase the flow properties due to the finer particles which give fluidity. Meanwhile the hardened properties are reduced by increasing the silica fume percentage. However, the mix with 70 percent of GGBS and 30 percent of silica fume attained the compressive strength of 39.8 MPa which is nearer to the mix with full of GGBS and the optimum mix achieved better flow properties. Hence the mix with 70 percent of GGBS and 30 percent of silica fume can chose as optimum mix for the production of self-compacting geopolymer concrete with nominal strength.

Keywords: Silica fume, Self-compacting geopolymer concrete, GGBS, Global warming.

BEHAVIORAL CHANGES OF NON-EXPANSIVE SOIL EXPOSED TO ALKALI CONTAMINATION

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Abstract:

Unplanned disposal of Industrial effluents in open lands is becoming a common practice in most developing regions, significantly impacting soil contamination. Alkali-contaminated soils witness behavioural changes based on the chemical concentration reaching the soil. Kaolinitic soils are more pronounced for their low swelling nature. Kaolinitic soils induce an unexpected swelling, which may not be observed with the changes in moisture content but due to chemical interactions. Alkali spills, leakages, and disposal of end solutions like caustic soda from industries into kaolinitic soil give rise to alkali-induced swelling. In the present work, a kaolinitic soil, i.e., red earth, is chosen for studying its behavioural changes by contaminating with the different concentrations of NaOH (0.1 N, 1 N, 4 N, and 8 N), which is alkaline in nature. The red

earth mixed with NaOH solutions and different properties of soil are evaluated. Th liquid limit and plasticity index values increased by a maximum percentage of 30.1 % and 33.19% for red earth with 1 N NaOH compared to red earth with distilled water.In comparison with OMC and MDD values of red earth with distilled water, the OMC values of red earth with 1 N NaOH increased by 25%, and the MDD value decreased by 5.64 %. The UCS value increased by a maximum of 28 % with 4N NaOH. The red earth showed a maximum free swell of 19.15 % when inundated with 1 N NaOH, and the value dropped to 9.28 % with 8 N NaOH.

Keywords: Kaolinitic soil, NaOH, Swell potential

AN EXPERIMENTAL INVESTIGATION OF DUST BUILDUP ON SOLAR PHOTOVOLTAIC MODULES

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Abstract:

Solar PhotoVoltaic (PV) modules are essential for producing electricity with little maintenance and development expenditures. The power generation and operational performance are degraded when dust gathers on the PV module's surface. In the current study, the heating season was used to evaluate the amount of dust that had accumulated on the PV front cover glass.The research was done in Tirupati, India, to examine how airborne dust particles changed over time on PV modules. Over the course of five weeks throughout the heating season, dust that had accumulated on identical PV modules over varying exposure times was collected. The details of the photovoltaic modules and a summary of the meteorological data are discussed in this paper. The result shows that the average particle deposition density and dust accumulation rate for the heating season varies from 26.92 to 42.53 mg m^{-2} and 3.48 to 6.07 mg m^{-2}, respectively. The elemental analysis reveals that the majority of the dust sample's composition is made up of C, O, and Si components, with Br and Tm components found at trace levels.

Keywords: Renewable energy, photovoltaic modules, dust deposition

EXPERIMENTAL INVESTIGATION ON STRENGTH CHARACTERISTICS OF AN RCC BEAM USING SILICA SAND

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Abstract:

Due to over exploitation of natural sand for the building industry, the use of substitute for fine aggregates such as silica sand is a natural step in resolving the partial reduction of natural aggregates. Research into the diversity of concrete structures dates back to the first half of the century. Concrete made by using silica sand as fine aggregate has been studied to determine the compression and Flexural strength. Therefore, in this research, silica sand was used to replace conventional fine aggregate with a different percentage for making M20 concrete with a water cement ratio of 0.40. Percentage replacements are 25%, 50%, 100% by natural fine aggregates. Cubes and beams are casted and tested for compressive and flexural strength. According to the obtained experimental results, it is proven that silica sand is one of the best ways to integrate nature and can be used in concrete to obtain high compression strength and flexibility.

Keywords: Fine Aggregate, Silica Sand, Compressive Strength, Flexural Strength.

ENHANCEMENT OF PROPERTIES OF CONCRETE USING COCONUT FIBRE AND COCONUT FIBRE ASH

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Abstract:

Concrete is a building material obtained by mixing cement, water and a ratio in an appropriate ratio. As the cost of cement rises day by day, the need for building materials and other essentials to keep up with the growing population is increasing. Therefore, it is necessary to be aware of other binding materials which will replace the cement partially or fully. Building rubble, in this case coconut fibre ash, creates pollution in environment. Coconut fibre is collected, moisture content was removed and roasted in an open area. After that, the fibre disintegrates into ash powder. The ash powder is collected and processed with a 150micron filter.Concrete blocks are

poured and aged for 7, 14, and 28 days, using 0, 5, 10, and 15 percent instead of cement ash and adding 3 times the weight of the cement to random carp. The results show that concrete performance decreases with increasing CFA content and compressive strength increases with healing, but decreases with increasing CFA content. The introduction of coir to the cement has notably improved many of the technical properties of concrete in terms of compressive strength, durability and flexibility.

Keywords: cement, compressive strength, coconut fibre ash, concrete.

DESIGN AND INVESTIGATION OF AUTOMATIC PEST DETECTION AND PESTICIDE SPRAYING DEVICE

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Abstract:

Agriculture is India's lifeblood. In our country, irrigated cropland covers approximately 215.6 million acres. Pest detection in paddy fields is a significant challenge in agriculture, so effective measures to combat the infestation while minimizing pesticide use should be developed. Image analysis techniques are widely used in agricultural science, providing maximum crop protection and ultimately leading to better crop management and production. Monitoring pest infestations is done by hand, but automatic monitoring is being developed to reduce human effort and errors. It can be accomplished using a camera to capture input images and analyse them using machine learning. An agricultural robot is made with a motor driver, and the processor or embedded system is made with a Raspberry Pi3. For machine learning, we use Python code that trains the robot with predefined images. The farmer will profit because this can be controlled from anywhere without working in the field and being exposed to pesticides. He will be unaffected by his health condition.

Keywords: Automatic Pesticide, Agriculture Robot, Raspberry Pi, Image Processing, Machine Learning, and Python.

INNOVATIVE TRAINGULAR TREND ANALYSIS OF MAXIMUM DAILY TREAMFLOW AT THE GAUGING SITES OF GODAVARI BASIN

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Abstract:

Analysis of water resources system of a drainage basin requires long and continuous streamflow data to assess the possible extreme hydrologic conditions. Maximum streamflow analysis is required for the design of hydraulic structures and flood management studies. Innovative Triangular Trend Analysis (ITTA) indicated no significant changes in the trends of sub-series of annual maximum daily streamflow at Manjlegaon of Godavari middle sub-basin as observed in ITA. Non-monotonic upward trends from first to second and fourth sub-series, second to third and third to fourth sub-series against no trend from ITA at Dhalegaon were observed. Non-monotonic downward trend from first to second sub- series was detected at Yelli against downward trend from ITA. At Mancherial of Pranahitha sub-basin, a negative trend from the second to third and fourth sub-series were observed based on ITTA against no trend from ITA. At Somanpally, a positive trend from first to second and negative trend from first to third and second to third sub-series, were detected against negative trend in ITA. No significant changes in the trends of most of the sub-series at Perur as observed in ITA were noticed. At Pathagudem of Indravathi sub-basin, negative trends from first to third and second to third and, positive trends from second to fourth and third to fourth sub-series were noticed against no trend from ITA. Non-monotonic upward trends from first to second and first to third sub-series were observed against positive trend from ITA at Chindnar. A negative trend from second to third and positive trend from third to fourth sub-periods were detected at Sardaput of Godavari lower sub-basin against negative trend from ITA. ITTA showed downward trends in most of the sub-series as observed from ITA at Injaram and Konta. A positive trend from first to second and third to fourth sub-periods against negative trend from ITA at Polavaram were observed. From the above observations, it may be noticed that ITTA provided additional trend information compared to ITA.

Keywords: Annual maximum daily streamflow, Statistical tests, Trend Analysis, Innovative Triangular Trend Analysis, Godavari Basin.

A QUALITATIVE STUDY AND ANALYSIS OF CLAIM PROBLEMS IN INDIAN CONSTRUCTION INDUSTRY

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Abstract:

Most development projects are experiencing claims because of numerous reasons. Claim Emergencies have ascended for ten years because of the entire political situation. These claims seriously affected all gatherings who were working in the construction field. The effect of claim could be followed to cost invade, loss of endeavours and suspension of work, contract end. This examination intends to perceive the simple explanation behind the guarantees in development and exhibit their contrast between respondents regarding the specific, organizational, and association attributes. It also points out the significant variables in producing for the administration of development project claim to anticipate a guaranteed event and alleviate a case's negative effect. The target of the examination was accomplished through a questionnaire survey from a few development organizations. The poll study was led, including the project worker, specialist, customer perspective. The consequence of the study experienced in the SPSS programming for finding the primary consideration that influences the development. The finding shows the nonattendance of site consideration regarding recognizing cases, separation or difficulty to reach of related archives proactively, and clashes created during proprietor/worker for hire exchange are essentially fundamental problems associated with the arrangement of construction claim management system. This work expects to recognize the different claims through survey paper and to perceive the highest affected reasons for construction claims in our southern Region.

Keywords: Claim, Risk, Construction, Cost Overrun.

DETECTION OF PHISHING WEBSITES BY USING MACHINE LEARNING BASED- URL ANALYSIS

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Abstract:

Phishing is a cyber-attack on internet users which makes them to disclose their unique information. Phishing targets on normal internet users to access sensitive information's by means

of counterfeit websites. The anonymous structure of internet helps the attackers to tamper the normal user's information using uniform resource locator. Various phishing website detecting strategies have implemented so far. Strategies such as blacklist, heuristic etc have suggested. Due to a number of inefficient technologies the number of victims has grown exponentially. A strong anti-phishing mechanism is required to strive against phishing attacks. In this proposed system a URL detection technique based on machine learning approaches is introduced. A supervised machine learning method named XGBoost algorithm is employed to detect phishing URL. The proposed system is evaluated with 2000 malicious and 1000 legitimate sites, respectively. The experiments' outcome shows that the proposed method's performance is better than the recent approaches in malicious URL detection.

Keywords: URL, XGBoost, Phishing.

EFFICIENCY OF LIFE DEXTERITY COMPONENT TO COVENANT WITH DEJECTION AMONG WORKING WOMEN

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Abstract:

The current research aims to evaluate the depression level among working women and working mothers. It also focuses on the stressors in the workplace and type of personality, attitude towards work, and coping strategies towards reducing depressive symptoms. Many of the studies have indicated that females experience more stress and depressive symptoms compared to men. Furthermore, this study reveals the association between work pressure and depressive symptoms. Working mothers are experiencing stress and depressive symptoms which are far different from a single woman could experience. In the line of personality, introverts have overtaken others in experiencing a lot of stress and depressive symptoms. Coping strategies like problem-focused and other active coping skills can help women to stay optimized and to build self-resilient characters on their own.

Keywords: Psychological well-being, anxiety, Cognitive skills, and prevention.

COMPREHENSIVE EXAMINATION AND VALUE INVESTIGATION OF PREFERRED MILLETS FOR THE CIRCUMSTANCE STUDY INVENTION

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Abstract:
It is our duty to promote and honor women's rights all year long. But it's crucial to recognize and honor the powerful women in our lives on this International Women's Day. Mothers millets takes great delight in sharing the stories of inspirational change makers this Women's Day—women who have improved society and who serve as role models and honesty, as well as becoming strong role models for other women. a Mothers millets India initiative. Millets are very nourishing. They offer magnesium, potassium, phosphorus, iron, manganese, fibre, protein, and the B vitamins. They have a high alkaline level, which stomach-soothing and easily digested. It is high in fibre and has a protein content of about 15%. Millet is actually a good source of protein, fibre, and a crucial.

Keywords: Millets, benefits of millets, nutrition in millets, health benefits

Forward Flight Performance of Coaxial Mini Unmanned Aerial Vehicle (UAV) for Applications in Mountain Terrain

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Abstract:
Higher power to volume ratio, smaller frame and good ergonomics are some of the significant advantages offered by coaxial rotor configuration Mini UAV for mountain terrain conditions. Although, the hover performance of helicopters is an important parameter to assess its performance, the efficiency and performance in forward flight is also equally important. This paper evaluates various factors influencing advance ratio in forward flight for coaxial rotor Mini UAV. The power requirement exhibits a sharp drop initially followed a surge as the speed rises. The variation is more pronounced at lower blade lengths. Once advance ratio exceeds 0.05, the power requirement increases, however the rise is more gradual at higher blade lengths. It is seen that one blade geometry does not provide optimal aerodynamic performance simultaneously in hover and forward flight due to interference variations between upper and lower rotors.

Keywords: Flight performance, UAV, Terrain Flight, Aerodynamics