ICRDET-22

3rd International Conference on Recent Developments in Engineering and Technology

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Book of Abstracts

Edited by
Praveen Agarwal & Bhavana Mathur

Jointly Organized
by
Rajasthan Technical University, Kota
&
Anand International College of Engineering, Jaipur

www.anandice.ac.in

The 3rd(Hybrid) International Conference on Recent Development in Engineering & Technology(ICRDET)

February 25 (Fri.) – February 26 (Sat.), 2022
Anand International College of Engineering, Jaipur, India
(www.anandice.ac.in)

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The Venue for the 3thICRDET:

Anand International College of Engineering

Agara Road, Near Kanota, Jaipur-303012, Rajasthan, India
TEL : +91-9928755552, +91-9928755553

Supported by

- **Rajasthan Technical University, Kota, INDIA (www.rtu.ac.in)**
- **Anand International College of Engineering, Jaipur, INDIA (www.anandice.ac.in)**

History of ICRDET

History of ICRDET originated when many Engineers and Mathematicians recognized the need to provide greater opportunities to researchers in the field of Engineering and Technology. ICRDET provides a leading forum for the presentation of new advances and research results in the fields of Recent Development in Engineering and Technology. The conference will bring together leading Researchers, Engineers, Scientists and Students from all around the world working in the areas related to the Conference and provide an opportunity to interact and exchange ideas. ICRDET conference series is held annually. With this aim Anand International College of Engineering, established the Organizing Committee of ICRDET.

- Anand International College of Engineering, Jaipur organised the 1st International Conference on Recent Developments in Engineering & Technology in September 14-15, 2019 jointly organized with Rajasthan Technical University, Kota under TEQIP-III RTU (ATU)
- Anand International College of Engineering, Jaipur organised the 2nd (Online) International Conference on Recent Developments in Engineering & Technology in February 26-27, 2021 jointly organized with Rajasthan Technical University, Kota under TEQIP-III RTU (ATU)

Publications

- P. Agarwal, S. Kanemistu, S.D Purohit(eds.), Recent Developments in Engineering & Technology(ICRDET-2019). Conference Proceeding 2019, Anand-ICE, India, ISBN-978-93-5408-571-0
- P. Agarwal, B. Mathur(eds.), Recent Developments in Engineering & Technology (ICRDET-2021). Conference Proceeding 2021, Anand-ICE, India, ISBN-978-81-953996-3-5(under production)

Special Issue of ICRDET-2021

- Advanced Mathematical Tool-Based Internet of Things (IoT)
- Journal of Nonlinear Sciences and Applications
- Engineering and Applied Science Letters (EASL)
- Communications in Mathematics and Applications
- Applications and Applied Mathematics: An International Journal (AAM)
- Proceeding Book of ICRDET-2021

About 3rd ICRDET-2022:

The conference will be held at Anand International College of Engineering, Jaipur, India on 25th-26th February, 2022. The objective of the 3rd ICRDET-2022 is to provide a world class platform to present and discuss all the latest research and results of scientists related to Mechanical, Civil, Electrical, Electronics, Computer Engineering, Mathematics and Sciences. This conference provides opportunities for the different areas delegates to exchange new ideas and application experiences face to face, to establish professional or research relations and to find global partners for future collaboration. We hope that the conference results constituted significant contribution to the knowledge in these up to date scientific field. The organizers of the conference are pleased to invite prospective authors to submit their original manuscripts to ICRDET-2022. The conference will be held every year to make it an ideal platform for people to share views and experiences in Science, Engineering & Technology related areas.

About RTU:

Rajasthan Technical University (RTU) is located in Kota in the state of Rajasthan. It was established in 2006 by the Government of Rajasthan to enhance the technical education in the state. The university has been established in the campus of University College of Engineering, Kota (previously known as Engineering College, Kota), which is located on the Rawatbhata Road, The university currently affiliates about 112 Engineering Colleges, 05 B.Arch., 27 MCA Colleges, 60 MBA Colleges, 48 M.Tech Colleges,01 M.Arch and 02 Hotel Management and Catering Institute. The University aims to provide quality technical education which may help Rajasthan in its technical development and will boost technical environment in the country. The University offers almost all the disciplines related to technical education including Bachelor of Technology, Master of Technology, Master of Business Administration, Master of Computer Applications, and Bachelor of Hotel Management and Catering Technology.

About Anand International College of Engineering :

Anand-ICE, the place where we celebrate excellence and attempt to transform youth into professionals, is amongst the top 10 engineering colleges in Rajasthan.

We groom our students in various streams of engineering and accelerate a career-oriented training program to make these young men and women compete in extremely daunting professional situations. Anand-ICE, one of the finest private engineering colleges in Jaipur, has probably the best brains as teachers and scientists to facilitate premium academic excellence along with the nuances of ethics and human values.

Our top of the line Corporate Learning Program enables the learner to inculcate Employability Skills and to finally secure a good job. This complementary 400-hour training program assures success to each student. A Dedicated Placement Team then ensures employment with Mega-brands like Byju's, Deloitte, JSW Steel Limited, IBM India Pvt. Ltd., to name a few. Our placement policy assures 100% placements even the most challenging market downturns. No wonder why we are preferred over other top engineering colleges in Jaipur.

All this could not be achieved without a state-of-the-art infrastructure, world-class facilities and laboratories that make Anand-ICE to fall in the list of top 5 engineering colleges in Jaipur. No doubt the students get world-class practical learning enabling them to correlate theory with practice effectively.

We also harness the ideas of our students with the help of the Anand Incubation Centre which is established both at the college campus as well as the city, where specialists assist young minds to incubate their business plans and help to turn them into a reality.

At Anand-ICE we have tried to realign the entire system. Hence, we have created clubs and societies that would not only nurture diverse creativity but will also satisfy their curiosities of self-expression.

While there is a long Jaipur engineering college list, choosing the best college in Rajasthan for B-Tech and M-Tech courses is not a tedious job. You can rely on the brand Anand-ICE to transform your child's life. Anand-ICE falls in the premium Jaipur engineering colleges list that makes it all the more trust-worthy to get into the college assuring secured academic future.

We, at Anand-ICE, do not leave anything to chance. We engage and energize students to deliver in the real world.

Conference Messages

Prof. R.A Gupta
Honorable Vice Chancellor
Rajasthan Technical University,Kota

Message

It is undoubtedly a moment of honor and pleasure to get acquainted with the 3rd International Conference on Recent Development in Engineering & Technology, ICRDET (Hybrid)-2022 organizing by Anand International College of Engineering, Kanota, Jaipur on 25th and 26th February, 2022 and also publishing a Souvenir on the occasion. The conference is one of its prestigious kinds in the academic field. The conference gives an array of innumerable opportunities to the research scholars, academicians, teachers, scientists, and students to widen their horizon of knowledge to get indulged in the new advancements of the engineering field and bloom like a glorified tech savvy. The college has not only established the milestone among the other colleges across the globe but also provides the pink city and capital of Rajasthan, Jaipur, a moment of pride to organize such an acclaimed international conference.

There have been frequent changes in technology in recent years such as Artificial Intelligent, Quantum Computing, Blockchain Technology and many more. I am confident that this conference would provide a platform to the researchers, academicians and technocrats to move further in this direction.

I would like to congratulate the Management of Anand-ICE, Jaipur for their initiative to organize such kind of scientific activities. I also appreciate the efforts of Prof. Deepak Bhatia, RTU, Kota and Prof. Praveen Anand-ICE for making this event happen. My assurance says that the conference would be a tremendous and prodigious learning platform to the fervent participants and encourages more to approach such erudite events in the near future.

My heartwarming and uplifting wishes and blessings are there with the college in the form of massive success of the conference.

Mr. Manoj Mittal
Chairman
Anand International College of Engineering

Message

It gives me immense pleasure to welcome you to the ICRDET-2022, being organized at Anand International College of Engineering. It's a privilege to host this International Conference on recent developments in Engineering and Technology.

I am honoured to be a part of Anand International College of Engineering and other divisions of the Anand Group.

Our college is known for its teaching methodology, career-oriented training program, and world class infrastructure. It makes space for creativity and backs innovative and unconventional ideas. Academic excellence in all sectors globally and competitive edge are key elements of Anand College's mission, so that our students can successfully integrate themselves into the global community.

In this light, I am sure that the upcoming convocation of educators and researchers will offer incredible benefits to our students. It will also provide a platform for them to learn internationally.

As Chairman of Anand International College of Engineering, I assure you that I will bring our education sector higher to a level, where the vision of each resident of nation is more clear and they make our nation proud in every industry - technology, management, information technology, etc., not just nationally, but worldwide.

To lighten up the Conference ambiance, I am grateful to have Prof. Praveen Agarwal, Conference General Chair and Prof. Bhavana Mathur, Organizing Chair for taking Anand college on another level in Education sector through their laudable efforts, and would like to extend a special welcome to the International Advisory Board, International Committee Members, National Organizing Committee, Conference Speakers and all the delegates in this Conference.

Ms. Monika Mittal
Vice Chairperson
Anand International College of Engineering

Message

It is a great privilege for Anand International College of Engineering to host the 3rd Hybrid ICRDET - 2022. I would like to extend a warm welcome to all the International & National delegates in our Campus. This Conference is an International platform for the experts in the fields of Mechanical, Civil, Electrical, Electronics, Computer Engineering & Basic Sciences, and provide a unique opportunity for Researchers to share their latest advancements and develop new collaborations.

Anand International College of Engineering is a unique community of students and staff dedicated to exchange of ideas and imparting good quality education to develop in our students a zeal to outshine so that they may steer their professional careers towards the zenith of Excellence.

This Global exposure will definitely impact the thinking and intellectual development of our budding engineers. Also, I am sure that we will be able to satisfy the urge of newer learning and erudite communication among all the participants in this two-day Conference.

I appreciate the efforts of Prof. Praveen Agarwal and Prof. Bhavana Mathur for making this event happen in our College, and am also thankful to the dedicated local team of Programme Committee Members who are constantly striving to make this event a grand success.

I once again welcome all the participants and hope that they will enjoy their stay at Jaipur.

Good Luck and my heartiest wishes for the success of this Conference!!

Prof. Vijay Sharma
Principal
Anand International College of Engineering

Message

It is quite gratifying to note that Anand International College of Engineering is organizing its Third International Conference on Recent Developments in Engineering and Technology (ICRDET-2022), in association with Rajasthan Technical University, Kota on 25 - 26 February 2022.

Organizing such an event at this point of time reinforces our objective of developing an environment for the exchange of ideas towards technological developments. I wish the conference would be able to deliberate on current issues of national and international relevance, particularly in the field of manufacturing, structural design, data mining, networks, electric systems, big data analytics etc.

There have been unprecedented numbers of quality papers that are to be presented in the conference. I am sure that this occasion will provide an affable environment for the researchers 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.

Prof. Praveen Agarwal
Vice Principal
General Chair-ICRDET-2022
Anand International College of Engineering

Message

It is a great pleasure for me to extend a welcome to all of you who are participating in ICRDET-2022, the 3rd International Conference on Recent Development in Engineering & Technology, which is being held in Anand International College of Engineering, Jaipur, India. The conference is jointly organized by Anand-ICE, Jaipur, India, and RTU, Kota, India.

Due to the Covid-19 Pandemic, many participants could not meet face to face that's why we decided to make it hybrid by use of technology. In this conference, we bring together researchers and practitioners from academia, industry, and government to exchange their research ideas and results and to discuss the state of the art in the areas of the conference together in a wonderful city of the world, Jaipur.

There have been quite a big number of applications from different parts of the world and as you know when the number increase task of the organizing committee will increase. Thus it was a very difficult task to select and classify the abstracts for all the participants. We tried to do our best to accommodate many speakers in order to have better and more enjoyable research sessions that will provide more interactions, exchanges among the participants. The talks by eminent speakers and participants will cover a wide range of areas related to the theme of the conference. We believe that this richness will provide the basis for interdisciplinary collaborations.

We are also very thankful to all the publishers' to open the special issues for the conference. We also would very much thank all presenters and participants for their interests in the ICRDET 2022 and believe and hope that each of them will get the maximum benefit in terms of networking and interaction from this meeting.

We would like to thank the honorable Vice-Chancellor, RTU, Kota (Prof. R. A. Gupta) for their guidance and support in organizing this conference. Finally, we also would to thank the honorable Chairman (Mr. Manoj Mittal) and Vice-chairperson (Miss Monika Mittal), Anand-ICE, Jaipur for their support and guidance in organizing this Conference Successfully.

Further, we thank all the plenary speakers that kindly accepted our invitation and spend their precious time sharing their ideas during the conference. Also, we are thankful to Principal (Prof. V. K. Sharma), General Chair(Prof. Deepak Bhatia), Organizing Chairs (Dr. Harish Sharma and Prof. B. Mathur) and all members of the organizing committee.

We apologize for any shortcomings that might not be mentioned unintentionally or may have been forgotten to be mentioned explicitly here. We really hope for their kind understanding, we thank all and each individual that has put their effort to make this occasion possible. We welcome each and every one of you again to this conference; we wish you an enjoyable and productive conference and hope to meet again in next ICRDET.

Prof Deepak Bhatia
General Chair-ICRDET-2022
Rajasthan Technical University,Kota

Message

It's always been a moment of pride and contentment to be a part of the scholarly learning and this time Anand International College of Engineering, Kanota, Jaipur, has given me this undeniable opportunity to be a part of the 3rd International Conference on Recent Development in Engineering & Technology, ICRDET (Hybrid)-2022 on 25th and 26th February, 2022 as the General Chair of the conference.

As we are familiar with the objective of 3nd ICRDET-2022 that is to provide a world class platform to present and discuss all the latest research and results of scientists related to Mechanical, Civil, Electrical, Electronics, Computer Engineering and Basic Sciences. Hence, I firmly believe that this conference is going to provide the openings to all the delegates belonging to the different scientific fields to share new ideas and to uncover worldwide cohorts for future alliance.

Anand International College of Engineering, Kanota, Jaipur has always given the untiring efforts in bringing the knowledgeable nectar around the globe by organizing the conferences, seminars, workshop, and other events. This time also the college has nailed their efforts by organizing the 3rd International Conference on Recent Development in Engineering & Technology, ICRDET (Hybrid)-2022 on 25th and 26th February, 2022. The college has also given me this honor to be a part of the conference as the Organizing Chair.

The conference is going to serve as a tool to all the scholars, academicians, scientists and mathematicians as an update of the technology. The conference will indisputably give the result as the noteworthy contribution to the knowledge in the advancements in the science and technology. The college also offers such an ideal platform for the scholars around the globe every year and I really appreciate such organizations like Anand ICE, Jaipur for putting in such educated endeavors. I am extremely delighted to be a part of such a great conference.

I would like to thank the honorable Vice-Chancellor, RTU, Kota (Prof. R. A. Gupta) for their guidance and support in organizing this conference. Further, I would to thank the Prof. Praveen Agarwal his extra ordinary efforts to making this event happen. I would like to extend my warm thanks to the college for this grand event and an absolute success for it.

My heart is puffed with a sense of gratitude for the college and all the ardent participants who are unquestionably going to make this conference a gigantic success.

Prof. Bhavana Mathur
Organizing Chair-ICRDET-2022
Anand International College of Engineering

Message

It is extremely a great moment of honor and pleasure to announce for the 3rd International Conference on Recent Development in Engineering Technology, ICRDET (Hybrid)-2022 jointly organized by Anand International College of Engineering, Kanota, Jaipur and Rajasthan Technical University Kota on 25th and 26th February, 2022 and also publishing an Abstract book.

ICRDET is a vast canvas that basically involves independent innovations in Engineering and science arena as well as from other technical and scientific streams which intuitively provide excellent opportunities of collaboration to bring about high potentiality for the future.

I extend my heartfelt wishes for the grand success of ICRDET 2022.

Prof. Harish Sharma
Organizing Chair-ICRDET-2022
Rajasthan Technical University,Kota

Message

Anand International College of Engineering, Kanota, Jaipur has always given the untiring efforts in bringing the knowledgeable nectar around the globe by organizing the conferences, seminars, workshop, and other events. This time also the college has nailed their efforts by organizing the 3rd International Conference on Recent Development in Engineering & Technology, ICRDET (Hybrid)-2022 on 25th and 26th February, 2022. The college has also given me this honor to be a part of the conference as the Organizing Chair.

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Hybrid
3rd International Conference on Recent Developments in Engineering and Technology
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February 25 - 26, 2022
Jointly organized by
Rajasthan Technical University, Kota
&
Anand International College of Engineering, Jaipur

ANAND INTERNATIONAL COLLEGE OF ENGINEERING

CONFERENCESCHEDULE

Day-1, 25.02.2022-Friday		
ZOOM LINK: https://zoom.us/j/97277476880?pwd=YzNKVVJEc3ltNGdEZnpBbEJrOUxEQT09		
Between Hours	**Activity Name**	**Session Chair**
09:00am– 01:00pm	**Morning Session**	**Prof. Mani Mehra Prof. SantanuSaha Ray Prof. Rajesh Kumar Prof. JyotindraPrajapati Prof. Praveen Agarwal**
Time	**Keynote Speaker**	**Presentation Titles**
09:00am– 09:30am	**Keynote Talk 1 Prof. Arni S.R. SrinivasaRao**	Artificial Intelligence and Exact Deep Learning Machines
09:30am-10:30am	**Inaugural Session**	
Time	**Keynote/Invited Speaker**	**Presentation Titles**
10:30am – 10:45am	**Invited Talk-1 Prof. SamadNoeiaghdam**	The CESTAC Method to Validate the Results ofVolterra Integral Equations Arising in the Load Leveling Problem
10:45am-11:00 am	**Invited Talk-2 Prof. RuzanaPskhu**	Digital Indology. Some remarks and suggestions
11:00am-11:15 am	**Invited Talk-3 Prof. Amit Kumar Verma**	Some new existence results for a class ofnonlinear SBVP arising epitaxial growth
11:15am – 11:30am	**Invited Talk-4 Prof. Tunde Joseph Taiwo**	Asymptotic of orthogonal polynomials and their associated quantum mechanical systems
11:30am-12:30pm	**Paper Presentation Parallel Sessions**	**GOOGLE MEET LINK: Parallel Session A: https://meet.google.com/udq-dqcv-pac Parallel Session B: https://meet.google.com/jqh-xidy-ecz**
12:30 pm– 01:00pm	**Keynote Talk- 2 Prof. DumitruBaleanu**	Fractional Generalised Operators With Applications: A Point Of View
01:00pm-01:30pm	**LUNCH**	
Between Hours	**Activity Name**	**Session Chair**
01:30 pm– 04:00pm	**Evening Session**	**Prof. DumitruBaleanu Prof. DhananjayGopal Prof. Amit Kumar Verma Prof. HemenDutta Prof. BhavanaMathur**
Time	**Keynote/Invited Speaker**	**Presentation Titles**
01:30 pm– 02:00pm	**Keynote Talk- 3 Prof. Valentina E. Balas**	Phase Trajectory Qualitative Analysis and Applications
02:00 pm– 02:15pm	**Invited Talk-5 Prof. Bhaskar Roy**	A study of turbine failure pattern – a modeloptimization using Machine Learning
02:15 pm– 02:30pm	**Invited Talk-6 Prof. SantanuSaha Ray**	Analytical and Numerical Methods in ModellingRiesz Fractional Nonlinear Schr¨odingerEquationin Quantum Mechanics
02:30 pm– 02:45pm	**Invited Talk-7 Prof. JochenMerker**	Mathematical models of non-local interaction
02:45pm-03:45pm	**Paper Presentation Parallel Sessions**	**GOOGLE MEET LINK: Parallel Session A: https://meet.google.com/udq-dqcv-pac Parallel Session B: https://meet.google.com/jqh-xidy-ecz**
03:45 pm– 04:00pm	**Invited Talk-8 Prof. Carla M. A. Pinto**	Latent reservoir replenishment by pyroptosisandsuperinfection in a HIV transmission model

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Day-2, 26.02.2022-Saturday		
ZOOM LINK: https://zoom.us/j/97277476880?pwd=YzNKVVJEc3ltNGdEZnpBbEJrOUxEQT09		
Between Hours	**Activity Name**	**Session Chair**
09:10 am– 01:00pm	Morning Session-I	Prof. Nehad Ali Shah Prof. Carla M. A. Pinto Prof. Yogendra Kumar Mishra Prof.ShamsForruque Ahmed Prof. Praveen Agarwal
Time	**Keynote/Invited Speaker**	**Presentation Titles**
09:10am – 09:40am	Keynote Talk- 4 Prof. Martin Bohner	Hyers-Ulam and Hyers-Ulam-Rassias Stability of First-Order Linear and Nonlinear Dynamic Equations
10:00am – 10:15am	Invited Talk-9 Prof. Mani Mehra	Machine learning of fractional differentialequations
10:15am – 10:30am	Invited Talk-10 Prof. Rajesh Kumar	PC-GNN for limb activity recognition
10:30am – 10:45am	Invited Talk-11 Prof. JyotindraPrajapati	Volterra Integral Equation and its solution
10:45am – 11:00am	Invited Talk-12 Prof. DhananjayGopal	On The Topology of non-triangular metric spacesand related fixed point results
11:00am – 11:15am	Invited Talk-13 Prof. GrienggraiRajchakit	An application of neural networks for traffic problems
Between Hours	**Activity Name**	**Session Chair**
11:15am – 01:00pm	Morning Session-II	Prof. Martin Bohner Prof. Mani Mehra Prof. GrienggraiRajchakit Prof. Amit Kumar Verma Prof. BhavanaMathur
Time	**Keynote/Invited Speaker**	**Presentation Titles**
11:15am – 11:30am	Invited Talk-14 Prof. Nehad Ali Shah	Effects of generalized thermal transport on the unsteady convective flows over a vertical cylinder with time-dependent temperature
11:30am-11:45am	Invited Talk-15 Prof. Wen-Feng Wang	Understanding the structure of a machine brain
11:45am-12:00am	Invited Talk-16 Prof.ShamsForruque Ahmed	Physical, hybrid and data-driven modeling techniques of Earth-air heat exchangers for reducing building energy consumption
12:00pm-01:00pm	Paper Presentation Parallel Sessions	GOOGLE MEET LINK: Parallel Session A: https://meet.google.com/udq-dqcv-pac Parallel Session B: https://meet.google.com/jqh-xidv-ecz
01:00pm-01:30pm	LUNCH	
Between Hours	**Activity Name**	**Session Chair**
01:30 pm– 04:00pm	Evening Session	Prof. DumitruBaleanu Prof. Valentina E. Balas Prof. Carla M. A. Pinto Prof. Praveen Agarwal Prof. BhavanaMathur
Time	**Keynote/Invited Speaker**	**Presentation Titles**
02:00 pm– 02:30pm	Keynote Talk-5 Prof. Carlo Cattani	Haar Wavelet Fractional Derivative
02:30 pm– 02:45pm	Invited Talk-17 Prof. HemenDutta	An introduction to functional equations and their stability analysis
02:45 pm– 03:15pm	Keynote Talk-6 Prof. Yogendra Kumar Mishra	Tetrapods based Smart Materials for AdvancedTechnologies
03:15 pm– 03:45pm	Valedictory Session	

Hybrid

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Jointly organized by

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ANAND INTERNATIONAL COLLEGE OF ENGINEERING

PAPER PRESENTATION SCHEDULE

Day-1, 25.02.2022-Friday		
GOOGLE MEET LINK: **Parallel Session A:https://meet.google.com/udq-dqcv-pac** **Parallel Session B: https://meet.google.com/jqh-xidy-ecz**		
Between Hours	**Activity Name**	**Session Chair**
11:30 am to 12: 30 pm	**Parallel Session A**	**Prof. Praveen Agarwal** **Prof. BhavanaMathur** **Er. PramilSinha** **Prof. SanjanaChugh**
Time	**ICRDET Paper Id**	**Presentation Titles**
11:30 am -11:35 am	**ICRDET-2022-1001**	**Analyzing Mathematical Models of Tumor Growth**
11:35 am -11:40 am	**ICRDET -2022-2001**	**Replacement of Fine aggregates in Concrete_A study on various Agro-wastes**
11:40 am -11:45 am	**ICRDET-2022-1002**	**New abundant exact solutions for MCBS-nMCBS**
11:45 am -11:50 am	**ICRDET -2022-2002**	**Structure Strength Check and Repair Technique of RCC Structures**
11:50 am -11:55 am	**ICRDET-2022-1017**	**SVMBH:Support Vector Machine Based Hate Speech Detection in COVID-19 Era.**
11:55 am -12:00 noon	**ICRDET -2022-2003**	**An Integration of Taguchi's approch and artificial neural network in parametric optimization and prediction of harness value of stir casted AL 6063 reinforced with Sic**
12:01 pm-12:05 pm	**ICRDET-2022-1004**	**Monitoring the CO2 level indoors and determining the need for ventilation**
12:05 pm-12:10 pm	**ICRDET -2022-2004**	**CCTV Image Authentication using Digital Watermarking**
Between Hours	**Activity Name**	**Session Chair**
11:30 am to 12: 30 pm	**Parallel Session B**	**Prof. Praveen Agarwal** **Prof. BhavanaMathur** **Er. Shiv Kr. S** **Er. VivekBhojak**
Time	**ICRDET Paper Id**	**Presentation Titles**
11:30 am -11:35 am	**ICRDET-2022-1005**	**Dynamical transmission of fractional-order SEIQRD model of COVID-19**
11:35 am -11:40 am	**ICRDET -2022-2005**	**Optimization of Process Parameters of Friction Stir Welding of Two Dissimilar Mg alloys like AZ31 and AZ91**
11:40 am -11:45 am	**ICRDET-2022-1006**	**Solution of non-linear fractional partial differential equations using homotopy analysis.**
11:45 am -11:50 am	**ICRDET -2022-2006**	**A mathematical study on the polymerization shrinkage and its effect on dental restorative material.**
11:50 am -11:55 am	**ICRDET -2022-2007**	**A Comparative Study on thermodynamics properties of Se-Te- Zn and Se-Te-Ag Ternary Chalcogenide Glasses**
11:55 am -12:00 noon	**ICRDET-2022-1007**	**The Appraisal of the Engineering Properties of Gravel from Some Selected Locations in Southwestern Nigeria for Concrete Production**
12:01 pm-12:05 pm	**ICRDET -2022-2008**	**Integral representation of mathieu-type series associated with extended hypergeometric functions**
12:05 pm-12:10 pm	**ICRDET-2022-1008**	**Distance Measure for Triangular Fuzzy Numbers in University Selection under TOPSIS Environment**

Day-1, 25.02.2022-Friday		
GOOGLE MEET LINK: Parallel Session A:https://meet.google.com/udq-dqcv-pac ParallelSession B: https://meet.google.com/jqh-xidy-ecz		
Between Hours	**Activity Name**	**Session Chair**
02:45 pm to 3:45 pm	Parallel Session A	Prof. Praveen Agarwal Prof. BhavanaMathur Prof. Sushmita Sharma Mr. SandeepJaiman
Time	**ICRDET Paper Id**	**Presentation Titles**
02:45 pm to 02:50 pm	ICRDET -2022-2009	A Study on "Environment Friendly Concrete"
02:50 pm to 02:55 pm	ICRDET-2022-1009	Multi-objective Newsboy problem with random fuzzy demand
02:55 pm to 03:00 pm	ICRDET -2022-2010	Design and Simulation of C2N based solar cell by SCAPS-1D
03:00 pm to 03:05 pm	ICRDET-2022-1010	Scaffolds for tissue engineering applications: a review
03:05 pm to 03:10 pm	ICRDET-2022-1011	COVID-19 spread prediction using modified SIRD model for districts of Rajasthan.
03:10 pm to 03:15 pm	ICRDET -2022-2011	UPVC Compression Members Behaviouras Double Skin Tubular
03:15 pm to 03:20 pm	ICRDET-2022-1012	A Novel Approach Based On ChipHighSpeed OpticalTransreceiver using 1cm length Optical Fiber
03:25 pm to 03:30 pm	ICRDET -2022-2012	Optical gain investigation of nano scale heterostructureGaInP/AlGaInP red laser
Between Hours	**Activity Name**	**Session Chair**
02:45 pm to 3:45 pm	Parallel Session B	Prof. Praveen Agarwal Prof. BhavanaMathur Mr. Prashant Joshi Ms. RiddhiBhardwaj
Time	**ICRDET Paper Id**	**Presentation Titles**
02:45 pm to 02:50 pm	ICRDET-2022-1013	A comprehensive review of various attacks in Mobile Ad Hoc Networks.
02:50 pm to 02:55 pm	ICRDET -2022-2013	An audio Steganographic technique based on Vedic numeric code
02:55 pm to 03:00 pm	ICRDET -2022-2014	Analyzing a Flexible Pavement with IIT-Pave As per IRC: 37:2018
03:00 pm to 03:05 pm	ICRDET-2022-1014	Tumor Detection Using CNN Based Neural Network
03:05 pm to 03:10 pm	ICRDET -2022-2015	Electric vehicles: an alternative to conventional vehicles
03:10 pm to 03:15 pm	ICRDET-2022-1015	Numerical Prediction of the Pull-Out Resisting Capacity of Granular Pile Anchor
03:15 pm to 03:20 pm	ICRDET-2022-1016	Unwillingness for Vaccination in India: Real-Life Data Application with Queueing Analysis of Covid-19 Model
03:25 pm to 03:30 pm	ICRDET -2022-2016	Power Quality Improvement using Active Power Filter.
03:30 pm to 03:36 pm	ICRDET -2022-1023	Bianchi Type V Magnetized Stiff Fluid Models in Lyra Geometry

Hybrid
3rd International Conference on Recent Developments in Engineering and Technology
(ICRDET-2022)
February 25 - 26, 2022
Jointly organized by
Rajasthan Technical University, Kota
&
Anand International College of Engineering, Jaipur

ANAND INTERNATIONAL COLLEGE OF ENGINEERING

PAPER PRESENTATION SCHEDULE

Day-2, 26.02.2022 Saturday

GOOGLE MEET LINK:
Parallel Session A:https://meet.google.com/udq-dqcv-pac
Parallel Session B: https://meet.google.com/jqh-xidy-ecz

Between Hours	Activity Name	Session Chair
12:00 pm to 01:00 pm	Parallel Session A	Prof. Praveen Agarwal Prof. BhavanaMathur Prof. Anil Dhawan Er. VivekBhojak
Time	**ICRDET Paper Id**	**Presentation Titles**
12:00 pm to 12:05 pm	ICRDET-2022-1003	Comparative Analysis of Live Migration Methodologies
12:05pm to 12:10 pm	ICRDET -2022-2017	A Review on Recycling Plastic Waste into Sustainable, Valuable and Useful Products
12:10pm to 12:15 pm	ICRDET-2022-1018	Urgent Vacation Strategy for Discrete-time Retrial Queue with Bulk Arrivals
12:15 pm to 12:20 pm	ICRDET -2022-2018	A Review of Applications of Biopolymeric Membranes in Removal of Organic Pollutant and Micro pollutantsfrom Wastewater.
12:20 pm to 12:25 pm	ICRDET-2022-1019	On A-Fractional Analysis
12:25pm to 12:30 pm	ICRDET-2022-2019	Chronological Review of Electrical Vehicle Technology
12:30 pm to 12:35 pm	ICRDET -2022-2020	A Review Paper on Performance analysis of Mobility adaptive Slotted CSMA/CA MAC protocol for Mobile IEEE802.15.4 Wireless Sensor Networks
12:35 pm to 12:40 pm	ICRDET -2022-2021	A Review on Transmission Line Protection Schemes
12:40pm to 12:45 pm	ICRDET -2022-1022	Dynamical Modelling Analysis using Different materials of Capacitive Pressure Sensor Applications

Between Hours	Activity Name	Session Chair
12:00 pm to 01:00 pm	Parallel Session B	Prof. Praveen Agarwal Prof. BhavanaMathur Er. Shiv Kr. S Er. NeerajMangalani
Time	**ICRDET Paper Id**	**Presentation Titles**
12:00 pm to 12:05 pm	ICRDET -2022-2022	Role of nanoscience and nanotechnology in improving the efficiency of solar cell - graphene sheets in solar cell.
12:05pm to 12:10 pm	ICRDET -2022-2023	Fractional integrals using generalized Bessel Function associated with generalized fractionalCalculus operators
12:10pm to 12:15 pm	ICRDET-2022-1020	On equality of inner automorphisms group with different automorphism group
12:15 pm to 12:20 pm	ICRDET-2022-2024	Mathematical Modelling and Analysis of Diesel-BiodieselEthanol blends and Tio2 Addition effects into the Combustion and Emissions Characteristics in CI Engine
12:20 pm to 12:25 pm	ICRDET -2022-2025	Study of Mechanical Poperties of Stir Casted Al 6063 Alloy Reinforced with Fly ash
12:25pm to 12:30 pm	ICRDET-2022-1021	Generalized fractional Integral formulas involving the product of hypergeometric functions and Fox's H-functions
12:30 pm to 12:35 pm	ICRDET-2022-2026	Impact of Various Combustibles on Refractory Brick Thermal Insulation
12:35 pm to 12:40 pm	ICRDET-2022-2027	Performance Analysis of Wire Electric Discharge Machining on D-3 Die Material byArtificial Neural Network
12:40pm to 12:45 pm	ICRDET-2022-2028	Noise Detection and Removal Filtering Techniques in Medical Image

Abstracts of Plenary Talks

Artificial Intelligence and Exact Deep Learning Machines

Arni S.R. Srinivasa Rao

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In this talk, an overview of latest developments and achievements in the research on AI will be described. Author's work on Exact Deep Learning Machines (EDLMs) will be explained.

Phase Trajectory Qualitative Analysis and Applications

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The talk presents a soft computing identification method of the operating regimes for controllers based on the qualitative analyze of the phase trajectory of the error. The control of highly non-linear and time variable systems demands high quality self-adaptation. Even we dispose of valid mathematical models for the controlled plants, the adaptation strategy is inspired by the classic methods from linear control, like the operational calculus. In most of the real applications we don't have valid knowledge about the controlled plant and its mathematical model, their physical parameters are varying in time and unpredictable external perturbations may occur. In such cases, the only possible approach that can be always used is the heuristic one. We propose the phase trajectory of the error as the basic tool able to support the on-line heuristic adaptive action. The judgments standing behind the proposed method will be answers to the basic question: "how would a human operator control and adapt an unknown plant?".

Fractional Generalised Operators With Applications: A Point Of View

Dumitru Baleanu

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Fractional calculus is an emerging field of mathematics even after 326 years since it was initiated. Among several new direction within this field one is focusing on finding fractional generalised operators with high potential impact for applications in treating the dynamics of complex systems. In my talk I will discuss some new classes of general operators and I will apply them to solve some real world applications.

Haar Wavelet Fractional Derivative

Carlo Cattani

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In this lecture the fundamental properties of fractional calculus are discussed with the aim to extend the definition of fractional operators by using wavelets. The Haar wavelet fractional operator is defined, in the more general form, independently on the kernel of the fractional integral.

Tetrapods based Smart Materials for Advanced Technologies

Yogendra Kumar Mishra

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Considering the size dependent utilization complexities of nanoscopic dimensions towards real applications, the focus of nanomaterials community is merging to three-dimensional (3D) form of materials which are built out interconnected nanostructures. This talk will briefly introduce the importance of complex shaped nanostructures towards smart 3D nanomaterials structuring. A simple flame based single step approach was developed for synthesizing zinc oxide tetrapods which demonstrated many applications in different technologies. These tetrapods have been used as building blocks to construct highly porous interconnected 3D nanonetworks in form of flexible ceramics which offer further new application avenues. Additionally, these 3D networks have been utilized as sacrificial templates to develop hollow tetrapodal 3D networks from almost any desired material, carbons, nitrides, oxides, polymers, hydrogels, etc. The sacrificial template-based strategy offers new and unique opportunities in the direction of 3D nanomaterials engineering and accordingly advanced technological applications. Some examples of 3D nanomaterials engineering will be demonstrated alongwith their applications [1-10]. The scopes of 3D nanostructuring based smart materials in sensing, electronics, optoelectronics, energy, and biomedical engineering will be briefly highlighted in the talk.

Hyers-Ulam and Hyers-Ulam-Rassias Stability of First-Order Linear and Nonlinear Dynamic Equations

Martin Bohner

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We present several new sufficient conditions for Hyers–Ulam and Hyers–Ulam-Rassias stability of first-order linear and nonlinear dynamic equations for functions defined on a time scale with values in a Banach space.

The CESTAC Method to Validate the Results of Volterra Integral Equations Arising in the Load Leveling Problem

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Abstract The aim of this study is to discuss application of the CESTAC method and the CADNA library to control the accuracy of the Adomian decomposition method and the homotopy perturbation method to solve the linear and nonlinear Volterra integral equations with discontinuous kernel. The importance of solving this problem is be- cause of its applications in the load leveling problems, energy storage with renewable and diesel generation, charge/discharge storages control and others. In general, the mathematical methods for solving the mentioned problem are based on floating point arithmetic and the accuracy of the method has been discussed using the traditional absolute error which depends on the exact solution and also a positive small valueϵ. But in real life problems we do not have the exact solution. Also, based on this condition we will not be able to find more accurate approximations because we do not have information about optimal ϵ. For small values of ϵ, the numerical algorithm can not be stopped and extra iterations will be produced without improving the accuracy. For large values of ϵ, the numerical algorithm will be stopped in initial steps without producing enough iterations. Because of the mentioned problems we apply a new termination criterion which depends on two successive approximations. For this aim we apply the CESTAC method and the CADNA library which are based on stochastic arithmetic. In this condition, not only we do not need to have the exact solution but also we would be able to identify the optimal approximation, optimal iteration and optimal error of numerical procedure. Also, the CADNA library is applied as an important software for this validation. The CADNA library should be done on the LINUX operating system and its codes should be written using C, C++ or ADA codes.

Some new existence results for a class of nonlinear SBVP arising epitaxial growth

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Thin films are used in many structures like high-performance RF devices, microwave ICs, solar cells, and many electronic instruments like lasers, diodes, bipolar transistors. The epitaxial growth technique produces these thin films under high vacuum conditions from the crystal in the semiconductor industry. This talk focuses on a fourth-order nonlinear singular boundary value problem that models Epitaxial growth. The existence of solutions will be discussed. We also discuss how depending on a parameter, existence can fail.

Digital Indology. Some remarks and suggestions

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The paper deals with the research and discussions concerning the active employing the digital instruments and programs in the near-future studies of the Indian intellectual tradition. The term "Digital Indology", we use here this term by analogue with the term "Digital Humanities", in the field of the philosophy means investigation of the philosophical textual tradition of Ancient and Medieval India with the using of the digital technology, mathematic statistics, contextual analysis methods and the traditional approaches of the Humanities. The main trends of elaborating the Digital Philosophical Indology (creating the Open Data of Indian Philosophy, elaborating the special programs for 'reading' the various Indian shrifts, application of the new methods of analysis of the philosophical texts with the use of digital technologies) are expounded. As the basic methods of analysis of the philosophical texts of India we consider the method of mathematical statistics and the method of contextual analysis. The hidden dangers of using the digital technologies for academical sphere of studies in general and for the intellectual tradition of India in particularly are taken into consideration: sociological intervention, mathematization of the results, minimization of the role of the philosophizing interpretation. The conclusion of such a brief manifest of the Digital Philosophical Indology is declaration of it only as an instrument for the classical Indological studies, which has its own philosophical tasks and aims.

Machine learning of fractional differential equations

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We introduce a machine learning framework that uses the differential evolution algorithm in combination with Adam–Bashforth–Moulton method to learn the parameters in a system of variable order fractional differential equations. In this work, we present out developments with regards to taking care of a class of problem: data-driven discovery of system of variable order fractional differential equations.

Asymptotic of orthogonal polynomials and their associated Mechanical systems

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We present a formulation of quantum mechanics based on the theory of orthogonal polynomials. The wave function is expanded over a complete set of square integrable basis where the expansion coefficients are orthogonal polynomials in the energy and physical parameters. Information about the corresponding physical systems (both structural and dynamical) are derived from the properties of these polynomials. We demonstrate that an advantage of this formulation is that the class of exactly solvable quantum mechanical problems becomes larger than in the conventional formulation. We limit our investigation in this work to the Askey classification scheme of hypergeometric orthogonal polynomials and focus on the Wilson polynomial and two of its limiting cases (the Meixner-Pollaczek and continuous dual Hahn polynomials). Nonetheless, the formulation is amenable to other classes of orthogonal polynomials.

An application of neural networks for traffic problems

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Traffic congestion is a thorny issue to many large and medium-sized cities, posing a serious threat to sustainable urban development. Recently, intelligent traffic system (ITS) has emerged as an effective tool to mitigate urban congestion. The key to the ITS lies in the accurate forecast of traffic flow. However, the existing forecast methods of traffic flow cannot adapt to the stochasticity and sheer length of traffic flow time series. To solve the problem, this paper relies on deep learning (DL) to forecast traffic flow through time series analysis. The authors developed a traffic flow forecast model based on the bidirectional Long Short-Term Memory Recurrent Neural Network (BLSTM-RNNs) with delay. The proposed model was compared with two classic forecast models, namely, the autoregressive integrated moving average (ARIMA) model and the Long Short-Term Memory Recurrent Neural Network (LSTM-RNNS) model, through long-term traffic flow forecast experiments, using an actual traffic flow time series from OpenITS. The experimental results show that the proposed BLSTM-RNNs network outperformed the classic models in prediction accuracy. Our research discloses the dynamic evolution law of traffic flow and facilitates the decision-making of traffic management.

Latent reservoir replenishment by pyroptosis and superinfection in a HIV transmission model

Carla M.A. Pinto

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We study the role of pyroptosis and super infection on the maintenance of the human immunodeficiency virus (HIV) latent reservoir on infected patients. The proposed model is simulated for biological meaningful parameters and interesting patterns are found. Our results are interpreted for clinical appreciation.

PC-GNN for limb activity recognition

Rajesh Kumar

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In various domains of science and engineering, such as computer vision, molecular chemistry, molecular biology, pattern recognition, and data mining, graphs may be used to show many underlying relationships among data. Graph Neural Networks (GNN) not only gathers individual information, but also uses data from other samples to create a graph. Graph neural networks are a type of information processing system that operates by sending messages between graph nodes. GNN variations such as the graph attention network (GAT), graph convolutional network (GCN), and graph recurrent network (GRN) have showed revolutionary performance in deep learning and artificial intelligence applications in recent years. Based on the problems it addresses, GNN may be classified into three categories: link prediction, node classification, and graph classification. The proposal is on design of a new Pearson Correlation based Graph Neural Network (PC-GNN) and to categorize human lower limb activity recognition.

Physical, hybrid and data-driven modelling techniques of Earth-air heat exchangers for reducing building energy consumption

Shams Forruque Ahmed

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The development of Earth-Air Heat Exchanger (EAHE) models to reduce building energy use has been notable for the last several decades.However, selecting and executing the most effective EAHE modelling technique in buildings is still a difficulty due to climate, performance, and modelling technique limitations.This paper discusses the available research on several EAHE modelling techniques, including physical, data-driven and hybrid approaches for building applications.Unmeasured disturbances, assumptions, or uncertainties induced in experimental and numerical research of all EAHE modelling methodologies are also discussed.It is demonstrated that hybrid modelling outperforms data-driven and physical models for accurate prediction.However, if EAHE operational circumstances and all essential parameters are included during model building, hybrid models suffer from high complexity.In terms of generality, physical models outperform hybrid and some data-driven models.In addition, a small number of training data is required for physical models, while medium and high numbers are required for hybrid and data-driven models.

Mathematical models of non-local interaction

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Fractional calculus is important because it allows to describe non-local interac- tions. In this talk, we mathematically discuss two particular possibilities to take non-local interactions into account. In the first part, we analytically discuss for a bounded C^2 domain $\Omega \subset R^N$ the semilinear elliptic PDE

$-\triangle u + c(,u) = 0$ in Ω with nonlinearity $c(x,u) := \int_{\partial\Omega} b(x,y,u)dS(y)$

subject to nonlocal integral Neumann boundary conditions [1]

$\frac{\partial d}{\partial \vec{n}} = Iu$ on $\partial\Omega$ with $\int_{\partial\Omega} b(x,y,u(x))dx$

modelling non-local interactions between interior points and boundary points. In the case where the state-dependent kernel $b : \Omega \times \partial\Omega \times R \longrightarrow R$ is singular, i.e. where $b(x,y,u)$ blows up for $\Omega \ni x \to y \in \partial\Omega$ so fast that $b(x,y,u) \notin L^1(\Omega \times \partial\Omega)$ for fixed $u \in R$, we prove uniqueness of solutions by invoking duality to linear elliptic PDEs with fractional divergence as lower order term [2]. In the second part, we consider in contrast to local finite element methods for the numerical solution of elliptic PDEs the spectral Bernstein dual Petrov-Galerkin method on a cube Ω [3]. To use Bernstein polynomials as non-localized basis functions has some advantages, and we particularly aim to discuss positivity of solutions for non-negative non-zero data [4].

A study of turbine failure pattern – a model optimization using Machine Learning

Bhaskar Roy

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With the growing demand of electricity worldwide, most of the power generation companies focus on long-term and cost-effective asset operation and maintenance strategies to reduce their unplanned downtime which is their main cost driver. Power generating companies are trying to make their commercial process smart and agile enough to do proactive equipment assessment and failure identification in advance rather than taking corrective actions after an event. A turbine failure occurs when a turbine unexpectedly stops producing power due to malfunctioning or break-down of the key components. This creates a complete shutdown of the power generation process and disruption in power generation. To keep these operational, it is extremely important to have a robust asset reliability and failure prediction models which can pro-actively help these companies to manage their operation and maintenance costs optimally. In this paper, we have studied the failure pattern of turbines after fitting most commonly used single distribution (such as Weibull, gamma and log-normal) and also composite and mixed distributions by the help of machine learning tools to forecast asset failure patterns more accurately. The paper finally compares between single distribution model fitting with composite and mixed distribution model fitting. The numerical illustration is based on historical failure data of 2470 turbines. More importantly, if more than one suitable model exists, the same can be mathematically combined to get a joint forecast model to forecast failure pattern which is found better than single distribution applied separately. Finally, these predictive methods could be applied to a power generating company for the failure forecast of its assets and to identify upcoming commercial action in advance.

Analytical and Numerical Methods in Modelling Riesz Fractional Nonlinear Schrödinger Equation in Quantum Mechanics

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Analytical and numerical methods for solving the one-dimensional Rieszspace fractional Schrödinger equation are presented in thecase of a particle moving in a potential field. The fractional derivative is defined by the quantum Riesz fractional derivative. In this respect, a nonlinear Schrödinger equation with the Riesz fractional derivative has been considered. This equation has been solved by two reliable methods in order to investigate the accuracy of the solutions. In the implicit finite difference numerical scheme, the fractional centered difference is utilized to approximate the Riesz fractional derivative. Also a novel modified optimal homotopy asymptotic method with Fourier transform (MOHAM-FT) has been proposed to compute the approximate solution of Riesz fractional nonlinear Schrödinger equation. Further the numerical solutions obtained by proposed implicit finite difference method, have been compared with that obtained by MOHAM-FT to exhibit the effectiveness of the suggested methods. Finally, the obtained solutions have been presented graphically to justify the efficiency of the methods.

Volterra Integral Equation and its solution

Jyotindra Prajapati

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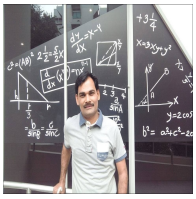
Volterra Integral Equation plays an important role in Mathematical Sciences/Mathematical Physics. Laplace transform, Inverse Laplace Transform and their various properties used as a tool to discussed solution of Volterra Integral Equation.

On The Topology of non-triangular metric spaces and related fixed point results



Dhananjay Gopal

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Non-triangular metric spaces have been introduced by Khojasteh and Khandani ([13]) in 2020. The concept of non-triangular metric spaces is fresh and therefore, requires quite some analysis on its topology. In this talk, we shall discuss about the topology of non-triangular metric spaces by giving a natural definition of open sets in this context. The introduction of non-triangular metric spaces has shown that there is no inherent need for the triangle inequality to prove various fixed point results. Keeping this in mind, we give a fixed point result for Suzuki type Z-contractions in the context of non-triangular metric spaces by introducing a new property of maps. We also see the scope of further work on this topic.

Effects of generalized thermal transport on the unsteady convective flows over a vertical cylinder with time-dependent temperature

Nehad Ali Shah

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An analysis is made for the generalized transient convective flows over an infinite, vertical, heated circular cylinder. The generalization considers a new form of the constitutive equation of the thermal flux based on the generalized time-fractional derivative with Mittag-Leffler kernel, called the generalized Atangana-Baleanu derivative.Closed forms of the analytical solutions for the temperature and velocity fields, expressed with Bessel and Struve functions, are determined using the Laplace transform and the Weber-Dirichlet transform.The solutions obtained for the generalized case are suitable for particularizations to give solutions corresponding to fractional derivatives with power-law kernel and exponential kernel. The ordinary case corresponding to classical Fourier's law is also obtained.Numerical simulations obtained with the software Mathcad are carried out and graphically illustrated in order to compare models based on generalized Atangana-Baleanu, Atangana-Baleanu, Caputo, and Caputo-Fabrizio time-fractional derivatives.

Understanding the structure of a machine brain

Wen-Feng Wang

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This article explains the reason why we interpret the structure of a machine brain as a five-layer intelligence. First, we review the physiological structure of the human brain. About 80% of a human brain are water, and the others are complex biochemical structures. It is almost impossible to simulate the physiological structure of the human brain. Second, we analyze the functional mechanisms of the human brain, including a preliminary understanding of the connections between neurons in the brain. The role of synapses is also discussed. It is possible to simulate the learning mechanisms of a human brain. Finally, we present a framework to carry out such simulation by summarizing the current level of machine intelligence as a "five-layer intelligence". Explicit functional mechanisms and practical examples of the five intelligence layers, along with trends in machine intelligence and the role of nonlinear science, are also further interpreted.

An introduction to functional equations and their stability analysis

Hemen Dutta

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This talk is about functional equations, or the search for functions that satisfy certain functional relationships. We will go through some essential aspects of functional equations with examples and applications. We will also go over the stability of functional equations briefly. The primary goal of the talk is to stimulate the interest of students and new researchers in the area of functional equations.

Abstracts of Oral Presentation

[ICRDET-2022-1001]

Analyzing Mathematical Models of Tumor Growth and their Applications

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Cancer is a spontaneous, organic change marked by genetic alterations that lead to tumor growth, clinical progression, immune evasion, and the evolution of chemoresistance. Mathematical models of tumor growth have been reviewed in this paper. Mathematical equations were constructed using ordinary differential equations (ODEs), partial differential equations (PDEs), and discrete modeling features to model the tumor cell's growth rate. The stochastic Gompertz model is better suited for evaluating experimental results than the stochastic logistic model. Also PDEs estimate the long-term change in the total tumor cell population and the discrete models analyze actions at the scale of individual cells over continuum models. A summary of the major study problems is given, and a rationale is provided for the conclusion.

[ICRDET-2022-1002]

New abundant exact solutions for MCBS-nMCBS equation: Painlevé analysis and auto-Bäcklund transformation

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This article considers a (2+1)-dimensional variable coefficients combined modified Calogero-Bogoyavlenskii-Schiff equation and negative-order modified
Calogero-Bogoyavlenskii- Schiff (MCBS-nMCBS) equation. First in this article, the integrability of the considered equation is being examined by the Painlev´e analysis method. It has been proved that the considered equation is completely integrable. Further, two ABTs are being generated with the help of Painlev´e analysis. Two analytic solution families have been generated by using the ABT method. The kinksoliton, anti-kink soliton, bright-soliton and dark-soliton solutions are being obtained successfully for the variable-coefficient MCBSnMCBS equatiopn by using the ABT method. The physical importance of the equation are being expressed by the threedimensional graphs.

[ICRDET-2022-1003]

Comparative Analysis of Live Migration Methodologies

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Cloud computing is a burgeoning breakthrough in the IT business right now. By providing its services, cloud computing allows the IT industry to drastically reduce its infrastructure costs. Virtualization is one of their primary services via which cloud computing achieves its goals, and live migration in virtual machines provides numerous benefits such as fault tolerance, management, and increased productivity by minimising machine downtime. A key element of virtualization systems is live migration, which allows a running Virtual Machine (VM) from one physical host to be moved to another without causing any service interruptions. Higher availability, load management, energy conservation, and disaster recovery are undeniably the benefits acquired from VM migration, which are their ideal information centre qualities. During the VM migration process, data from the CPU, RAM, and storage is moved, and we determine the type of data that has to be transmitted in each situation. We provide a quick overview of security concerns in live VM migration and classify them into three groups (control plane, data plane, and migration module). We also go through the security needs and available options for preventing assaults.

Specific flaws are noted, as well as the research hurdles involved in enhancing the performance of live VM migration. The importance of this study is that it provides a background on live VM migration strategies as well as an in-depth evaluation that will enable cloud professionals and researchers better understand the issues and propose appropriate solutions.

[ICRDET-2022-1004]

Monitoring The Co2 Level Indoors And Determining The Need For Ventilation

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Along with the pandemic process that has been effective all over the world, the duration of indoor environment use has increased significantly. In parallel, the spread of viruses in the environment and the transmission of them to humans began to emerge as a serious problem. In this study, analyses and evaluations were made about air quality and the need for ventilation depending on the CO2 level for indoor spaces. In this context, long-term CO2 measurements were made in different indoor areas. The obtained data were used to analyze the state of virus spread in closed spaces and, accordingly, to determine the need for ventilation. It has been revealed by the study that the natural ventilation applied in closed spaces that cannot have a ventilation system does not work very much and that there is a serious need for ventilation both in terms of health and cleanliness.

[ICRDET-2022-1005]

Dynamical transmission of fractional-order SEIQRD model of COVID-19

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In this paper, we have studied a covid-19 dynamical transmission model of a coupled non-linear fractional differential equation in the Atangana-Baleanu Caputo sense. The basic dynamical transmission properties of the proposed model are brie y discussed. The qualitative as well as quantitative results on the existence and uniqueness of the solutions are evaluated through the fixed point theorem. The stability analysis of the proposed model in the sense of Ulam-Hyers is furnished. Numerical analysis work is performed via the Adams-Bashforth-Moulton method.

[ICRDET-2022-1006]

Solution of non-linear fractional partial differential equations using homotopy analysis fractional complex transform method

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Homotopy analysis fractional complex transform method(HAFCTM) to examine various non-linear fractional partial differential equations. The acquired results are presented in the form of tables and graphs. The numerical results show that the suggested approach is reliable, with a short processing time and good precision. Also, Comparative tests have been conducted to demonstrate that the proposed methodology agrees well with existing methods in the literature. HAFCTM is a well-proven suggested algorithm that provides approximate solutions in a short amount of time while maintaining excellent accuracy.

[ICRDET-2022-1007]

The Appraisal of the Engineering Properties of Gravel from Some Selected Locations in Southwestern Nigeria for Concrete Production

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Gravel is a naturally occurring granular deposit that is used as coarse aggregate in concrete production. It is perceived by many as not being as strong as granite and as such its use is limited. However, with the high cost of granite and the fact that it is readily available in some parts of South Western Nigeria where granite is scarce and the cost of transportation additionally prohibitive, the use of gravel becomes inevitable. This study examines the physical and mechanical properties of gravel with the aim of determining its suitability for concrete production. In the study, laboratory tests were carried out to determine the gradation, specific gravity, water absorption, moisture content, aggregate impact, abrasion, and crushing values. Results of the tests indicate that the gradation of almost all the samples is poor. Furthermore, the range of values of specific gravity, water absorption, moisture content, aggregate impact, abrasion, and crushing values are 2.71 – 2.9, 0.52 – 8.26,0.65.1.96, 28.6 – 51.3, 23.33 -52.92, and 5.2 – 24.8 respectively. From the results obtained, apart from the gradation of the aggregates that exceeds the limit in the lower sieve sizes, most of the samples are suitable for use as coarse aggregates in concrete production for most of the other physical and coarse aggregates.

[ICRDET-2022-1008]

Distance Measure for Triangular Fuzzy Numbers in University Selection under TOPSIS Environment

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In everyday life, humans make numerous deci-sions on various fronts. Frequently, these decisions are made based on several factors, some of which are explicit, whereas some of them are vague and not precise. These lead to certain challenges while making decisions, to deal with which, Multi-Criteria Decision Making (MCDM) techniques have been developed. The goal of this article is to provide a means to rank and hence select a university for admission for students, using Fuzzy Technique for Order of Preference by Similarity to Ideal Solu-tion (FTOPSIS) method. A novel distance measure has been proposed, for the same. Some axiomatic properties have also been proved. To aid in the process of university selection, the suggested work enables ranking of universities based on certain criteria in fuzzy environment. The results suggest that the pro-posed model provides a realistic way to select the best university among the pool of considered universities. The paper concludes with a discussion of a case study and experimental results.

[ICRDET-2022-1009]

Multi-objective Newsboy problem with random fuzzy demand

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During the past few years, the whole country is very much worried about the greenhouse gasses releases that are warming the earth. In response to this, a single-period multi-objective inventory problem is formulated under uncertainty for perishable goods. The aim is to maximize the expected profit as well as minimize the total carbon emission. Due to increasing difficulty and challenging issues newsboy problem under uncertain environment, we assumed the demand for the product is random-fuzzy variables.

Credibility theory is used to formulate the crisp equivalent form of the random-fuzzy variable. Since the developed model of the problem is NP-hard, the multi-objective evolutionary algorithm multi-objective particle swarm optimization (MOPSO) is proposed to solve the problem. Besides, since no benchmark is available in the literature to verify and validate the results obtained, a non-dominated sorting genetic algorithm-II (NSGA-II) is suggested to solve the problem. Then, the performances of the two algorithms are compared in terms of some multi-objective performance measures and showed that the MOPSO is better choice for solving our proposed model. Finally, we have perform a sensitivity by changing the uncertainty parameter which will help the decision maker to put his order depending on his/her demand.

[ICRDET-2022-1010]

Scaffolds for tissue engineering applications: a review

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Additive manufacturing (AM) is widely used to produce intrinsic 3D structures with high accuracy. The use of additive manufacturing technique has increased significantly in tissue engineering (TE) over the years. TE is used to repair and regenerate impaired tissues caused by trauma, disease, and injury by fabricating scaffolds. Various materials like polymers, ceramics, and composites provide immense potential for producing scaffolds. The major challenge in manufacturing these bioactive and patient-specific scaffolds has been to control the architecture and the pore size for cell proliferation and adhesion. The traditional techniques are not efficient enough for meeting the requirements of the scaffolds. The AM technology can produce the desired pore distribution and the pore size. Hence, the AM technology is being employed for the development and fabrication of TE scaffolds. This review focuses on various methods used for printing scaffolds like stereolithography (SLA), selective laser sintering (SLS), fused deposition modeling (FDM), and binder jetting (BJ). This work also reviews various materials used for the fabrication of scaffolds for tissue engineering. It discusses the advantages of those materials, and various applications of those materials for TE scaffolds. This work also deals with the effect of scaffold geometry on various scaffold properties like mechanical properties, porosity and proliferation.

[ICRDET-2022-1011]

COVID-19 spread prediction using modified SIRD model for districts of Rajasthan

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COVID-19, a coronavirus disease caused by SARS-CoV-2, was discovered in December 2019. The first incidence of COVID-19 was reported in India on January 30. The Government has initiated various government interventions to stop the spread of COVID-19. Several researchers have implemented compartmental models to identify and analyze the effect of different government measures such as lockdown, social distancing, wearing masks, home isolation, etc. In this research, we present a modified Susceptible-Infected-Recovered-Deceased (SIRD) model to assess the impact of various government initiatives to curb the spread of COVID-19 in Rajasthan's several districts. We have analyzed the data from April 26, 2020, to October 31, 2021. We have estimated the reproductive number for all the districts. The analysis attained through the predicted results shows that the modified SIRD model effectively identifies the transmission and mortality rate of COVID-19 in India in the 33 districts of Rajasthan.

[ICRDET-2022-1012]

A Novel Approach Based On CHIP High Speed Optical Transreceiver using 1cm length Optical Fiber

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On-chip optical interconnects (OIs) have the potential to outperform electrical wires and to ultimately solve the communication problem and obtain high-performance, low power consumption and delay in integrated circuits. On-chip interconnects are an important factor in an integrated circuits which increase performance in VLSI. Performance optimization has always been a critical step in the designing of integrated circuits. In this paper, an optical interconnects of 1cm multimode fiber in 1550nm range is being implemented using OptiSpice software. A novel approach is being established in this paper for an optical interconnect for obtained the better performance.

[ICRDET-2022-1013]

A comprehensive review of various attacks in Mobile Ad Hoc Networks

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Mobile ad hoc networks (MANETS) have gained much attention due to their dynamic nature and efficiency .These networks are operated in highly dynamic and unpredictable environment . Rapid advances in the field of correspondence have vastly enhanced today's transmission networks .As a result, the measurement of data transmission in business and military applications has grown dramatically. Since these applications include the transmission of information, the need for security concerns has grown as well. Due to their dynamic nature they are susceptible to various attacks.

The lack of a centralized authority to supervise the individual nodes operating in the network makes security in the mobile adhoc network a major challenge. Attacks can originate both within and outside the network. In this paper we will present a survey of various attacks in MANETs and their prevention and mitigation techniques given by researchers .

[ICRDET-2022-1014]

Tumor Detection Using CNN Based Neural Network

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In Neural Network-based Learning techniques, there are several models of Convolutional Networks. Whenever the methods are deployed with large datasets only then could their applicability and appropriateness be determined. Clinical and pathological pictures of lobular carcinoma are thought to exhibit a large number of random formations and textures. Working with so pictures is a difficult problem in machine learning. Focusing on wet laboratories and following the outcomes, numerous studies have been published with fresh commentaries in the investigation. In this research, we provide a framework that can operate effectively on raw photos of various resolutions while easing the issues caused by the existence of patterns and texturing. The suggested approach produces very good findings that may be used to make decisions in the diagnosis of cancer.

[ICRDET-2022-1015]

Numerical Prediction of the Pull-Out Resisting Capacity of Granular Pile Anchor

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The prime object of the current research paper is to analyse the influence of the pile diameter, length and relative density of the granular material of the pile on pull-out resisting capacity of the modified form of conventional concrete pile commonly called as Granular Pile Anchor (GPA) installed in loose cohesion less soil. The single GPA with different length to diameter ratios varying as 10, 6.67, 5 for the length of 300 mm of the pile, 13.33, 8.89, 6.67 for 400 mm length of GPA and 16.67, 11.11, 8.83 for 500 mm length of GPA were examined using PLAXIS 3D. The GPA reinforced soil was analyzed in terms of its pull-out resisting capacity by altering the physical parameters of the pile. The subsoil condition was assumed to be dry and homogeneous throughout. As per the numerical study, it was revealed that all of the factors such as diameter, length and relative density of the pile played an important role in significantly improving the performance of the GPA against pull-out forces. It was also observed that for the constant length, the capacity decreased with an upsurge in the value of aspect ratio of GPA.

[ICRDET-2022-1016]

Unwillingness for Vaccination in India: Real-Life Data Application with Queueing Analysis of Covid-19 Model

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Vaccination is seen as a weapon that not only profits an individual to

ght the deadly SARS-CoV-2 virus but also helps in building herd immunity for the general public. There are a lot of individuals who are keen and willing to get inoculated by the Covid-19 vaccine and return back to their normal life. However, there is some public who still are unwilling for the vaccination due to vaccine hesitancy. And even after vaccination(one dose), there may be cases of breakthrough infections with mild symptoms. Unwillingness for vaccination and breakthrough infections are now very important aspects of this ongoing epidemic amid the vaccination process that needs to be challenged by responsible stakeholders.

Thus, we will first formulate an ordinary diferential equation (ODE) model consisting of willing and unwilling (for vaccination) population along with breakthrough infection.We will then extend ODE model to a queueing model that accounts for the movement of willing and non-willing susceptible individuals as well. The governing equations are formed and the transition rates from one stage to another are taken to follow an exponential distribution. The transient state probabilities of the model are acquired by applying the matrix method and thereafter Runge-Kutta 4th order method is employed to attain various performance indices. The parameters are estimated for our system based on the standard nonlinear least-squares method using the real data of the vaccinated (one dose) population for India between the time period of 5 March 2021 to 3 July 2021. We would first aim to study the impact of this system on the basic reproduction number ρ^0. The sensitivity analysis of ρ^0 is done to recognize the important estimated parameters which may help in controlling the epidemic. Then the impact of the unwillingness and breakthrough infections directly helping in transmission of the infection amid the vaccination process is shown by uncertainty analysis using the technique of PRCC and contour plots. Numerical analysis is also provided to certify the queueing model.

[ICRDET-2022-1017]

SVMBH:Support Vector Machine Based Hate Speech Detection in COVID-19 Era

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Online Social Networks are used for sharing information across the globe. Various Hate mongers use these platforms for sharing Hate, Fear to generate mass panic. In this paper Support Vector Machine is used for detecting the hate speech in COVID-19 era. Data is extracted from Twitter using its Application Program Interface. Hybrid feature engineering is performed by combining TF/IDF, Bag of Words and Length of the tweet. Support Vector Machine Classifier is fine tuned to classify the tweet into Hate and Normal class. The classifier showed 98% Precision, 98% Recall, 98% F1 Score and Accuracy of 97.71% at an Average. In future Deep Neural Networks may be used to improve the performance.

[ICRDET-2022-1018]

Urgent Vacation Strategy for Discrete-time Retrial Queue with Bulk Arrivals

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This study evaluates the efficiency of a batch arrival discrete-time queueing model with retrials and dissimilar two kinds of vacations, one being a non-comprehensive high-priority (emergency) vacation during operation while the other is a regular comprehensive vacation. In a typical comprehensive vacation, the service provider instantly takes a vacation as easily as possible the orbit is unoccupied whereas if the server goes on a non-comprehensive high-priority (emergency) vacation, the client being served joins the virtual lap and the customer that's interrupted must receive service from the scratch. In the proposed model we firstly obtain the generating functions for the customer's number. Then, by using technique of generating function, we give the steady-state analysis. Also, we have derived various useful performance indices such as probabilities when the service provider is idle, busy, on normal vacation and on high-priority (emergency) vacation.

[ICRDET-2022-1019]

On Λ-Fractional Analysis Konstantinos Lazopoulos

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Λ-Fractional Analysis has been introduced just to fill up the mathematical gap exhibited in fractional calculus, where the various fractional derivatives fail to fulfill the prerequisites demanded by Differential Topology. Nevertheless, the various advantages exhibited by the fractional derivatives, and especially their non-local character, attracted the interest of the physicists, although the majority of them try to avoid it.

The introduced Λ-fractional analysis can generate Fractional Geometry since theΛ-fractional derivatives generate differentials. The various aspects of Λ-fractional analysis in fractional differential equations, fractional calculus of variations,fractional differential geometry are indicated. Further applications in mechanics are suggested. The Λ-fractional analysis with horizon is introduced.

[ICRDET-2022-1020]

On equality of inner automorphisms group with different automorphism group

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In this paper, we have studied the relationship between the group of all central automorphisms fixing the center elementwise and the group of all inner automorphisms on finite p-groups. We have characterized all finite p-groups G for which the centre of all inner automorphism group is equal to the group of all central automorphisms fixing centre element wise. We have characterized all finite p-groups G of co-class 2 whose the centre of all inner automorphism group is equal to the group of all central automorphisms fixing centre element wise.

[ICRDET-2022-1021]

Generalized fractional Integral formulas involving the product of hypergeometric functions and Fox's H-functions

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In this paper, our main objective is to obtain some fractional integral formulas concerning products of the generalized hypergeometric functions and Fox's H-functions. Moreover, we give some interesting special cases of our main results.

[ICRDET-2022-1022]

Dynamical Modelling Analysis using Different materials of Capacitive Pressure Sensor Applications

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This paper discusses the principle, design and theoretical dynamical modelling of mems capacitive pressure sensors with varied material properties that have been simulated as well a comparison of results has been presented. The properties of material ensure that sensor performances analysis has been analysed 0-15 kPa for operating pressure range. This work also discusses Timoshenko's plate deflection theory and follow the pull-in phenomenon, finally for measuring the accurate sensitivity numerical solution is also presented. The behaviour of the touch mode capacitive pressure sensor in terms of the temperature dependence of capacitance is analyzed and also observed the repeatability error is reduced. this comparison of results shows that aluminium material gives the highest deflection and better capacitance sensitivities are about 35aF/0.1bar and deflection is linear with the applied pressure. This configuration touch mode pressure sensor is promising for the use of health monitoring devices like patient blood pressure.

[ICRDET-2022-1023]

Bianchi Type V Magnetized Stiff Fluid Models in Lyra Geometry

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We have investigated Bianchi Type V cosmological models in presence and absence of magnetic field based on Lyra Geometry. The magnetic field is due to an electric current produced along x-axis. The physical and geometrical aspects of the models and singularities in these models are also discussed.

[ICRDET-2022-2001]

Replacement of Fine aggregates in Concrete: study on various Agro-wastes

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Illegal mining of river sand had an adverse effect on the eco-system. The land slides ,continuous floods, tectonic movements had destroyed the peace of common man. The aim of this research is to study the aspects of fine aggregates and replacing the same in concrete by various agricultural wastes. In this study, corncob ash, groundnut shell and sugarcane bagasse ash are used as the replacing fillers. The properties of these agro wastes are at various replacement levels of 0%, 5%, 10%, 15% and 20% with fine aggregates are analyzed. The study reveals the various fresh concrete tests such as slump test, shrinkage test and density test . In the hardened state of agro – waste concrete, various tests such as compressive strength, flexural strength, ultrasonic pulse velocity tests were analyzed at the age of 7 days, 28 days, 56 days and 90 days. The utilization of agro – wastes proves to be very sustainable and eco – friendly in construction but the limitation is its replacement level. Keywords- Agro-waste concrete, Corncob ash, Groundnut shell, Sugarcane bagasse.

[ICRDET-2022-2002]

Structure Strength Check and Repair Technique of RCC Structures

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In India maximum structure is made up of reinforced concrete as camper to Steel Structure. After construction of reinforced concrete structures are subjected to repairs and damages to with respect time and age of the structure. So, to keep the reinforced structure in a good and healthy condition we need some repair and rehabilitation, and retrofitting methods to minimize the losses and avoid large damages in the reinforced concrete structures. By using these methods, we can minimize the losses and avoid sudden failures of the reinforced concrete structures. Nowadays the use of rehabilitation and retrofitting methods are increases. In this most failures of reinforced structures are minimized. The major and minor losses of reinforced concrete structures are identified and later minimized. This paper mainly focuses on various types of repairs of reinforced concrete structures and the importance of using rehabilitation and retrofitting methods in reinforced concrete structures. The main aim of the study is to identify the repairs and damages in the reinforced cement concrete structures and solve the repairs by using suitable methods to decrease the damages. This is placing an important role in the early detection of damages and decrease the severity and losses of the damage in the reinforced cement concrete structures. Keywords- Repair,

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[ICRDET-2022-2003]

Application of Artificial Neural Network in Prediction of hardness value of Al 6063 reinforced with SiC

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This work is based on development of Predictive Model for Metal Matrix Composite using Artificial Neural Network for prediction of hardness value of the developed Al 6063 composite reinforced with silicon carbide by using stir casting machine. ANNs are numerical coding that imitates the working style of human brain. For prediction of the data the training of the network is done by using two sets of data called the training data and test data by using feed forward back propagation technique. The Design of experiments was done using Taguchi L 16 orthogonal arrays and 70% of the data was used as training data and 30% of the data was used as test data for checking the developed network. Reinforcement %, Stirring speed and stirring time were taken as the process parameters .The whole work is divided into two parts, in the first part the composite were obtained using L 27 orthogonal arrays and the hardness values of the sample were recorded .In the second part the training of the Artificial Neural Network was done using the training data and finally the network was tested using test data .The Predicted value of the the network was compared with the experimental data. After comparing the results it can be said that a well trained ANN Model is an efficient tool in predicting the hardness value of the developed composite.

[ICRDET-2022-2004]

CCTV Image Authentication using Digital Watermarking

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The life of human today is now called modern life. It is a time with technology everywhere. Human got new latest technology in every field as well becoming the part of new innovation. The target of Science and Engineering is to develop best solution to real life problem. The CCTV Coverage is very effective to control crimes in different aspects as a part of Computer Vision. CCTV video footage is one of the best mediums of criminal investigation. The CCTV camera technology is very popular today not only at public places but also at private places. It is one of the ways to dare public about not to do any criminal activity. The forensic team investigate the recording to check activity. This clip can be modified because is a digital content. So, protection against any modification can be provided by using Digital Watermarking. This can be achieve using DWT which works in frequency domain. The research work presenting here is to provide better security to CCTV clips against any modifications. The result presented shows the practical implementation on the CCTV clips.

[ICRDET-2022-2005]

Optimization of Process Parameters of Friction Stir Welding of Two Dissimilar Mg alloys like AZ31 and AZ91

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Friction stir welding is a solid state welding process that uses a third body tool to weld two materials. In this paper two different Magnesium alloys like AZ31 and AZ91 are welded by FSW using modified vertical milling machine. In this paper following process parameters like welding speed (710 rpm,1000 rpm,1400 rpm,) , tool rotational speed (20 mm/min, 31.5 mm/min,80 mm/min,) are considered and to weld a butt joint of two materials of size 100 mm x 50 mm x 6 mm each . The material selected for tool is Stainless Steel having shoulder diameter of 16 mm and pin diameter of 5.5 mm. This paper mainly concentrate on the measurement of tensile strength, hardness on weldments of two dissimilar materials like AZ31 and AZ91 by friction stir welding and to get the optimum solution.

[ICRDET-2022-2006]

A mathematical study on the Polymerization shrinkage and its effect On dental restorative material

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To derive an analytical solution of shrinkage stresses in a simplified Class-I composite restoration using a viscoelastic material model. Methods. Simplified, multi-layer, circular plane models were used to represent different sections of a tooth with a Class-I restoration: one section is close to the top occlusal surface and the other is at a deeper location of the restoration. The sections are therefore subjected to different stress states, i.e., plane-stress and plane-strain, respectively. The analytical solution got was compared with the numerical results from finite element analysis. A sensitivity study was then carried out to examine the relative influence of geometric and material parameters on shrinkage stress development. A viscoelastic solution for the shrinkage stresses developed in a simplified Class-I restoration during polymerization has been derived. The solution allows the influence of several geometric and material parameters on shrinkage stress development to be examined readily. It also provides a benchmark test for more elaborate numerical schemes before they are used to analyzing more complicated cases.

[ICRDET-2022-2007]

A Comparative Study on thermodynamics properties of Se-Te- Zn and Se-Te-Ag Ternary Chalcogenide Glasses

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This paper presents the comparison of the influence of additives Zn and Ag on the thermodynamics properties of Se80-xTe20Mx (M=Ag, Zn), ($0 \leq x \leq 10$) glasses using Differential Scanning Calorimetry (DSC) under non-isothermal condition at different heating rates. Different theoretical models have been employed to study the activation energy of glass transition (Et) and crystallization (EC), Entropy, Enthalpy and Gibbs free energy for the best understanding of thermal stability. These parameters are found to be highly composition dependent. This also indicates that the glass network of the binary alloy is influenced significantly due to addition of the modifiers (Ag, Zn) used in the present study. Furthermore, investigated outcomes illustrate that the incorporation of fixed amount of Te with increasing Ag and Zn concentration affects the kinetic energies and glass forming abilities of the as formed glasses. However, when Zn compared with Ag glasses, it is found that they show almost the same kinetic parameters.

[ICRDET-2022-2008]

Integral representation of mathieu-type series associated with extended hypergeometric functions

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The objective of this article is to represent integral form for the Mathieu-type a series and for associated alternating version whose terms contain a extended Gauss hypergeometric function. Some special cases of the result presented here are also obtained.

[ICRDET-2022-2009]

A Study on "Environment Friendly Concrete"

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It's very common about the importance and necessity of concrete in construction industries. However, a known fact, a lot of energy is utilized for the preparation of concrete which in turn imbalances the environment by creating various health hazards. The concept of Green concrete is gaining popularity compared to normal concrete. Nowadays it plays a very good role in the construction of structures. It is subjected to very low energy consumption and low resource consumption. This paper mainly deals with the study of importance of Environmental friendly concrete and its applications and advantages and disadvantages as well.

[ICRDET-2022-2010]

Design and Simulation of C2N based solar cell by SCAPS-1D software

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Recently, a novel nitrogenated holey two-dimensional material, C2N, has been successfully synthesized via a simple wet-chemical reaction. Its merits have drawn much attention from the scientists.

However, to the best of our knowledge, few reported works employed C2N as photovoltaic materials and the practical solar cells based on C2N have not been fabricated in lab. In this work, we carried out simulation using Scaps-1D to investigate the influences of different parameters on the C2N based solar cell. By varying the acceptor density, layer thickness, defect density of C2N and changing different N layers coupling with C2N, we found out that suitable acceptor density, around 1015cm3, large layer thickness of C2N and low defect density were key factors to obtain high-performance solar cells. Small band offset also played an importance role in enhancing the performance of photovoltaic materials. With optimized parameters, C2N coupling with CdS as heterojunction can achieve an efficiency of over 17%. This work may provide valuable insights into future design of C2N based solar cells.

[ICRDET-2022-2011]

UPVC Compression Members Behaviour as Double Skin Tubular

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Concrete-filled tubes provide unnecessary closure. In recent years, more studies have been reported of the members' double-skin lesions. However, most of them had metal tubes. The study reported in this paper presents the experimental work on a double-skin (DSTC) column with UPVC tubes - both as inner and outer skin. The DSTC models with an H / D dimension of 3 and the outer diameter of 90 mm and 75 mm are made of 30 mm UPVC tube as the inner diameter of each tube as 3 mm. Two types of DSTC models were studied, one with a blank internal core and the other with a solid spine. Examples of single-skin tubes have been developed to compare the behavior of single and double skin. The matrix was considered a self-compact concrete (SCC), as it contains a large amount of fly ash, so the compressive strength of the matrix and the tubular specimens over 28 days were also investigated. Comparison of test results with EUROCODE 4, ACI, Australian code, and energy absorption tests and confinement parameters is presented.

[ICRDET-2022-2012]

Optical gain investigation of nano scale heterostructure GaInP/AlGaInP red laser

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Nowadays laser diodes, LED's, optical wave guides, directional couplers and photo detectors are widely used in telecommunication, for biomedical applications, pollution monitoring tools etc. Lasers can be designed by using various semiconductor materials by changing their composition. In our work we have designed a nano scale hetero structure using semiconductor compounds GaInP/AlGaInP for generating a wavelength of 635nm having optical gain of order 4000/cm at carrier injection of 5*1012/cm2 at room temperature. The calculation of wave functions, dipole moments and optical gain are done by using Luttinger Kohn 4*4 model. The optical gain computed for Ga0.46In0.54P/Al0.25Ga0.27In0.48P type-I quantum well hetero structure (varying well width 3nm-7nm) is further analyzed for external strain applied and at different temperatures in order to make the laser more suitable to be used for different purposes. The effect of uniaxial strain [001] applied shows significant improvement in optical gain under z polarization whereas x and y polarizations are less effected by applied strain. The designed hetero structure is analyzed under different temperature conditions for below and above room temperature. The reported results show that the designed laser can be used for a range of 600-650nm wavelength.

[ICRDET-2022-2013]

An audio Steganographic technique based on Vedic numeric code

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Audio Steganography is an approach to inserting visible or invisible marks into a digital multimedia data for further detection of rightful ownership at the later stages. Mostly, Steganography schemes focus on text and image steganography, and a few are related with audio. This report concentrates on improving the performance of spread spectrum audio steganography technique. Audio Steganography is the process of embedding a encrypted digital signal into an audio signal for proof of rightful ownership. This process is rather difficult due to the high sensitivity of the Human Auditory System (HAS). Among all the steganography techniques, audio and video steganography is very efficient for secret message transmission. In this work, we used text based steganography with audio steganography, which is done through the spread spectrum watermarking technique. In text steganography, message can be hidden by shifting word and line in open spaces or in word sequence. The advantage of preferring text steganography over other steganography techniques is its smaller memory requirement and simpler communication. Proposed text based steganography uses characteristics of English language such as inflexion, fixed word order and use of periphrases for hiding data rather than using properties of a sentence as in. This gives flexibility and freedom from the point view of sentence construction but it increases computational complexity.

[ICRDET-2022-2014]

Analyzing a Flexible Pavement with IIT-Pave As per IRC: 37:2018

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Since then, both the traffic pattern and technology have evolved. The number of tandem, tridem, and multi-axle vehicles has skyrocketed, and larger axle weights are becoming more frequent. Because pavements are built according to design standards and specifications, they may not serve efficiently, safely, or economically for the planned term due to early deterioration of materials with differing qualities.

The focus has switched from large-scale usage of conventional aggregates to use of local, recycled, and engineered marginal aggregates in construction due to environmental concerns and regulatory constraints on quarrying. Fatigue cracking and rutting deformation, induced by excessive horizontal tensile strain at the bottom of the bituminous layer and vertical compressive strain on top of the subgrade, are well-known causes of asphalt pavement failure. This research aims to broaden the scope of pavement design by incorporating alternative materials such as cementitious and reclaimed asphalt, and analyzing them with the IITPAVE software. A road stretch surrounding Jaipur was chosen for this investigation, and the engineering features of subgrade soil were investigated. Cementitious Base and Cementitious Sub-base of aggregate interlayer for crack relief are examples of varied pavement composition materials. Cementitious base and sub-base with SAMI at the base-bituminous layer interface. RAP treated with a foamed bitumen/bitumen emulsion or new aggregates The traditional granular base and granular sub base have been designed, studied, and compared to cementitious sub-base. In comparison to standard granular base and granular sub-base, the employment of various composition materials in pavement structure enhances serviceability. Among all the composition the cemented base and sub base with SAMI gives better serviceability because of substantial reduction in strains, thickness and cost effective compared to other design. Hence it can be recommended for stretch selected for studies.

[ICRDET-2022-2015]

Electric vehicles: an alternative to conventional vehicles

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Electric vehicles have been developed over the last two decades as a way of reducing the toxic emissions and energy consumption in the transportation sector. Electric vehicles (EVs) are being promoted aggressively all over the world as a means of reducing fossil fuel emissions and addressing environmental concerns. Various governments are providing incentives to encourage people to switch to electric vehicles. Recent research has raised an important question about the matter: Is the electric vehicle the best solution for reducing energy costs, pollution, and conserve the environment? .

A review and analysis of the existing literature on electric vehicles, as well as their positive and negative attributes in all aspects has been conducted in order to address this question. In this study, the literature regarding all aspects of electric vehicle performance which includes environmental impact, energy consumption, cost, reliability etc. were reviewed. Additionally, the extent of conflict among the different factors affecting the performance of electric vehicles was determined to demonstrate the overall picture of electric vehicle performance as compared to that of IC engine vehicles. In this article, there is a detailed and comparative study along with the advantages and disadvantages of electric vehicles over the conventional vehicles based on various leading factors.

[ICRDET-2022-2016]

Power Quality Improvement using Active Power Filter

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Nowadays with the advancement of technology, the demand for electrical power is increasing at an exponential rate. Many consumer appliances demand consistent quality power for their operation. The performance of the end-user equipment depends heavily on the quality of power supplied to it. But the quality of power delivered to the end-user is affected by various external and internal factors such as voltage and frequency variations, faults, outages, etc. These power quality problems reduce the lifespan and efficiency of the equipment. Thus, these problems should be minimized to enhance the performance of the consumer equipment and also to enhance the overall performance of the system. The main effect caused by these problems is the production of harmonics. This results in the overheating of the equipment, insulation failure and over speeding of induction motors, etc. The solution for eliminating these problems is to filter the harmonics from the system. For this purpose, there are many filter topologies present within the paper. A hybrid filter has been studied in this paper which is a combination of series active filter and shunt passive filter. This paper presents the control strategy to regulate the filter in such a way that the harmonics are reduced. The proposed control strategy is simulated in MATLAB SIMULINK and therefore the results are presented.

[ICRDET-2022-2017]

A Review on Recycling Plastic Waste into Sustainable, Valuable and Useful Products

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Use of plastic materials increases day by day since its invention in the 20th Century. It has changed our lives, bringing many benefits and also huge damage to environment. Plastic wastes are non-biodegradable and can stay in the ecosystem for many decades. It can go through aging processes resulting from physical, chemical, and biological actions with the potential to harm habitats and weaken the life-supporting environment. This review article covers some of the options like recycling of plastic waste into diesel fuel, recycling plastic waste into yarn and fiber and also use of plastic waste material as sustainable resource in civil engineering.

[ICRDET-2022-2018]

A Review of Applications of Biopolymeric Membranes in Removal of Organic Pollutant and Micro pollutants from Wastewater

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This paper presents a detailed analysis of biopolymeric membrane applications in the removal of micropollutants from wastewater.

In this paper consequences of using non-biodegradable membrane and benefits of using nanostructured biodegradable polymeric membranes have been discussed. When compared to non-biodegradable polymers and degradable biopolymers, these biopolymer materials have the following advantages: renewability, biocompatibility, biodegradability, and cost-effectiveness. Modifications to biopolymeric membranes have also been thoroughly discussed. Recent improvements in the use of nanofillers to stabilize and improve the performance of biopolymeric membranes in the removal of organic pollutants have been considered. Biopolymeric membranes are used in removal of Organic colours (methyl blue, Congo red, azo dyes), crude oil, hexane, medicinal compounds such as tetracycline and micropollutants. The characteristics of biopolymeric membranes were also discussed.

[ICRDET-2022-2019]

Chronological Review of Electrical Vehicle Technology

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This paper reviews the chronological advancement of electric vehicle and its applications. Here, only controlling features are specifically discussed by various authors. It critically appraises a number of state-of-the-art research progresses in this field developed within the last ten years. Finally, it points out the future potential research directions regarding electric vehicle technology and its applications, especially of charging techniques. By reading this review paper, readers will not only grasp a technical background of electric vehicle technology, but also gain a full picture of the research field. In the hybrid concept, the source of power is a combination of heat engine and batteries (in essence, the heat engine supplies steady state power and the batteries supply transient power demands). This paper contains limited results of a study aimed at determining the feasibility of using a hybrid heat engine/electric propulsion system as a means of reducing exhaust emissions from street-operated vehicles. It covers the electric motor/ generator and their control systems but excludes the heat engine, emissions and the battery portion of the study. Several classes of vehicles as well as several design configurations were considered in the study. Following a review of associated technologies, requirements for electrical components were determined. Based on these results recommendations were formulated to ensure early demonstration of prototype vehicles.

The purpose of this paper is to present information, results of studies and general recommendations on the electrical features of the system. An earlier paper presented at Intersociety Energy Conversion Engineering Conference in Boston gave data on the mechanical features of the studies and also estimates of the pollution levels to be expected from the use of various types of heat engines.

[ICRDET-2022-2020]

A Review Paper on Performance analysis of Mobility adaptive Slotted CSMA/CA MAC protocol for Mobile IEEE 802.15.4 Wireless Sensor Networks

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The IEEE 802.15.4 standard MAC protocol for WSNs is design mainly for static sensor networks and its capability to support the networks of mobile sensor has not yet been established. Integrating node mobility features in WSNs raises many new challenges to the research association. In WSN, node mobility is expected to facilitate many applications, from home healthcare and medical monitoring to detect the target and monitoring animals. Mobility in WSN raises new challenges and problems that occur at MAC layer due to the existing link failure and new link formation. To overcome these limitation of mobile nodes we have proposed mobility adaptive (MA)- CSMA/CA with adaptive BE for mobile WSNs in this paper. The proposed MAC is energy efficient while maintaining high throughput and low latency compared to the existing standard CSMA/CA MAC protocol of IEEE 802.15.4. The proposed work is implemented on Qualnet 5.0.2 Network Simulator and the performance of CSMA/CA and MA-CSMA/CA MAC protocol is evaluated for mobile WSNs.

[ICRDET-2022-2021]

A Review on Transmission Line Protection Schemes

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The stability of power system is largely affected by faults on the transmission line and time required to clear the faults. Thus, the power system stability and power quality are dependent on the transmission line protection schemes. Quick detection of faults helps in faster maintenance and restoration of supply, resulting in improved stability, power quality and economy of power system. Various methodologies have been proposed in the literature for transmission lines protection. In this paper a review of proposed literature schemes has been done to identify the research gaps, which are still there to be overcome. For this, various kinds of transmission systems and the kinds of technique proposed have been taken into consideration. A brief comparison among proposed schemes has also been made to identify the significances of one technique over other.

[ICRDET-2022-2022]

Role of nanoscience and nanotechnology in improving the efficiency of Solar cell - graphene sheets in solar cell

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Nanomaterials play a vital role in the applications of Nanotechnology in the field of fabrication-such as information technology, energy resources, health and medical therapies. As our reliance upon sustainable power source turns out to be clearer, the requirement for proficient solar based cells turns out to be more critical, particularly when they are one of the most straightforward and least expensive approaches to produce clean vitality. As a rule, Solar cells are not excessively effective. Ongoing advances in graphene - based sun powered cells have seen the reflectance of sunlight based beams diminished by 20%, which gives potential proficiency increments up to 20%. These are at present a wide range of varieties of graphene-based sun based cells being explored today. This guide gives a far reaching review into the technique which is being examined and thereof accomplishing a decent productivity.

[ICRDET-2022-2023]

Fractional integrals using generalized bessel Function associated with generalized fractional Calculus operators

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Many infinite integrals involving the product of several Bessel functions have been obtained. Choi and Agarwal have described two integrals involving the generalized Bessel function ${}_hJ_v$which is represented by Galue [1]. Using the same method, in this paper, we present two generalized integral formulas involving the product of generalized Bessel function of ${}_hJ_v$, which are expressed in terms of the generalized Lauricella series due to Srivastava and Daoust.Some interesting special cases of our main results are also considered.

[ICRDET-2022-2024]

Mathematical Modelling and Analysis of Diesel-Biodiesel- Ethanol blends and Tio2 Addition effects into the Combustion and Emissions Characteristics in CI Engine

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Incrementing interest in diesel engine technology and the perpetual ordinate dictation of finding alternative sustainable fuels as well as reducing emissions has incentivized over the years for the development of numerical models, to provide qualitatively predictive implements for the designers. Among the alternative fuels, biodiesel especially second generation biodiesel is considered as a sustainable and the most promising option for the diesel engine. Biodiesel is a bio-fuel which has kindred properties to diesel and can yarely be utilized in a diesel engine with minimal modifications. Promising results have been determined utilizing amalgamations of biodiesel and diesel with the reduction of soot and emissions of a diesel engine. Experimental analysis of diesel engines can be sumptuous and ergo Computation Fluid Dynamics programs are habituated to analyze the combustion process. Present Study deals with the effect of Titanium oxide nano particle integration to diesel-biodiesel-ethanol blends by utilizing Computational Dynamics Method. In the current study, we investigate that as we incremented the percentages of Bio-fuels and Ethanol the efficiency of the coalesced fuel is incrementing and pollutant like Cox and NOx are decrementing which shows solubility test as in an anterior work was stable. In a compression-ignition engine, NOx emissions are one of the main pollutants and are primarily influenced by the quantity of oxygen available and the temperature in the cylinder.The NOx emission is composed of NO, NO2, N2O, N2O5, NO3. Nitric oxide is the major constituent and NO2 is a minor constituent, while the others are negligible. At elevated temperatures (i.e.) above 1500 C, N2 can react with O2 more expeditious and may result in more NOx emission.Compression-ignition engines have an increased compression ratio and are reduced-combustion engines, The peak temperature is well over 1500C; therefore, there is an upper box formation.. In present work the evaluation of the NOx (Prompt and Thermal) is withal carried out we investigate from CFD Results that NOx percentages are decrementing with the integration of Tio2 (225 ppm) and higher no. of BDE because as the temperature is getting higher the N-O bond will we collapsed due to this Nitrogen is relinquished to the environment, hence NOx percentage is decrementing from lower no. of BDE to the higher no. of BDE.

[ICRDET-2022-2025]

Study of Mechanical Poperties of Stir Casted Al 6063 Alloy Reinforced with Fly ash

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The present study focused on the study of Stir casted Al 6063 alloy reinforced with fly ash. Stir casting process is used for the development of the composite. The study focus on the mechanical properties namely tensile strength and hardness.The samples prepared were tested for tensile strength and hardness and was compared with the base metal. There was an improvement in both tensile strength and hardness of the stir casted composite.

[ICRDET-2022-2026]

Impact of Various Combustibles on Refractory Brick Thermal Insulation

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The effect of various combustible materials on insulating properties of refractory bricks produced from Enugu fire clay and Ekebedi clay has been studied. This is aimed at determining the most favourable combustible material for different composition(s).

The clays with combustible materials were used to compose different samples labeled A-G with varying percentages of combustible materials at reducing rate of 5% from 40 to 10%. The combustible materials used were paper pulp, saw dust, rice husk and cow dung. Properly mixed bodies with required moisture content were hydraulically pressed into shape and the bricks were oven-dried at temperature of ±110°C. The properties of the produced insulating bricks were investigated after sintering at 1300°C. The results indicated that samples A-G of the products had % shrinkage ranging from 18 - 4.1% with corresponding bulk density of 0.57- 1.29 g/cm3 respectively. The investigation revealed that samples of the bricks as stated above had crushing strength ranging from 0.008- 16.05 MPa with corresponding percentage porosity ranging from 85.71-19.75% respectively. The estimated refractoriness using shuen's formula revealed that samples A-G had 1004.6-1506.8°C range of refractoriness while the result of the refractoriness using Pyrometric Cone Equivalent (PCE) indicated that samples A-G had cone 05A (1010°C) - cone 19 (1520°C) range of refractoriness. Spalling count test result revealed that samples A-G of bricks as stated above had number of cycles ranging from 31-8 respectively. It was discovered that the higher the combustible materials the higher the shrinkage, porosity and spalling count cycles while the lower the bulk density and crushing strength of the bricks. Samples of the insulating bricks produced with rice husk gave the most favourable result when considered against the properties stated above. Therefore, 30 and 25% (samples C and D) of the rice husk can be used as combustible material for mass production of insulating bricks.

[ICRDET-2022-2027]

Performance Analysis of Wire Electric Discharge Machining on D-3 Die Material by Artificial Neural Network

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Demand in present industries which specialize in cutting complex shapes and geometries of conductive metals of any hardness that are difficult or impossible to cut with traditional machining process.

WEDM is one of the most commonly used machining which is employed in machining of conductive hard metals. The literature survey has revealed that very lass work has been done in order to achieve optimal level of process parameters for D3 die material using coated wire electrode. This material has been selected keeping in view their application and machined using Electronica maxicut e.The main objective of the present work is to investigate the effect of different process parameters viz. pulse on time, pulse off time , spark voltage , peak current on the response parameters such as surface roughness and MRR using coated wire electrode (0.25 mm diameter). The taguchi design methodology is chosen for design of experiment and L18 orthogonal array are selected for present work. Estimation and comparision of response was done by using Artificial Nural Network (ANN).

[ICRDET-2022-2028]

Noise Detection and Removal Filtering Techniques in Medical Image

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In this experiment work we have taken multiple samples of different types of noisy image like MRI, Cancer, X-ray, and Brain and we have calculated standard derivations and mean of all these medical images after finding Gaussian noise and then we have applied median filtering technique for removal of noise. After removing a noise by using median filtering techniques again standard derivations and mean are evaluated. This experimental analysis will improve the accuracy of the MRI, Cancer, X-ray, and Brain images for easy diagnosis.

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