2020

PROCEEDINGS ICFE-2020

Proceedings of International Conference on

# Future Engineering 2020

MAZEDAN
INTERNATIONAL RESEARCH ACADEMY
SINCE 2008

# PROCEEDINGS OF "INTERNATIONAL CONFERENCE ON FUTURE ENGINEERING-2020"
# 26-27 June 2020
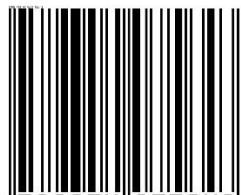# (Vol-I)

## AYODHYA INDIA

## Jointly Organized by:

Mazedan International Research Academy

Dr. Rammanohar Lohia Avadh University Ayodhya

Dr. Ambedkar Institute of Technology Bengaluru

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Proceedings of International Conference on Future Engineering (ICFE-2020)

*Editor-in-Chief*

*Dr. M. Okan Tüysüz*

*Associate-editors*

Dr. Nitesh Kumar Dixit,
Dilip Kumar
Ashish Kumar Pandey
Zaineb Naaz

# INTRODUCTION

The International Conference on Future Engineering (ICFE-2020) jointly organized by Dr. Rammanohar Lohia Avadh University and Mazedan International Research Academy is held at Ayodhya, Uttar Pradesh, India during June 26-27, 2020, with the aim to provide a platform for researchers, engineers, academicians as well as industrial professionals from all over the world to present their research results and development activities in design and optimization. This conference provides opportunities for the delegates to exchange new ideas and application experiences face to face, to establish business or research relations and to find partners for future collaboration. All full paper submissions are peer reviewed and evaluated based on originality, technical and/or research content/depth, correctness, relevance to conference, contributions, and readability. The full paper will be chosen based on technical merit, interest, applicability, and how well they fit a coherent and balanced technical program. In two days program, we have several keynote addresses from academic and industry experts, technical sessions involving participants research paper presentations, tutorials, technical exhibitions etc. The conference reaches its aim to provide a common platform for the exchange of ideas, sharing of knowledge and experience among the participants and experts from academia and industries, to benefit the budding engineers and researchers.

The theme of the conference is "Developments for future engineering"

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# Message from Vice Chancellor Desk

### Prof. Manoj Dixit

I am pleased to know that the Department of Mechanical Engineering, Institute of Engineering & Technology Dr. Rammanohar Lohia Avadh University, Ayodhya is going to organizing first International Conference on "Future Engineering" through Virtual mode on date 26-27 June, 2020. International Conference is to be organized with the collaboration of Dr. Rammanohar Lohia Avadh University, Ayodhya, Dr. Ambedkar Institute of Technology, Bengaluru and Mazedan International Research Academy and also publishing a Souvenir on this occasion.

It is a matter of great pleasure to hold such a conference during the time of global epidemic. It is indeed heartening to know that Mazedan International Research Academy has recognized the Future Engineering theme presented by the organizers for this International Conference and in view of its importance and necessity; it has provided its valuable support in various ways.

I am hopeful that ICFE-2020 will play an important role in providing a platform to stakeholders to share their recent innovations, research findings, trends, and concerns in theory and practice.

I extend my best wishes to the organizers.

Prof. Manoj Dixit
Vice Chancellor
Dr. Rammanohar Lohia Avadh University, Ayodhya

# Message from Pro Vice Chancellor's Desk

### Prof. S.N. Shukla

It is our proud privilege that Institute of Engineering & Technology, Dr. Rammanohar Lohia Avadh University is hosting the First Online International Conference on Future Engineering. I would like to thank Mazedan International Research Academy, for choosing Department of Mechanical Engineering as Technical Organizing Collaborator for this conference. I also thank to Dr. Ambedkar Institute of Technology, Bengaluru for his consent and support. Aim of the conference is to provide a shared platform to academia and industry networks to address the difficulties, most recent turns of events and offer their aptitude in different emerging areas of information technologies.

I wish the organizing team of this conference a great success with a hope that it will strengthen the young professionals mind.

Prof. S.N. Shukla
Pro Vice Chancellor
Dr. Rammanohar Lohia Avadh University, Ayodhya

# Message from Chairman BoG
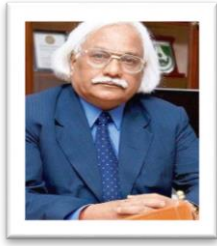


## Prof. P.B. Sharma

As a Member of the Honorary Board, I wish to extend a warm welcome to the International Conference on Future Engineering at Institute of Engineering & Technology, Dr. Rammanohar Lohia Avadh University Ayodhya, June 26-27, 2020. It is my pleasure to welcome you to this important event. The conference has brought together a remarkable and rich variety of authors and speakers from universities, institute and industry to share their ideas, innovations and new perspectives on a wide range of engineering field. Future Engineering is a very complex field, where multi-disciplinarily is the leading word and it represents the only way to effectively tackle important still unmet future problem. The conference program will be covering a range of important topics: from the development of innovative solutions for energy & green technology and greater energy efficiency to carbon capture, nanostructures and nano-materials, as well as emerging materials for product development, artificial intelligence, cyber security, robotics, power system control and smart grid, 3d printing & design among many others. I hope that the Conference is a fantastic success and would like to take this opportunity to extend my warmest good wishes to all connected with the International Conference Future Engineering.

Prof. P.B. Sharma
Chairman BoG
IET, Dr. Rammanohar Lohia Avadh University, Ayodhya

# Message from Director Desk



## Prof. R.P. Mishra

It is my pleasure to welcome all the participants for the International Conference on Future Engineering (ICFE-2020) organized by Institute of Engineering & Technology, Dr. Rammanohar Lohia Avadh University, Ayodhya with the collaboration of Dr. Ambedkar Institute of Technology, Bengaluru and Mazedan International Research Academy, on 26 & 27 June 2020. I thank to our Honourable Vice Chancellor, Prof. Manoj Dixit Sir for his vision and leadership. I also thank our Honourable Pro Vice Chancellor, Prof. S.N. Shukla Sir & Honourable Chairman BoG, Prof. P.B. Sharma Sir for his constant guidance, direction and support. A conference is a place where true meeting of minds happen. Researchers, who would have done a good deal of thinking about their idea & thoughts, will come forward and share their knowledge with fellow researchers. I hope this conference will provide a stage for researchers to get networked and exchange their thoughts for further progress in research and development. I am proud to know that the conference has received good numbers of quality papers including few papers from abroad. I congratulate Mr. Nitesh Kumar Dixit, Conference Convener & HOD of Mechanical Engineering and Mr. Dilip Kumar, Mr. Ashish Kumar Pandey & Dr. T.N. Raju, Organizing Secretary of the conference for their sincere and systematic effort in organizing this conference. I wish the organizing committee a great success of the conference and thank the participants for their participation.

Prof. R.P. Mishra
Director
IET, Dr. Rammanohar Lohia Avadh University, Ayodhya

# Message from Principal's Desk

### Prof. C. Nanjunda Swamy

It gives me immense pleasure to write a message for 1st International Conference on Future Engineering jointly organised by Mazedan International Research Academy, Dr. Rammanohar Lohia Avadh University, Ayodhya and Dr. AIT, Bangalore during 26-27 June 2020 at IET Ayodhya. As a Principal of Dr. Ambedkar Institute of Technology, Bangalore I can fully understand the aptly coined conference theme "Future Engineering" reflects the importance of engineering advancement for the sustainable development of the country.

I hope eminent speakers will cover the theme of the conference from different perspectives. I am privileged to say that the outcome of the conference will definitely offer sustainable solutions to engineering issues.

I wish the conference a great success and I am sure the conference to be a good technological extravaganza.

Prof. C. Nanjunda Swamy
Principal
Dr. Ambedkar Institute of Technology, Bangalore

# Message from Honorary Members

### Prof. Rajeev Srivastava

International Conferences are getting much importance now days to connect and integrate different stack holder of society. The design of integrated approach of technologies towards research and development can be well emphasized among the working groups with different ideas and vision. The aim of the Conference on Future Engineering (ICFE-2020) can be well achieved to the above objective.

The beauty of a conference such as ICFE-2020 is that it allows such exchanges which in turn will ignite more ideas and ways of improving the presented ideas, communication skills and many more. I wish the conference would be able to deliberate on current issues of national and International relevance, in the field of Future Engineering using technological developments like 3D Printing Design, Industry 4.0 & 5.0, Artificial Intelligence, Automation & Robotics, Block Chain, Mechanical System design, Machine Learning, Energy and Green Technology, Renewable Energy system, Cloud Computing, Networks Security and Image Processing etc.

I convey my warm greetings to the organizing committee and the participants and extend my best wishes for the success of the conference.

Prof. Rajeev Srivastava
Mechanical Engineering Department
Motilal Nehru National Institute of Technology Allahabad, Prayagraj

## Prof. Satya Prakash Tewari

I am happy to know that International Conference on Future Engineering is jointly organised by Mazedan International Research Academy Dr. R. L. Avadh University, Ayodhya and Dr. AIT Bangalore on 26-27 June, 2020 in the holy city of Ayodhya. It is an inter disciplinary conference covering different areas of mechanical, electrical, electronic, computer, industrial and civil engineering. Delegates will exchange new ideas in the field of computational intelligence, computer networks, security and privacy, artificial intelligence, database technology etc. I believe that this platform will help to exchange new ideas to establish research relationship and to find partners at national and international level for future collaboration.

I sincerely hope that the conference will deliberate and discuss all different facets of exciting topic and come up with recommendations which will be fruitful for the academicians, researchers and the society.

I wish the conference great success.

Prof. Satya Prakash Tewari
Mechanical Engineering Department
Indian Institute of Technology (BHU), Varanasi -221005



## Prof. Ajay Shekhar Pandey

I am pleased to know that Institute of Engineering & Technology, Dr. Rammanohar Lohia Avadh University is organizing "International Conference on Future Engineering (ICFE-2020).This conference will enable researchers from different domains to share their views on topics related to engineering in a common platform.

I am confident that this conference will indeed generate a lot of interest among the researcher to explore and pursue the area of research. My best wishes to the organizers of the conference.

Prof. Ajay Shekhar Pandey
Department of Electrical Engineering
KNIT, Sultanpur

## Dr. Yogesh Kumar Chauhan

It gives me an immense pleasure to know that Institute of Engineering & Technology, Dr. Rammanohar Lohia Avadh University is organizing International Conference on Future Engineering (ICFE-2020). I am sure that the interaction of participants throughout the globe, internationally renowned counterparts will go a long way in knowledge sharing to help Industry, Academia and Society to grow and to compete globally.

I extend my best wishes for the success of this conference.

Dr. Yogesh Kumar Chauhan
Department of Electrical Engineering
KNIT, Sultanpur

## Prof. Raj Kumar Tiwari

It gives me immense pleasure that Institute of Engineering & Technology is organizing an International conference on Future Engineering (ICFE-2020) during June 26-27, 2020 in the Department of Mechanical Engineering of IET, Dr. RLAU, Ayodhya.

The central theme of the conference is "Future Engineering''. ICFE provides an opportunity for meeting of International Researchers, Engineers, Scientist and specialist in various research and development field of engineering and technology. The conference offers a premise for global expert to gather and interact intensively on the various topics of Mechanical Engineering.

I am privileged to say that this conference will definitely offer suitable solution to the global issues and hope that the conference enhances professionalism and capabilities of all the participants which promotes towards the future advancement of technologies.

I appreciate efforts of all the members of organizing committee of the conference for selecting such a theme and for organizing this event.

I wish the conference a grand success.

Prof. Raj Kumar Tiwari
(Ex. Director IET)
Department of Physics & Electronics
Dr. Rammanohar Lohia Avadh University, Ayodhya

## Prof. Ashok Kumar Shukla

"Future Engineering" is the term to satisfy the swiftly developing need for cutting edge engineers, we look for to outfit you with interdisciplinary exploration orientation and contemporary industry assortments of abilities to reform engineering design experiences and solutions.  It is indeed a very relevant topic to have consultation and deliberation in this era. Applaud the team for selecting such a theme for the conference and hope the International Conference will be a successful event.  I am sure that this conference will deliver its intended purpose. I wish the team of FE2K20 all the success.

Prof. Ashok Kumar Shukla
Department of Business Management & Entrepreneurship
Dr. Rammanohar Lohia Avadh University, Ayodhya

## Prof. C.K. Mishra

It is a matter of immense pleasure that the First Online International Conference is going to organizing by Department of Mechanical Engineering, Institute of Engineering & Technology, Dr. Rammanohar Lohia Avadh University, Ayodhya. This conference is very opportune and the organizers have rightly chosen the theme of "Future Engineering".

I appreciate that a Souvenir is being published on this occasion. I belief that the Souvenir shall have the abstract of research papers and academic achievements of the relevant fields. The deliberation of the conference will certainly benefit the society as a whole.

I wish the conference and publication of Souvenir a grand success.

Prof. C.K. Mishra
Head, Department of Mathematics & Statistics
Dean, Faculty of Science
Dr. Rammanohar Lohia Avadh University, Ayodhya

## Prof. Ram Lakhan Singh

The conference is an international platform for sharing new perspectives in the areas of Engineering. Many educators share their experiences, practices, and perspectives to accelerate educational changes in the environment of today's world that is always in a state of flux. The papers, discussions, and interactions during the conference will bring forth multiple viewpoints and address issues of critical importance.

My best wishes to all participants of the conference to make the most out of this event by learning innovative and advanced technologies.

Prof. Ram Lakhan Singh
Vice Chancellor
Nilamber Pitambar University Medininagar Palamu, Jharkhand

## Prof. R.N. Rai

I am extremely happy to know that the First Online International Conference is going to organizing by Department of Mechanical Engineering, Institute of Engineering & Technology, Dr. Rammanohar Lohia Avadh University, Ayodhya. Interdisciplinary approach in engineering can determine real time problems and furnish a diverse perspective to research area. The theme "Future Engineering" chosen for the conference is very appropriate in the recent scenario. I believe that the deliberations in this International conference will help researchers from academic and Industry to form a decisive insights and valuable understanding for research.

I extend my best wishes for the success of the conference and publication of the Souvenir.

Prof. R.N. Rai
Department of Business Management & Entrepreneurship
Dr. Rammanohar Lohia Avadh University, Ayodhya
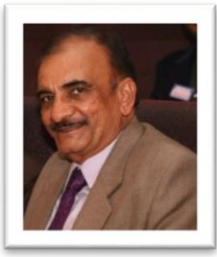
## Prof. Jaswant Singh

Being the Member of the Advisory Board of the "International Conference on Future Engineering (ICFE-2020)", I am honoured and delighted to welcome you all to the Conference is going to be organized during June 26-27, 2020 at IET, Dr. Rammanohar Lohia Avadh University Ayodhya, India. I am extremely happy that Future Engineering -2020 has been designed to impart comprehensive knowledge and information to the participants through various range of technical sessions that includes Trends and Emerging Techniques such as Energy and Green Technology, Environmental Engineering, Nanostructures and Nano-materials, Renewable Energy Sources. I am highly optimistic that the scientific program of the Future Engineering -2020 will pave a way to gather scientific visionaries through their research talks and presentations and will also put forward many thought provoking strategies for future line of action in the area of Future Engineering and Technology.

I hope the conference will be of professional and personal benefit to all of us. I extend my best wishes for great success of the conference.

Prof. Jaswant Singh
Department of Environmental Sciences
Dr. Rammanohar Lohia Avadh University, Ayodhya

## Prof. H.S. Singh

The conference titled International conference on Future Engineering (ICFE-2020) provides a platform for discussions on various technical topics related to engineering. This is a conference of international significance. The proceedings represent scholarly work of advanced and innovative thinkers and educators from around the world. It is felt that it is only through the exchange of information that one can hope to keep up with the rapidly changing world around us. I wish all the delegates, a great educational and informative experience at the conference.

My best wishes to the organizers of the conference.

Prof. H.S. Singh
Department of Business Management & Entrepreneurship
Dr. Rammanohar Lohia Avadh University, Ayodhya

## Dr. Shailendra Kumar Verma

It is my great honor and pleasure to invite you to participate in the International Conference on Future Engineering during June 26-27, 2020 at IET, Dr. Rammanohar Lohia Avadh University Ayodhya. The aim of the conference is to bring together new researchers, scientists, students and Industry professionals students from around the world, providing them with the opportunity to report, share, and discuss scientific questions, achievements, and challenges in this field. Many delegates from around the world will exchange new ideas, to establish business or research relationships and to find global partners for future collaboration. This is the place to do it.  So, make your plans to join us in this wonderful Conference.

Welcome and best wishes, I look forward to meeting you all.


Dr. Shailendra Kumar Verma
Department of Business Management & Entrepreneurship
Dr. Rammanohar Lohia Avadh University, Ayodhya

## Dr. Anil Yadav

I am honoured and delighted to welcome you to the International Conference on Future Engineering, going to be held during June 26-27, 2020 at Institute of Engineering & Technology, Dr. Rammanohar Lohia Avadh University Ayodhya, with the collaboration of Mazedan International Research Academy. I am extremely happy that Future Engineering 2020 has been designed to offer, comprehensive range of session that includes Artificial Intelligence Technologies, Nanotechnology, 3D Printing & Design, Electric and Hybrid Vehicles, Advanced Materials, Renewable Energy Sources, System Integration and Automation & Robotics. I hope you have a good time and opportunity to connect with expertise from scientific community and influential entrepreneurs through their lectures and presentations and will also put forward many thought provoking strategies on the traditional and advanced technologies in the field of Future Engineering.

I am looking forward to meet all of you through Virtual Mode in June, 2020 to make Future Engineering conference a grand success.

I would like to express my appreciation to the Conference Organizers for making this extraordinary conference a possibility.


Dr. Anil Yadav
Department of Physics & Electronics
Dr. Rammanohar Lohia Avadh University, Ayodhya

## Dr. Vijayendu Chaturvedi

I am glad to be the part of the International conference on Future Engineering (ICFE-2020). The events in the conference are targeted towards researchers, practitioners, professionals, educators and students to share their experience, innovative ideas, issues, recent trends and future directions in field of Engineering and Science and Technology.

Finally, I congratulate the team members and participant for their efforts in organizing and participating in this conference and wish the conference all the success.

Dr. Vijayendu Chaturvedi
Department of Mass Communication & Journalism
Dr. Rammanohar Lohia Avadh University, Ayodhya



## Dr. Vibhash Yadav

It gives me an immense pleasure to be a part of the International Conference on Future Engineering (ICFE-2020). I strongly believe that this conference will provide tools and knowledge to overcome significant problems appearing in our industry and society by identifying innovative ideas and technologies introduced by the researchers and students.

The success of this conference will encourage us in introducing many more initiatives for innovative trends in the coming years. I wish the ICFE-2020 a great success.

Dr. Vibhash Yadav
Department of Information Technology
Rajkiya Engineering College, Banda

# Message from Convener

### Nitesh Kumar Dixit

International Conference on Future Engineering is jointly organized by IET, Dr. Rammanohar Lohia Avadh University, Ayodhya, Dr. AIT Bangalore and Mazedan International Research Academy on 26-27 June, 2020 in the holy city of Ayodhya. This conference is in accomplishment of Department of Mechanical Engineering. On behalf of the International Conference on Future Engineering (ICFE-2020) Committee, I am honored and delighted to welcome you to the International Conference on Future Engineering (ICFE-2020), which provide a platform to stakeholders from around the world to share their knowledge, research findings and to explore future trends in various areas of engineering and technology.  It has been privilege to serve as the Convener of this conference "ICFE-2020" and also it is my great pleasure to present the abstracts booklet of proceedings of the International Conference on Future Engineering (ICFE-2020). In the situation of global pandemic  the above online international conference has brought together a great and affluent variety of researchers and speakers from universities, technical Institute, government organization and industry to share their thoughts and new frame of mind on a wide range of area such as 3D Printing & Design, Computer-Aided Design and Product Development, Artificial Intelligence, Electric and Hybrid Cars, Tribology, Renewable Energy Sources, System Integration and Automation, Networking, Computer Science, Mechanical and Materials Engineering research and Technologies.

For this First edition of the online international conference, we have received more than two hundred articles including regular and invited submissions and only hundred fifteen research articles have been accepted after review. These have been presented in different categories of online oral sessions, poster sessions and invited talks.

As the convener of the conference, I extend my gratitude to our Honourable Vice Chancellor, Prof. Manoj Dixit Sir for his vision and leadership. His involvement with originality has triggered and cherished my intellectual maturity that will help me for a long time to come. I am grateful to our Honourable Pro Vice Chancellor, Prof. S.N. Shukla Sir, Honourable Chairman BoG, Prof. P.B. Sharma Sir & Honourable Director, Prof. R.P. Mishra Sir for his advice, supervision, and crucial contribution, as and when required during this conference.

I am obliged to Organizing Secretary Members, Mr. Dilip Kumar, Mr. Ashish Kumar Pandey & Dr. T.N. Raju, for their kind support and concern during conference. Finally I would like to thank advisory members, institute members, technical committee members, all the authors, volunteers, students and persons who directly or indirectly contributed to the conference. Without their cooperation and full support, this conference would not have been possible. Last, but not the least, I thank to the omnipresent God, for giving me the strength during the course of this conference.

We believe that ICFE-2020 will yield fruitful results by the notable participants. We hope that you will find the conference informative and enjoyable, and to take the opportunity to establish new international research collaboration.

Nitesh Kumar Dixit
Department of Mechanical Engineering
IET, Dr. Rammanohar Lohia Avadh University, Ayodhya

# Message from Organizing Secretary

## Dilip Kumar

It is my great pleasure to announce that the International Conference on Future Engineering (ICFE-2020) which took place at Institute of Engineering & Technology, Dr. Rammanohar Lohia Avadh University, Ayodhya, Uttar Pradesh, India on 26-27, 2020 was a grand success. It has been a real honour and privilege to serve as the Organizing Secretary of the conference.

ICFE-2020 provided international forums for Scientists and Engineers from academia and industry to exchange and share their experiences, research results, and new ideas emerging topics in engineering field. We thank our Honourable Vice Chancellor Prof. Manoj Dixit Sir for his vision and leadership. The conference would not have been possible without the enthusiasm and hard work of my colleagues. We are also grateful to all the members of the Technical Committees, the General Chair, and to all the reviewers for the quality and depth of the reviews, and their sense of responsibility and responsiveness.

Dilip Kumar
Department of Electrical Engineering
IET, Dr. Rammanohar Lohia Avadh University, Ayodhya

## Ashish Kumar Pandey

Welcome to the city of the seven holiest cities of India, birthplace of Lord Rama and sacred Saryu River-Ayodhya. As an organizing Secretary of the first online International Conference on "Future Engineering" on 26th and 27th June, 2020, I would like to express my sincerest thanks to all guest and delegates in the magnificent and instructive program. I express my heartfelt gratitude to the Vice Chancellor Prof. Manoj Dixit Sir for his leadership and guidance. I hope by this conference a new path will be found for the teachers, students and researchers to contribute more and more to the sustainable development of the country.

I congratulate to my team, students and participants from our colleges and other colleges for making this conference successful and meaningful.

I wish the International Conference a great success.

Ashish Kumar Pandey
Department of Computer Science & Engineering
IET, Dr. Rammanohar Lohia Avadh University, Ayodhya

## Dr. T. N. Raju

As organizing secretary of the conference, I take great pride in welcoming all the attendees of the International Conference on Future Engineering on 26 and 27 of June, 2020. Due to the wide spread of COVID-19 across the globe, it has become increasingly difficult for students, academicians and researchers to meet and disseminate their knowledge and work among the research communities. In this regard Dr. Ambedkar Institute of Technology, Bengaluru, Dr. RL Avadh University, Ayodhya and Institute of Engineering and Technology, Ayodhya in association with Mazedan International Research Academy have initiated this online conference to assimilate the researchers across the globe to dispense their knowledge through online presentations and paper submissions.

The research on science and engineering conducted in academic institutions, industry, R & D Laboratories and elsewhere plays a vital role in raising our standard of living, creating jobs, improving health and providing for national security and development. Undoubtedly, this type of conference not only brings all the researchers, faculty, research scholars, industry personnel and students at one platform, but it also instills the research culture among the entire technical fraternity of education across the globe, thereby, contributing to the development of our nation and globe. I hope that you are rewarded by the technical challenges of the International Conference.

I look forward to an exhilarating week of insightful presentations, discussions, and sharing of technical ideas with research colleagues from around the world. I thank you for attending the conference and hope that you enjoyed this Conference.

I would like to extend my warm welcome to all of the presenter and participants, and in particular, we would like to express our sincere gratitude to our plenary and invited speakers.

Dr. T. N. Raju
Department of Mechanical Engineering
Dr. Ambedkar Institute of Technology, Bengaluru

# Program at a glance

| DAY, SESSION AND TIME | | | EVENTS |
|---|---|---|---|
| FRIDAY 26-06-2020 (Day-1) | FORENOON | 9.50AM-10.00AM | Inauguration- Opening of Conference,  Saraswati Vandana, Kulgeet |
| | | 10.00AM-10.15AM | Welcome Speech<br>*Prof (Dr.) R.P. Mishra (Director IET)* |
| | | 10.15AM-10.25AM | Conference                                                          Overview (Convener/Organizing Secretary) |
| | | 10.25AM-10.30AM | Opening of Proceedings Book<br>Prof (Dr.) Manoj Dixit (Honorable VC) |
| | | 10.30AM-11.00AM | Plenary Talk<br>*Prof (Dr.)* Manoj Dixit (Honorable VC) |
| | | 11.00AM-11.50AM | Keynote-1<br>*Dr.* Sunil Kumar Sharma, *Changwon National University South Korea* |
| | | 11.50AM- 12:40PM | Keynote-2<br>*Dr. Lalit Kumar Singh,* NPCIL, Bhabha Atomic Research Center |
| | | 12.40PM-12.45PM | *Vote of Thanks*<br>(Organizing Secretary/Convener) |
| | | 12.45PM-12.46PM | *National Anthem* |
| | | BREAK | |
| | AFTERNOON | 1.00PM-3.00PM | Technical Session-1 (ME-DESIGN)<br>*Session Chair- Prof. Prashant Kumar Singh & Prof. Palvita Yadav* |
| | | 1.00PM-3.00PM | Technical Session-2 (EE&EC)<br>*Session Chair- Prof. Shekhar Yadav & Prof. Abhinav Gupta* |
| | | 3.00PM-6.00PM | Technical Session-3 (ME-MATERIALS)<br>*Session Chair- Prof. Nitesh Dixit & Prof. Manish Dixit* |
| SATURDAY 27-06-2020 (Day-2) | FORENOON | 10.00AM-10.50AM | Keynote-3<br>Dr. Jun Wang, Peter Lynch at Institute for Frontier Materials of Deakin University, Australia |
| | | 10.50AM-11.30AM | Keynote-4<br>Dr. Ashish Das, National Institute Of Technology Jamshedpur |
| | | 11.30AM-11.45AM | *Vote of Thanks*<br>(Organizing Secretary) |
| | | BREAK | |
| | AFTERNOON | 12.00PM-1.30PM | Technical Session-4 (CSE & IT)<br>*Session Chair- Prof. Vibhash Yadav & Prof. A.K Pandey* |
| | | 12.00PM-1.30PM | Technical Session-5 (Civil & Environment)<br>*Prof. Hemant Kumar Singh & Prof. Sasi Kumar* |
| | | 1.30PM-4.00PM | Technical Session-6 (Software Design)<br>*Session Chair- Prof. Gamini Joshi, Prof Zaineb Naaz* |
| | | 4.00PM-4.30PM | Closing of the Event |

# Advisory board

| | |
|---|---|
| Prof. Rajeev Srivastava, MNNIT Allahabad | Prof. S.P. Tiwari, IIT BHU |
| Prof. S.S. Mahapatra, NIT Rourkela | Prof. Ajay Shekhar Pandey, KNIT, Sultanpur |
| Prof. Anoop Kumar Sood, NIFFT Ranchi | Prof.Yogesh Kumar Chauhan,  KNIT, Sultanpur |
| Prof. R.K. Tiwari, Dr. RMLAU Ayodhya | Prof. Ashok Kumar Shukla, Dr. RMLAU Ayodhya |
| Prof. C.K. Mishra, Dr. RMLAU Ayodhya | Prof. R.L. Singh, Dr. RMLAU Ayodhya |
| Prof. R.N. Rai, Dr. RMLAU Ayodhya | Prof. Jaswant Singh, Dr. RMLAU Ayodhya |
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| Prof. Santosh Kumar Tripathi, REC, Kannauj | Prof. Kamlesh k. Bharati, REC, Kannauj |
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| Prof. Sandeep Kumar Singh, VBS Jaunpur | Prof. Hemant Kumar Singh, VBS Jaunpur |
| Prof. Jyoti Vimal, MITS Gwalior | Prof. P.K. Bharti, Integral University Lucknow |
| Prof. Ashiwani Kumar, FGIET Raebareli | Prof. Tarun Bhardwaj, KIET Ghaziabad |

# Keynote speakers

## Dr. Lalit Kumar Singh

Dr. Lalit Kumar Singh received his Ph.D. degree from Indian Institute of Technology (Banaras Hindu University). He has experience of more than 20 years and currently a Scientist in NPCIL-BARC, Department of Atomic Energy, Government of India, since 17 years, and has distinction of working on Pressurized Heavy Water Reactors (PHWR) and Light Water Reactors (LWR). He has an illustrious career and succeeded in several critical jobs assigned to him in his illustrious career, though, each of them was challenging. His assignments over the years range from design, development, testing, IV&V, related research and site validation of the safety critical computer based systems of Indian Nuclear Power Plants. He has published several research papers in journals of high impact factor like IEEE Transactions, IEEE Computer, ACM, Elsevier, Quality & Reliability International, etc. He has been invited for chief guest, keynote speeches, session chair and talks in many international conferences, short term courses, workshops & faculty development programs from many IITs, NITs & other institutes of national importance. He is recipient of many awards like publication award, group achievement award, etc. He is a reviewer of several SCI indexed journals of high impact factor. He is a life member of Indian Nuclear Society. He is a member of editorial board of many reputed journals and guest lead editor of many special issues. He is supervising many PhD students of different IITs, NITs and is PhD thesis examiner of IITs, NITs and other reputed institutes. He is an expert member of Industrial policy formation of IIT Ropar, BoS of many autonomous institutes and member on the advisory board of many institutes/universities. He is a reviewer and project collaborator of Research proposals of Board of Research in Nuclear Sciences (BRNS). He is also faculty of Nuclear Training Centre, Department of Atomic Energy, Government of India. He is interfacing with other countries, like Russia, USA, France, etc. for importing nuclear reactors that are based on new technologies. His research interests are in the area of reliability, safety and security of safety critical computer based systems. So far he has completed 33 projects of Department of Atomic Energy, Government of India.

## Dr. Jun Wang

Dr. Jun Wang is an Associate Research Fellow currently working with Prof. Matthew Barnett and A/Prof. Peter Lynch at Institute for Frontier Materials of Deakin University, Australia. He obtained his Ph.D. in materials science and engineering in 2019 under the supervision of Prof. Matthew Barnett. He has been doing research aiming at solving some fundamental scientific problems and creating innovations in lightweight alloys. The ultimate goal is to promote their application in aerospace, transport and mining sector, and to replace their heavier counterparts, which in turn enable energy and emission reductions. By now, He has published 20 papers in international peer-reviewed journals and has total citations of 271 and an H-index of 11.

## Dr. Sunil Kumar Sharma

Research Assistant Professor, PhD (Indian Institute of Technology Roorkee) Extreme Environment Smart Machinery Parts Design / Manufacturing Innovation Center, Mechanical Engineering Department Changwon National University South Korea

Dr. Sunil Kumar Sharma did his Master from MNNIT Allahabad and PhD from IIT Roorkee. He did his PhD in the field of mechanical vibration which are used in the evaluation of High speed rail vehicle. Later, he has joined Titaghar wagon limited as Manager Passenger coach design. Later he joined Post-Doctoral fellow at Changwon National University and started working in the area of structural health Monitoring using Ultrasonic. Now he is working as Research Assistant Professor in Changwon national university South Korea. Keynote topic: Ride Analysis of Indian Rail Vehicle using controlled semi active suspension system. The rail–wheel interaction in a rail vehicle running at high speed results in large amplitude vibration of carbody that deteriorates the ride comfort of travellers. The role of suspension system is crucial to provide an acceptable level of ride performance. In this context, an existing rail vehicle is modelled in vertical, pitch and roll motions of carbody and bogies. Additionally, nonlinear stiffness and damping parameters of passive suspension system are defined based on experimental data. In the secondary vertical suspension system, a magneto-rheological (MR) damper is included to improve the ride quality and comfort. The parameters of MR damper depend on the current, amplitude and frequency of excitations. At different running speeds, three semi-active suspension strategies with MR damper are analysed for periodic track irregularity and the resulting performance indices are juxtaposed with the nonlinear passive suspension system. The disturbance rejection and force tracking damper controller algorithms are applied to control the desired force of MR damper. This study reveals that the vertical vibrations of a vehicle can be reduced significantly by using the proposed semi-active suspension strategies. Moreover, it naturally results in improved ride quality and passenger's comfort in comparison to the existing passive system.

## Dr. Ashish Das

Dr. Das is working as the assistant professor in the department of production and Industrial Engineering, NIT Jamshedpur. Dr Das received his PhD from NIT Allahabad. The summary of the keynote is here-

Additive Manufacturing in Biomedical Field" Commonly known as 3D Printing, Additive Manufacturing (AM) is a suite of computer automated processes to fabricate three-dimensional physical objects layer by layer from CAD models. AM offers significant benefits over conventional manufacturing processes in producing one-of-a-kind parts or small batches, especially for those with geometric and/or material complexities. It holds great promise for the future as a toolless, light-out manufacturing technology for components and products made of metals, polymers, ceramics and composites. This talk will first give a brief overview of AM technologies along with their various possible applications in the biomedical field. Thereafter, possible applications of AM technologies in combating ongoing pandemic COVID-19 will be overviewed. Finally, future directions for research in these areas will be presented.

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PRESENTED ABSTRACTS IN THE CONFERENCE

# Improving the Capabilities of Folding Bridges in Traffic Engineering using Computer Vision

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## Abstract

The future of civil engineering is being redefined by the innovation in machine learning. Whether we talk about designing foundations that can detect and dampen the seismic waves on their own or we talk about designing a self-capable cricket stadium which uses a retractable roof to protect its pitches, the application of machine learning in civil engineering is revolutionizing the field. Thus, it is important to come up with ideas that not only improve the efficiency of civil engineering structures but also improve the livelihoods of people. With the advent of modern technology, we are capable of detecting objects remotely and using that information to modify the structure to facilitate the movement of the other object. Rather than being restricted to only this field this kind of remote detection can be used to avoid accidents, recognize traffic patterns and conduct mass surveillance. The study focuses on making the flow between highways and waterways more smooth. In particular, folding bridges need to consider both arterial and canal flow. In this study, sensors are placed at a viable distance according to the speed limit of the mode of transport which triggers the camera that takes the photo of the oncoming automobile. This photo is preprocessed and fed to the VGG16 Pretrained Model which gives us the nature of the image depending on which the bridge automatically folds and makes way for a vehicle that has a more crucial task to handle.

## Keywords

Flow and concentration of traffic, machine learning, remotely, retractable roof, seismic waves, VGG16 Pretrained Model

# A Comprehensive Study of Artificial Neural Networks

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## Abstract

Artificial Neural Networks- basically a concept, known from the field of biology where a neural network plays a principal and key role in the human body. A neuron is a unique and special biological cell that has the responsibility of information processing from one neuron to another with the assistance of chemical change and some electrical change also. It is comprised and composed of a cell body. And outreaching branches (tree-like) of two types. A nucleus which contains some information regarding hereditary traits and plasma neurons that has a hold of the molecular instruments for supplying the important materials required by the neurons, are the constituents of the cell body. Artificial neuron is primarily an engineering approach of a biological neural network or neuron. Artificial Neural Networks are rapidly developing since they have been introduced to the world in the mid of the 20th century and according to science in our present time, we have explored the advantages of the neural networks and the problems which have occurred in the course of their creation. Also, the way the disadvantages and limitations of the artificial neural networks, although it being a developing branch of science and technology, are being eliminated and their advantages are being increased as per time, shouldn't be ignored. Soon, they'll become an indispensable part of our daily lives. Now, the prediction of what will be the clinical result of the patients suffering from breast cancer and who have undergone surgery plays an important part in the medical field such as the planning of further treatment and the accurate diagnosis of the disease and its progression. Currently survival predictions are estimated by the doctors using techniques which are non-numeral.

## Keywords

Keras, MLP, Neural Network, Invasive Ductal Carcinoma

# Advertising and Spams: How to Recognize the Lie and Reality in Social Media

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## Abstract

Today's trend towards "authenticity" marks a welcome u- turn on the long road towards showy, false advertisement and spams on social media. The social media's main characteristics are low entrance barriers, quick feedback (so instantaneous gratification), and huge amounts of friends, open channels and privacy. The two last assets render us confident and open to behavior with poor motives, which also make social networking sensitive. Social networks are a form of deceit. Failure is a failure to deceive individuals, consultants, associations, etc. This report seeks to examine the effect on social networks of fake advertising, misleading facts or dissatisfaction.

## Keywords

False Advertising, Misleading information, Authenticity, Social Media, Spams, Deception

# AI In Agriculture Using UAV to Detect Weeds

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## Abstract

To keep track of agronomic and environmental variables, UAV's have displayed a tremendous capabilities by capturing pictures at High spatial resolution. Ground-control-points (GCPs) must have to obtained to make sure the precision of the mosaicing process. This study was put through into wheat field naturally overspread by grass leaves and big-leaved at large initial phenological level. UAV flying at altitudes of 30 to 100 m and using a large number of GCPs (15 to 60) , ultra-high spatial resolution ortho-images is able to give rise to ultra-high spatial resolution ortho-images can be generated with the geo-referencing precision necessary to map small weeds in the field of wheat at very initial phenological stage. 1 acre field was divided into 4 sub-fields equally, 15 GCP's of different colour configurations were placed in each 4 sub fields providing a precise percentage of weeds in each sub fields detected using UAV. The outcome of the weed detection would give out the exact usage of the pesticide as per the weed detected (%) in each 4-sub field rather than, spraying the pesticide on the whole entire field.

## Keywords

Image Processing, Sensor, UAV, Weed, GCPS, Flight Range

# Analysis of Concrete Filled Steel Tubular Columns under the Axial Loads -A Review

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## Abstract

This study focuses on modelling of concrete filled steel tubular columns under Axial loading. The main parameters of FEA are circular and square columns with grades of Concrete M20, M30 and M40. It is concluded that the deformation of the column is decreasing 10-15 percentage with increasing grade of concrete. The deformation was influenced by the shape of CFST section. This study is an investigation of the behaviour of circular and square concrete filled steel tube columns under axial loading. Parametric study of 12 CFST columns was performed using finite element analysis. The numerical model was employed to investigate the effects of four parameters including the concrete compressive strength, loading eccentricity ratio, depth-to thickness ratio and columns slenderness ratio on the structural performance of high strength thin-walled rectangular CFST slender beam-columns in terms of the strength factor, steel contribution ratio and strength envelopes.

## Keywords

Axial loading, Steel tubular columns, Finite Element Method, Nonlinear analysis, CFST.

# Experimental and Analytically Study of Spliced Connection of the steel- A Review

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## Abstract

Studied of Hallow Tabular Section (HTS) as members was not to be used in the construction of trusses only, but in past, it was studied of hollow tubular sections was used as a structural member in moment resisting steel frames due to ease of erection and cost-effectiveness compared to the regular open sections. Therefore, beam connections has been a major topic in the field of steel structure design calculation research such as connection are bolted-bolted, bolted-welded & welded-welded connections which has been sufficient inelastic rotation capacity. This behavior of connection was studied through experimental, numerical and analytical investigation. A substantial study was available on the behavior of hallow tabular section plastic moment & end plate connections. Most of the work was done on beam-column joints connecting regular steel sections subjected to different types of loading such as tensile, seismic, cyclic, etc., it shows moment end plate connections connecting steel hollow tubular section is very limited. Estimating three modeling terms are available analytical, mechanical models, and advanced finite element models study usually feature for the calculation of hallow tabular section which shows advantages of use & cost. From the upper introduction, it has performed on end-bolts, beam columns joints & beam to beam connections for various purposes. From that, it has conclude to work with Aluminium & Mild Steel (Hollow Sections): square, rectangular, circular for different depths for spliced connections. To perform the experimental tests on UTM machine with comparatively carrying analytical method to evaluate the same results.

## Keywords

Hollow tubular sections, finite element, plastic moment, end plate connections

# A Review on High Performance Concrete under Compression

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## Abstract

High performance concrete (HPC) has developed popular in current years. High Performance Concrete (HPC) nowadays used extensively in the construction industry worldwide. For achieving the properties of HPC with normal ingredients use of mineral admixtures like Silica fume, fly ash and workable agents Super plasticizers used. The use of local materials is a fundamental step to save materials and energy and decrease the cost of concrete Ultra-High Performance Concrete (UHPC) is considered to be one of key advances in concrete technology with superior qualities, i.e. high fluidity, over 150 MPa compressive strength and excellent durability. Ultra-High-Performance Concrete (UHPC) is an advanced type of concrete that can increase the durability and resilience of concrete structures. However, mix proportioning of HPC is a most critical process than normal strength concrete (NSC). Mix design methods of NSC are indirectly applicable for designing HPC mixes. High performance concrete (HPC) is that concrete which meets special performance and uniformity requirements that could not be always achieved by normal materials, placing, and curing practices. This can be achieved only by controlling w/c ratio and addition of mineral as well as chemical admixturesSilica-fume (SF) and ground granulated blast-furnace slag (GGBS) were pozzolanic materials that used in this study. The influence of combination of crushed waste glass powder (GP) and ground granulated blast furnace slag (GGBS) as a partial replacement in cement is observed, on the behaviour of mechanical and durability properties of concrete .In material observe that The packing of fine aggregate affect the properties of HPC. It also observe that the fine aggregate packing the better are the workability, compressive strength and water tightness, and with that the frost and chemical resistances under sufficient paste content.

## Keyword

High performance, Concrete, Admixtures, Compressive strength, workability, Mix Design, Materials.

# Replacement of Conventional Bars with Fiber Bars in Reinforced Concrete Columns-A Review

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## Abstract

An Experimented study of different properties of reinforced concrete specimens under the performance of high temperature. Studied the mechanical behavior of concrete specimens (prisms) reinforced with steel and GFRP bars. Investigated bond properties between FRP and normal concrete core when immersed in salt solutions. Various tests conducted on FRP reinforcement in specimen which are compression tests, pullout test, and flexural test and splice test. Investigated the effect of distilled water and alkaline condition on the durability of glass fiber bars. Observed FRP reinforced section show more deformations before specimen failure. Compression behavior of reinforced column specimen studied. The influence type of reinforcement, spacing of stirrups and loading condition (concentric, eccentric) on the performance of specimens were investigated. The gain in tensile strength, post cracking strength and toughness was reported. Focused on the structural behavior and the performance of concrete column internally reinforced with glass fiber reinforced bars. The mechanism of failure was explained. The increase in strength and ductility were recorded for reinforced columns. A comparative study between steel and fiber reinforced concrete column was reported. Studied the relation between axial load capacity of concrete column and glass fiber for different reinforcement ratio. The study involves work can be done in the field, it will give desirable strength. It will be good replacement to eliminate the corrosion problem.

## Keywords

Axial loading, Column, Concentric load test, Eccentric loading, FRP

# Recognition of Epileptic Seizures based on the Rhythms of EEG

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## Abstract

With enormous developments in the technology of neuroimaging, there is a great explosion of neuroscience data. Many scientific researchers and neuroscientists investigate the data to attain in-depth comprehension of the network of human brain. Electroencephalography (EEG) exploits brain signals in a scientific and systematic manner. EEG measurement plays a dominant role in the studies related to the brain. It plays a vital role in detecting, displaying and recording electrical activity of the brain. EEG signal analysis is supreme for diagnosis of brain related issues like dementia, epilepsy, Alzheimers and seizure disorder. Till this day it is often analyzed manually by the experts. Thus there is an increasing desperate need to develop techniques of classifications which helps to distinguish EEG rhythms and to declare the healthiness of a person. In this work, we focus to establish methods for the exploration of epileptic EEG signals which has been prominent to be well grounded evaluation of EEG.
Signal enhancement of EEG is carried out as follows:

- Aggregation of database (Data of brain signals).
- Denoising the signals and processing the data of EEG using algorithm.
- Algorithm development to investigate the signals in time-frequency.
- Categorizing the EEG signals by frequency analyzing.
- Processing of signals and analysis is done using MATLAB (INTLAB)

The analysis mainly focuses on forecasting the events, identifying the samples and diagnose abnormalities in the sampled data. The evaluation is done using INTLAB which is the MATLAB Simulink toolbox to demonstrate the accuracy of the algorithms. To estimate the precision of the computation of the profound design, Realtive error (RE) and the power spectral analysis (PSD) is used.
The results convey that the proposed technique reveal categorization accuracies which has been processed using MATLAB toolbox (INTLAB).

## Keywords

EEG, FFT, PSD, RE, MATLAB, INTLAB

# Trajectory path planning in Indoor Surveillance Drones to assist blind

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## Abstract

Autonomous drones having the ability of reaching areas like forest region, hilly region and areas with rough terrain, is being used today for different application with surveillance being the mostly widely explored specifically for societal welfare. The limited battery life of a drone is a matter of concern and has restricted the adoption of drones into any application. Moreover since battery life of drone is inversely proportional to the size of drone, utilizing nano drones by minimizing its energy consumption is itself an immerging area of research today. In addition to the size of drone, trajectory path planning for drone plays a major role in the amount of energy consumed by drone. Here we address the trajectory planning problem for optimizing a nano drone flight, designed specifically for indoor surveillance to assist a blind person. Drone trajectory planning using camera mounted on drone, involves challenges like choosing optimal path among the many path options available between source and destination, overcoming blind spots in the drone vision, energy conservation and efficiently plan of charging stations in the drone flight zone. We propose a formula to calculate the number of charging stations in the drone flight zone depending on the drone capacity and the room dimension. We also propose the use of existing A* algorithm to assist in trajectory path planning by computing the shortest path between any given source and destination of the drone flight, and thereby use optimal energy for the flight of the drone. The choice of using a nano drone is driven by its ability to be used without causing any physical harm in an indoor environment, and also make less noise since its main purpose is surveillance. Drone mounted with camera which is frequently termed as "Eye in the Sky" is proposed for blind assistance, as drones can provide visual assistance by monitoring and surveillance to a visually impaired person. The drone would be able to assist the blind person by identifying any unusual activity in its environment, like a movement of a snake in the room or suspicious person entering into the room and thereby given an alert to the visually impaired person. The movement of the nano drone is governed by the proposed algorithm which would assist the drone in taking shortest path between the source and destination and thereby minimize the consumption of energy.

## Keywords

Drone, Blind Assistance, Trajectory Path

# Quality Assessment of Images Using Deep Neural Network and Image Pre-Processing Techniques

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## Abstract

Image quality analysis has become a very common topic because of its use in many applications like remote sensing, human perception, medical analysis etc. Analysis of image quality is a subjective problem and it can be resolved very easily by humans but for computers, it is a very tedious task to provide accurate results. The need of an automated image quality analysis model cannot be ignored as it has many applications in different fields and on a large scale, an automated quality analysis model is necessary to perform all the work. Recently, many works have been already done on the analysis of the quality of the images but the problem with the existing work is the less correlation of the quality score with human perception that leads to poor generalization power. This work deals with a model for assessing image quality by employing image pre-processing techniques prior to applying a deep convolutional neural network with custom architecture. The proposed architecture is able to classify the images into two classes based on the quality of the image. The dataset on which analysis has been done is a part of the multi-class dataset Aesthetic Visual Analysis (AVA). As a pre-processing techniques the images are first cropped to lower dimensions with correct values in the score file and the weighted average value of the scores has been considered to shift  from multi-class classification to two-class classification. Results obtained by using the custom architecture shows that the proposed custom model outperforms existing models that perform similar type of classification on AVA dataset.

## Keywords

Image quality assessment, Stochastic Gradient Descent (SGD), Convolutional Neural Network

# Diagnosis and Prognostication of Alzheimer's Disease Based on Longitudinal MRI data Using Imputation and Ensemble Machine Learning Approach

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## Abstract

Alzheimer's disease (AD) is a progressive neurodegenerative brain syndrome which affects nerves, brain cells, and neurotransmitters. It is the most commonly known type of dementia that affects brain functions, behaviour, memory, and thinking ability. In recent times, there has been a critical rise in AD cases all around the globe. The 2019 World Alzheimer Report, estimated 131.5 million dementia cases by the year 2050 worldwide. As of 2018 statistics, till now 44 million people have undergone AD and other related dementia disorders globally. The disease causes tremendous challenges to the health care system. In spite of its significance, so far there is no remedy for it. Thus, early and timely diagnosis of AD is indispensable for patient care and related research studies. Numerous tools and techniques have been employed to diagnose AD since diagnosing it in its initial stage is of incredible importance. MRI (Magnetic Resonance Imaging) is one of the imaging approaches that efficiently aid in the AD diagnosis. Machine learning (ML) classifiers have been efficiently employed in the automated analysis of AD. A persuasive procedure in ML to boost the performance accuracy of conventional base algorithms is to construct classifier ensembles. There are a number of classifiers in the ML literature which are problem-oriented and are used to predict and further improve the accuracy of employed classifiers. In the present study, we show and compare AD diagnosis methods using imputation and non-imputation technique employing Random Forest ensemble ML classifier. Data used in the preparation of this study were acquired from the Open Access Series of Imaging Studies (OASIS) database. We studied 150 subjects for 373 MRI sessions, aged between 60 to 90 years. The dataset included many missing data. To handle the missing data, we applied imputation methodology. We used an ensemble technique to predict whether or not the subject is experiencing AD from longitudinal-based MRI data, centred on two distinct approaches in order to deal with the missing data. Upon comparison among the two applied approaches, the Random Forest imputation-based model exhibited higher performance than the Random Forest non-imputation-based model.

## Keywords

Alzheimer's disease, diagnosis, ensemble, imputation, machine learning, missing data

# Studies on Mechanical Properties and Finite Elemental Analysis of Non-Asbestos Corrugated Cement Roofing Sheets

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## Abstract

Asbestos is a fibrous material which is widely used in making corrugated cement roofing sheets owing to its desirable qualities like good strength, flexibility, resistant to heat, chemicals, electricity and water absorption. On the other hand, when the asbestos dust particles are inhaled they are injurious to health. Thus the usage of asbestos is restricted or even banned in many countries. In this work, Non-Asbestos corrugated cement roofing sheets was prepared by using Fly ash, used foundry sand, Bamboo fiber, synthetic poly polypropylene fiber and Portland cement. The reinforcement materials that were used in this work are non-toxic, low cost and are easily available. Three samples of non-asbestos corrugated cement sheets namely; Sample-A, Sample-B and Sample-C were prepared with three different combinations of the reinforcement materials. The mechanical properties like impact test, water absorption test and bending test was conducted on the prepared sheets. From the experimental results, sample-C has shown better results when compared to the other samples. Finally, using ANSYS 15.0, the stress- strain relationship of the sheet was also analyzed by applying a load of 2500N/m. The FEA results revealed a very nominal amount of displacement, proving the load bearing capacity of the prepared non-asbestos corrugated roofing sheets.

## Keywords

FEA, Non-Asbestos, Mechanical test

# Design and Validation of a Positive Interlocking System to Secure Orientation between Turbocharger and Exhaust Throttle Valve for BS-VI Applications

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## Abstract

A turbocharger is a forced induction device used as a charge booster for diesel engine vehicles. The Exhaust Throttle Valve (ETV) is used for the thermal management of the after treatment system. In engine assembly process, the ETV is assembled to the turbine outlet of turbocharger at a specific orientation through a V-band coupling. The operator faces many issues while aligning and orienting the ETV with the turbocharger which results in functionality and reliability failures of critical components. To overcome this issue, a positive interlocking system is designed which will locate and interconnect the assembly at specified orientation. The interlocking system design is confirmed for given loading conditions by performing its Thermo-Mechanical Fatigue analysis. The results of interlocking system are validated experimentally by the engine assembly and endurance test. Thus, this research presents a robust interlocking system for securing the ETV orientation in engine assembly for BS-Ⅵ applications.

## Keywords

Exhaust Throttle Valve, V-band coupling, Thermo-Mechanical Fatigue analysis

# Developments in Intelligent Tutoring Systems 2010-2020: A Literature Review

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## Abstract

Intelligent Tutoring Systems (ITS) vary a lot in the architecture employed, the realization of domain knowledge, the student modelling techniques, the pedagogical techniques and in numerous other aspects. This literature review attempts to highlight the key theories and implementation technologies adopted in the design and development of ITSs during the period under review.

## Keywords

Intelligent tutoring system, Adaptive learning, Literature review

# A Novel Study on Material Dispersion around Zero Material Dispersion Wavelength

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## Abstract

At the present age when the Optical Fiber based communication system is the base of long haul communication, huge research is going on to improve the still prevailing constraints of the optical fiber based communication. Considering all the issues the best wavelength for communication is settled at 1.55 µm. But for conventional pure silica based Single Mode Fiber has Zero material dispersion wavelength (ZMDW) at 1.27 µm.For a better communication a compromise between the loss and dispersion is a matter of Engineering and a continuous research is going on to settle the matter in most affordable way.

Our study on known composition 'material' based optical fiber has produced both the types of results. Some fibers are producing better response and some are not. Here we have studied some doped fibers to find a fresh and effective alternative. We have taken samples of Doped glass Fiber and different fluoride glass fibers. In this study we have determined the ZMDW of different fibers and find the flatness of material dispersion.

## Keywords

Doped Optical Fiber, Fluoride Glasses, Zero Material Dispersion Wavelength (ZMDW)

# Performance Evaluation of Double Pass Solar Water Heating System Using Reflector

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## Abstract

Solar energy is the alternative source of renewable energy and it is unlimited, easily available all where. Due to increasing demand of energy, the unconventional energy sources are in situation of crisis. In order to reduce the energy crisis, the use of solar energy has increased considerably and every day new technologies are being discovered to increase its efficiency. Double pass solar water heater with reflector is new invention in the field or solar water heater which enhances the efficiency and overall performance of solar water heater. In the present work the glass is used as reflector and water is made to flow twice. By doing so the absorber tube absorbs the radiation two times so the water is much heated comparison to one-time flow. Here in this work we have discussed and compared single pass solar water heater with double pass solar water heater with reflector on the basis of its performance and efficiency.

## Keywords

Solar energy, double pass solar water heater, reflector

# Structural Health Monitoring of Bridge Submerged in Flood

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## Abstract

Bridges can be subjected to damaging environmental actions due to flooding. Flood actions that result in scour are a leading cause of bridge failure. When scour can lead to effects that depend on the governing scour condition affecting a bridge. Loss of stiffness under scour can reduce the ductility capacity of a bridge but can also lead to an increase in flexibility that may reduce. Conversely, increased flexibility can lead to deck collapse due to support loss, so there exists some uncertainty about the effect of flooding. A necessary step towards the performance assessment of bridges under flooding actions is to calibrate numerical models that can reproduce structural responses under different actions. A further step is verifying the achievement of performance goals defined by codes. Structural health monitoring (SHM) techniques allow the computation of performance parameters that are useful for calibrating numerical models and performing direct checks of performance goal compliance. In this report, various strategies employed to monitor bridge health against scour actions are discussed. This study also represents analysis of bridge design using Staad-Pro; to checks it bending moment, shear force, deflection and analysis of a bridge deck.

## Keywords

Structural health monitoring, scour, bridge deck, Staad-ProV8i

# Flow of SA Based Nanofluid during Spin Coating

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## Abstract

In this paper, we have discussed the behavior of the flow and film thickness variation of non-newtonian nanofluid during spin coating process. In case of non-newtonian fluid the viscosity is not a constant term. For non-newtonian fluid the viscosity and solvent diffusivity are dependent on polymer concentration. In this article, we are taking silver and copper as a nanoparticle and sodium alginate as a non-newtonian base fluid. Here we investigate the behavior of the film thickness for different parameters such as initial film thickness, angular velocity of the rotating disk, volume fraction of the nanoparticle etc.

## Keywords

Non-Newtonian Nano fluid, nanoparticle, spin coating

# Study of Electric Discharge Machining

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## Abstract

High residual thermal stresses are developed on the surfaces of Electric Discharge Machined parts because of the high temperature gradients generated at the gap during Electrical Discharge Machining (EDM) in a small heat-affected zone. These thermal stresses can lead to micro-cracks, decrease in fatigue life and strength and possibly catastrophic failure. The results of the analysis show high temperature gradient zones and the regions of large stresses where, sometimes, they exceed the material yield strength. A transient thermal analysis assuming a Gaussian distribution heat source with temperature dependent material properties can be used to investigate the temperature distribution. In this paper basic review is presented based on different parameters and various methods applied by others to estimate the temperature distribution and thermal stress analysis.

## Keywords

Electrical Discharge Machining, Residual Stress

# A Brief Review of Data Mining Techniques

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## Abstract

Data innovation has reformed the entire world with less expensive and quick correspondence through various modes. Every one of these devices create heaps of information which should be prepared to extricate valuable examples of information or data. The database technologist are looking for intends to store, control and recover information while information mining region is endeavoring hard to track down new and proficient procedures for data extraction structure the tremendous measure of information. Data Mining is additionally alluded by the names like Knowledge Discovery in Database (KDD) or Predictive Analytics or Data Science. The different strategies utilized for extraction are hereditary algorithms, decision trees, artificial neural systems, enlistment and perception. Data mining is commonly an iterative and intelligent revelation process. The objective of this procedure is to mine examples, affiliations, changes, abnormalities, and measurably huge structures from huge measure of information.

## Keywords

Data mining, Knowledge Discovery, Database Techniques

# A  Geo Location Based Browser for Secured Mobile Banking

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## Abstract

With banks reaching its users via mobile banking,it is becoming one of the  essential feature that is demanded by almost evry smartphone user, mobile via a mobile browser is similar to internet banking, browsing - based threats for smartphone are just the same as those for personal computers, elevating the need to focus on mobile security among the several authentication schemes,geolocation authentication is gaiming importance as it is found most suitable for mobile devices. In this paper geomob, a dedicated secure mobile browser for mobile banking that makes use of multifactor authentication is designed and developed geomob features a geolocation based authentication scheme which ensures security of mobile transactions based on the user location.

in addition to the existing two factor authentication scheme using user id ,password and otp, the mobile number and geolocation is used to authenticate the user, the geolocation intimates the banks location from where the transaction is going to be performed thus helping banks to ensure secure transaction ,the geolocation of the user is acquired through the network provider and hence the need for using GSM is eliminated,the multifactor authentication used in geomob ensures security while performing mobile transaction and prevents users from various attacks.

## Keywords

Geomob, Geolocation,GSM

# Future Prospects of Big Data and Machine Learning in Healthcare

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## Abstract

Big data is extensive in size and thus contains massive information, and used in many fields. So, it's a hot topic of research, got special attention from researchers for a long time. Nowadays, many public and private sector industries are dependent on this, as they store and analyze the data generated in their domain, to improve their services. One of the prominent sectors of the usage of Big Data is in the healthcare industry. They have various source of data such as patient medical records, disease history, hospital records, and disease symptoms. Research on Biomedical also produces a large share of the data relevant to public healthcare. The challenging task is the proper management and analysis of the generated data to derive meaningful information. Big data in healthcare refers to the patient, consumer, and clinical data which is vast and multidimensional, severe to analyze by traditional method. So, in the medical field, it is the job of a data scientist to process such data using machine learning algorithms.

The large amount of information that is processed computerized in the medical field makes it an ideal area for the use of techniques known as Big Data Analysis (BDA) and Machine Learning (ML), which allows improving the future. Big Data and Machine Learning aim to enhance the clinical research capacity and to direct more precisely the therapies given to patients. BDA is the integration of multidimensional data, its quality control, analysis, interpretation and validation. Its application provides comprehensive knowledge discovery from a vast data set. Generally, BDA in healthcare helps in analyzing extensive data set of thousands of patient, identifying different clusters, the correlation among them. It also helps in developing models for disease prediction using various data mining techniques. It also integrates analysis of fields of bioinformatics, medical informatics, sensor informatics, health informatics and medical imaging. After the big data analytics, the knowledge discovered should benefit to clinicians, patients and policymakers of health sectors

## Keywords

Big Data, Machine Learning, Healthcare, Data Mining, BDA

# Design and Fabrication of Aurdino Controlled Multioperational Agriculture Machine

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## Abstract

The main aim of agricultural robotics is apply robotics technologies on the field of agriculture as well as the agricultural challenges to develop new techniques. Now days, no one can end up the day devoid of using any kind of embedded system goods. Design development and fabrication of machine which comprises of digger to put the soil seeds sewer to put the seeds, leveler to close the muds and sprayer to spray the water, this whole system works on automation with the help of battery. Agriculture is primary occupation chosen by about 40% of World population. In recent year the development of automatic vehicle in the agriculture has experience increase interest the vehicle is controlled by Aurdino and relay with the help off Wi-Fi technology. The idea of applying automation technology in agricultural field is very new. In agriculture, the chances for machine enhanced productivity are immense and the machine is appearing on farms in various guises and in increasing numbers. We can expect the machine performing agricultural operations autonomously such as digging, seed sowing, mud closing and water spraying.

## Keywords

Arduino UNO, Relay, Motor, seed sprayer, leveler

# Analysis of Compression Techniques on Various Components of Document Images Leading to Compressed Document Images

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## Abstract

Technological developments and recent advancements in the IT sector have led to the growth of digital data leading to huge challenges faced by the companies to store and transmit the digital data giving rise to big data. Today, excessive usage of electronic devices by every human being is giving rise to tremendous increase in the digital content. There exist various sources for generation of documents which are generally referred as document images. In literature, attempts have been made to store these document images in compressed form. Compression is dynamically applied based on the type of the data and application of suitable compression technique for the correct document gives rise to effective utilization of the storage space and bandwidth. Sources of information in digital form have paved a way to understand the epic of text documents, e-papers in the soft form known as digital documents. Digital documents are generated from various devices from a tiny smart cell phone to huge fax or digitizing machines available today. The digital form of documents from various sources raises challenging issues such as storage space, duplicate copies, forgery and retrieval of appropriate documents. Digital document storage has become a problem of importance to research community as documents lose their visual representation and are stored in binary form. Suitable to the nature of components in the digital documents various compression techniques are evaluated to achieve high compression, less memory space and easy transmission across various types of network. In this work, a detailed structural and content representation of components in the document images is discussed to understand the representation of the document in the binary form. An insight on application of appropriate compression techniques and review of various compression schemes will allow researchers to choose suitable technique for compressing a document image. Also these days, there are attempts being made to process the compressed document images by the researchers so that the decompression stage is avoided. By this, it opens up with several challenges from the perspective of applying suitable compression techniques to document images and processing the documents in its compressed form without undergoing the stage of decompression.

## Keywords

Compression, Decompression, Document Images, Digital Documents

# Dual Ceramic Reinforced Aluminium Matrix Composite: An Era of Hybrid Material

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## Abstract

From the last few decades, the researchers are working on Al based hybrid composite material. In hybrid composite material, the strength to weight ratio, the stiffness to weight ratio and toughness are superior as compared to steel and aluminium, which is beneficial in automobile sector, aerospace industry, marine transport and rail transport. Properties of Al based hybrid composite are affected due to variation of different types of reinforcement. In this study, an overview on effect of ceramic ($Al_2O_3$-C/$TiO_2$) on phase, microstructure, density, hardness, impact strength and tensile strength of Al based hybrid metal matrix composite is been reported. X-ray diffraction reports the intermediate phase formation between added dual ceramic and Al matrix. Scanning electron microscope shows that reinforcements are distributed uniformly in Al matrix. Density and hardness of the composite are increased. It is observed that mechanical properties of the composite improved with a variation of dual reinforcements in Al matrix. These specifications make hybrid composite popular in automobile and aerospace industry. Hybrid composite is a better replacement of conventional materials.

## Keywords

Hybrid Metal Matrix Composite, Stir Casting, XRD, SEM, Mechanical Behavior

# Compressed Document Image Analysis and its Applications

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## Abstract

Recent development in the IT industry has led to the growth of digital data in the fields like medical, government offices, education sector, banks, social media, Digital library and so on. Advancement in the recent technologies has paved their way in converting the traditional offices into paperless offices. Also, the growth of digital libraries, e-governance, and internet based applications has led to the increased volume of the digital data which mainly includes texts, graphs, images, audio and video as various components in the document giving rise to the complex document images which are used for archival and transmission on regular basis. Every human being in the planet today generates digital data in some form or the other. Also the world's pride in the field of cultural, artistic and scientific production is currently available in the form of paper documents which are now getting converted into e-documents generally called as Digital documents or Document images. These document images undergo analysis to understand and retrieve the relevant information. But, as the document images generally consume more space and time for storage and transmission they are being compressed and stored in its compressed form which can be called as Compressed Document Images. Conventional method of performing analysis on these document images included decompression for bringing the data representation back to its original form followed by processing and then re-compression to make efficient storage. But now, researchers are focusing on to processing the document images in its compressed form known as Compressed Domain Processing. Hence, it's essential to automate the process of document image analysis which will assist human in several applications without performing decompression and achieve good storage and transmission efficacy. This paper discusses on processing document images in its compressed form.

## Keywords

Compression, Compressed Documents, Document Image Analysis, Digital Data

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# Friction Stir Welding of Dissimilar Aluminium Alloys and Its Characterization

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## Abstract

Friction Stir Welding (FSW) is one of the remarkable process that is gaining significance due to its ability to deliver solid joints. The method is adequately utilized in this research to join 5 mm thick divergent aluminum alloys of AA 7075 and AA 5052. The impact of tool pin profile and rotational speed on the mechanical properties like micro hardness and tensile strength are accomplished by the streamlined Design of Experiments (DOE). The weld joints are acquired by utilizing four distinctive tool profiles viz., straight cylinder, taper cylinder, square and straight triangular at a speed of 800, 1000, 1200 and 1400 rpm and a feed rate of 100 mm/min, 120 mm/min, 140 mm/min and 160 mm/min. The investigations are structured dependent on L16 Orthogonal Array (OA) considering taguchi strategies. The results of test procedures are organized and taguchi techniques, Analysis of Variance (ANOVA) are completed in Minitab programming. From the test results and factual procedures, the technique is approved and the results of the investigations are seen as in close concurrence with the statistical outcomes with the error less than 5% of the mean. The streamlined procedure parameters for better micro-hardness are as follows: tool rotational speed of 1200 rpm, feed of 120 mm/min, tool offset of 1 mm, and tapered cylindrical pin profile; while the procedure parameters for better tensile strength are as follows: tool rotational speed of 1400 rpm, feed of 120 mm/min, tool offset of 1 mm and tapered cylindrical pin profile. The design and optimization of the procedure parameters for friction stir welding of different aluminum combinations is essential for high quality weld joints.

## Keywords

Friction, Stir, Welding, Dissimilar, Aluminium, Alloys, Characterization.

# 3-D Magnetohydrodynamic AA7072-AA7075/Methanol Hybrid Nanofluid Flow above an Uneven Thickness Surface with Slip Effect

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## Abstract

In this paper, we studied the 3D free convection flow of electrically conducting hybrid nanofluid past a slandering surface of non-uniform thickness in the presence of slip effects. We pondered aluminum alloys of AA7072 and AA7072+AA7075 in methanol liquid. The aluminum alloys amalgamated in this study are uniquely manufactured materials, possessing enhanced heat transfer features, AA7072 encompassed with 98% Aluminum and 1% of Zinc with the additives such as Si, Fe and Cu. Similarly, AA7075 comprises 90% Aluminum, 5–6% Zinc, 2–3% Magnesium, 1–2% Copper with the additives such as Si, Fe and Mn. In this study, R-K and Newton's methods are employed to obtain the numerical results. Impact of physical parameters on the distributions of temperature, microrotation and velocity are analyzed with the aid of plots. Results ascertain that, heat transfer rate in methanol based AA7072+AA7075 nanofluid is significantly high as compared with methanol based AA7072 nanofluid.And also, the wall thickness parameter has a tendency to improve heat transfer rate of both the nanofluids.

## Keywords

Slandering sheet, hybrid nanofluid, MHD, slip effects, Aluminum alloys nanoparticles

# Fabrication and Characterization of Hybrid Aluminium AA 5083/SICP/Fly Ash Composites

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## Abstract

The present research focuses on the development of Aluminium AA 5083/SiCp/Fly ash composites. The objective of the present research is to manufacture hybrid high performance Aluminum-SiCp-Flyash metal matrix composites and assess the characteristics, so as to obtain a distinct class of the composites; a remarkable strategy for preparing this distinctive composite relies on the optimization of the infiltration assisted stir casting technique by varying the Weight % of reinforcements viz., Silicon Carbide (SiCp) in the range of 3 to 7 wt.% in the intervals of 2 wt.% and Fly Ash (FA) constant at 2 wt.% to 5 wt.% in the intervals of 1 wt.%. Amid the exploration, a requirement for an improved attribute is identified, therefore a lot of far-reaching testing techniques are considered to evaluate the properties for composite specimens; the outcomes of these explorations are presented in this paper, which focuses on the work carried out to enhance the properties of the aluminium alloy by reinforcing it with the reinforcements and thus comprises of the findings of mechanical, and microstructural properties; it is unmistakably obvious from the discoveries that there is huge improvement in the properties viz., tensile strength by 29.64%, compression strength by 19.17%, hardness by 33.2%, and impact strength by 29.04%, because of the controlled dispersion of the reinforcements in the matrix. Further, the translations are drawn for every one of the properties and the reason for improvement in the properties is inferred which will eventually give a learning base for improvement in the new composite framework for cutting edge engineering applications requiring better qualities and execution record.

## Keywords

Aluminium, Fly ash, Silicon carbide, Fabrication, Characterization.

# Is Integration of Blockchain With IoT Really Solve Security and Privacy Issues of IoT?

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## Abstract

An unprecedented advancement of wireless technology, processing speed, 5G, big data, machine learning, cloud computing, and IoT, have changed the way of processing, storing and sharing of data. According to market research and survey agencies, by the end of 2020 around 50 billion connected devices with an approximate 6.58 accessories will attach to per person. IoT offered a cutting-edge opportunity in automation and traffic management, but it comes with certain limitations that cannot be ignored. IoT offers an all-inclusive model for information sharing to the upgrading society by empowering propelled benefits by interconnecting things dependent on existing wireless communication technologies. The extraordinary increment in information due to IoT, raise security, protection, trust, and validation issues in industry 4.0. Ensuring the privacy and security issues for massive incoming data from IoT in the coming years is a challenging issue for researchers and scientists. Nowadays, blockchain technology has gone far beyond its beginning in cryptocurrencies and banking. Blockchain has decentralizations, persistence, anonymity, immutability, identity and access management, resiliency, autonomy, apriority, cost-saving as attractive features. Since we update blockchain ledger regularly, and regular updating may lead to the problem of centralization. Due to storing all the transaction information and the exponential increase of storage, limited IoT devices leads to a drastic increase in the size of the blockchain. It is the primary drawback of integration with IoT. Some of the blockchain implementations have the processing of very few transactions per second. However, some real-time IoT applications need very high processing transactions per second. It may also be a significant bottleneck of integrating IoT with blockchain. The integration of IoT with blockchain will raise few questions for industries like how the industry will enable peer to peer communication between globally distributed devices, how the industry will provide compliance and governance for autonomous systems and how the industry will address the security complexities of IoT landscape. The integration of blockchain with limited resource IoT devices is not suitable due to the lack of computational resources, limited bandwidth and they need to preserve power. To resolve the issues of scalability of storage size, researchers are proposing a new optimized storage blockchain using the concept of removing old transaction records from the blockchain.

## Keywords

# Impact of the Social Networking Sites on Mental Health

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## Abstract

The use of Social Network Sites (SNS), particularly by the younger generations, is growing nowadays. SNS availability allows users to share their daily routine, express their interests, feelings and share. Many researchers demonstrate that correct use of user-generated content (UGC) can help to determine the mental health levels of people. UGC mining could help to predict and deprecate mental health rates , UGC mining could help to forecast Levels of mental health and depression; Depression is a dangerous one A medical condition that often interferes with the ability to work; Research, eat , sleep, and just have fun. From the user profile though In SNS, we may collect all the details pertaining to the individual Mood, and that of negativism. Our goal in this research is to investigate how postings from SNS users can help classify users according to mental health levels. We are proposing a framework that uses SNS as a data source and screening method to identify the user on SNS using artificial intelligence according to the UGC. We created a model that uses two different classificators to classify the UGC: Support Vector Machine (SVM), and Naïve Bayes. Sometimes the superstition also developed among the user who uses social media sites for regular basis whatever they told is happen eveytime so superstition is increases.

## Keywords

# 3D Printing: An Emerging Technology

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## Abstract

3D Printer is a machine which is form of additive manufacturing. It prints the object in three dimensions. First we design the required object in any one of CAD software then we save and transfer the 3D CAD model in the 3D Printer using memory card or directly and further part/component printed by the above system without the need of any part specific tooling & human intervention. There are different types of 3D printers or Additive Manufacturing System such as Selective Laser Melting (SLM), Stereolithography (SLA), Fused Deposition Modelling (FDM), Selective Laser Sintering (SLS), Digital Light Processing (DLP) etc. 3D Printer is used in industries, space technology, medical sectors, historic preservation, architectural engineering, constructions, automotive, accessories etc. In the epidemic of COVID-19, the 3D Printing technology emerged as boon for humans. Researchers made adapters which solved the problem of shortage of ventilator. Also the masks, face shield, medical equipment are fabricated with the help of 3D Printer system. In space, the scientists of NASA have also used 3D Printer to print the object. It has almost vast application everywhere. There is large scope of 3D printing technology in future. In future we will be able to develop a printer which will based on Artificial Intelligence (AI) so, it will save our time to print the 3D object and also reduce our work to design the object in CAD software. Presently, we are using different materials which can be used for 3D printing, such as ABS plastic, PLA, polyamide (nylon), glass filled polyamide, silver, titanium, steel, wax, photo-polymers, polycarbonate etc. If we will develop a material which can change its property according to the situation around it and can handle the effects of pressure, temperature, moisture etc. on it even in adverse situation, it will be a miracle in the manufacturing science. Now-days, we are combining the reverse engineering concepts with the additive manufacturing technology

for the fabrication of the object. This combined effect gives allot of benefits during fabrication of complicated product for defense sector, aerospace, etc. In present we have limit the size to print the object in 3D and also faces availability of material but in future these problem gets resolve and then new era of manufacturing have been started. The 3D Printing technology also saves our money and also reduces the material wastage problem. The speed of computation of dimensions of the object will also enhance. In future, the 4D Printing technology will be developed after merging the 3D Printing technology with the material technology and that will emerge as revolution in the technology.

## Keywords

# Design and Experimental Setup of Air Circulation using Duct system in a Non-AC Bus Coach

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## Abstract

Passengers travelling long distances in Non-AC bus coaches have the problem of not getting enough air causing discomfort and suffocation, research shows that people sitting next to windows receive maximum air circulation while people standing in the aisle are getting minimal air circulation and when temperatures are high mid-day it causes physical discomfort and health issues to many passengers. We know that buses across India people will always overcrowd the buses and not just limit passengers to amount of seats available, this inspires us to come up with a project to increase air flow and more importantly uniform air flow in non AC buses to increase passenger comfort using a proper duct system designed on the basis of ISHRAE standards. Numerical analysis is carried for the duct system using solidworks software for the modeling, Meshing and Analysis is carried out using Hymermesh and ANSYS Fluent software, Experimental investigation is carried out for the duct, the results obtained from Experimental and Numerical are closely matching. And not have the negative effect on the environment like conventional AC does.

## Keywords

# Cloud Computing Security: A perception of audit, quantifiable and quantitative security evaluation mechanism

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## Abstract

Cloud computing is a promising and rising advancement for the cutting-edge time of IT applications. The impediment and deterrents toward the speedy improvement of cloud computing are information security and assurance issues. Diminishing information accumulating and getting ready expense is a mandatory essential of any affiliation, while assessment of data and information is constantly the most basic endeavour's in all of the relationship for fundamental authority. On the data component of unique security of cloud computing, from a viewpoint, faith management beneath cloud computing conducts are broke down through significance; then again, DS proof hypothesis under data update procedure is effectively presented. A composing study of the work in the zone of cloud computing information security is coordinated and the review is presented, the strategy of cloud computing security evaluation is researched quantitatively. The computable security assessment implies for single cloud or multi-cloud condition. By building up an assessment mechanism of cloud computing security dependent on faith of the executives, then not just adequately lessens utilization with respect to evaluation of the cloud computing security, yet in addition improves the measurement level of cloud computing security appraisal.

## Keywords

Cloud Computing, Trust Management, Data Security, Cloud Security, Quantifiable Evaluation, Security Visualization

# Low Cost Ultraviolet-C Disinfecting Device for Prevention of Healthcare-Associated Pathogens in Public Places

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## Abstract

The mortality rate due to the pandemic Covid-19 is very high. Mass sanitization is one of the most efficient methods of preventing the spread of harmful pathogens. Many hospitals are shut down due to the spread of viruses. If this situation continues then it would be impossible to accommodate the increasing number of patients. Sanitization using the existing methods is not efficient in these areas, as they do not give quick results and the existing system requires human force which is not practical since it puts the person at health risks. Furthermore, after lock-down, more people will use the public transportation systems; therefore, implementation of economical and mass sanitization procedures is critical. The primary solution to this problem is mass sanitization. The existing methods include spraying alcohol-based solutions that may leave harmful pathogens active as some viruses can stick to the surface for a long time and many are drug-resistant. The existing ultra violet-D (UVD) Robots cost about $80,000 that cannot be afforded by countries that have low GDP. Non-Contact sanitization is much more efficient and low risk. In view of this, the aim of the current work is to build a mobile-app controlled low-cost disinfection robot that uses UVC which is clinically proven to kill 99.99% pathogens. The design has two parts; hardware part and software part. The hardware part comprises four 3 feet Philips G30T8 TUV lamps, four UV dichroic reflectors for maximum intensity, LNSLNM 500W power supply, HD 1200TVL CMOS FPV cameras that help to view the entire area for disinfection and electric ballast. It is mounted on a stainless steel framework. The base part is equipped with four caster wheels that provide free rotation and two powered wheels on the center on both sides. The wheels are powered using 12V DC 130rpm gear motors. The electronic components consist of an ESP8266 module that is connected to the Cytron 13A, 5-30V motor driver. The software part includes the ESP module and a mobile app to control the robot. From an economical viewpoint, our robot is a one-time investment, unlike the present disinfection system, and requires very little maintenance. Moreover, it does not put health professionals at risk during disinfection procedures, since the whole process is controlled remotely. Most of the parts used are readily available and can be procured en masse to cut down the cost further. Since it is autonomous it can be used anywhere such as hospitals, malls, buses, airplanes, trains, etc, and can disinfect the whole area within 20 minutes. Additionally, it can even penetrate areas that are typically not accessible, with careful placement. In this way, we can prevent the spread of pathogens. Since the Robots have a very long lifetime, their use can be extended even after the pandemic and their potential is limitless.

## Keywords

Covid-19, sanitization, ultra violet-C, electric ballast, ESP module

# Exploring Social Network Analysis towards Online Criminal Community Detection

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## Abstract

The accessibility of innovation and the fast development of the web have brought us closer through social platforms. Persons with common interests, desires and tastes tend to become aligned in social networks, resulting in group or virtual cluster conformation. The ability to identify user sets that interacts more often enables us to understand how impact, knowledge, perception and even happiness flows through a social network. Identification of these sets or groups is known as community detection. Social networking is one methodology towards understanding criminal networks since it very well may be utilized to distinguish core persons and their relationships. Given the severe heterogeneity of individuals and groups engaged in criminal activity, it may be important to examine and analyze their characteristics to gain significant data and improve awareness about their behaviour. The current work will try to accomplish this objective through social network analysis approach.

## Keywords

Social Network Analysis, criminal networks, virtual cluster

# Applicability of 3-D Printing Process in Footwear Industry

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## Abstracts

3-D printing (3-DP), also known as additive manufacturing has modified the manner by which product can be designed and created. Through this technique, 3-D items can be designed using various software and then created layer by layer. Uses of 3-DP can be found in pretty much every sphere of human needs, for example medical, aviation, automobile, food technology, fashion designing, footwear industry, jewelry designing etc. In this work, an overview of 3-D printing and its applicability in footwear industry are discussed. This modern technology permits creative and innovative designing and printing of footwear. Research work pertaining to applications of 3-DP in footwear manufacturing were gathered, examined and summed up to give inside and out data here.

## Keywords

Additive manufacturing 3-D printing, printing layers, footwear industry

# Glance at Automobile Safety Systems

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## Abstract

Automobiles have limited distances. In ripple of an eye miles can be covered. They have made another insurgency in the history of mankind. They are the most well established mode of transportation. There are various designs of automobiles available for different purposes. Owing an automobile has become a kind of status symbol and its number is colossally on the ascent. Be that as it may, with the increase in number of vehicles, the chances of road mishaps are also increasing tremendously. In this way, serious consideration is required to be paid to reduce the rate and severity of accident. Safety is not just a thing but it is everything. Thus, the best safety measure must be given top priority while settling on a choice to acquisition of an automobile. The idea of optional safety is related with the avoidance of mishaps or limiting its harmful effect. There are numerous safety systems that secure the travelers in the event of an accident. In this paper, some of the important automobile safety systems are discussed. Such systems can be grouped in two category- accident protection and accident avoidance systems. It is desirable that vehicle should be selected that should provide trouble free running with maximum safety features.

## Keywords

Automobile, road accidents, safety systems, seat belt, air bag.

# Mechanical characterization of epoxy resin on oil palm fiber reinforced chicken-egg-shell-powder based bio-composite

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## Abstract

Developing sound condition mindfulness around the world has raised the significance of characteristic fiber fortified composites (NFRC) in the field of research. This examination work presents novel oil palm fiber/chicken egg shell (OPF/CES) bio-composite is made through utilizing powder preparing method impacted by araldite epoxy pitch with hardener. In this oil palm fiber, chicken egg shell powder, epoxy pitch is incorporated for the improvement of composite material. Oil palm fiber (OPF) separated from the unfilled organic product packs is demonstrated as a decent crude material for bio-composites. The cellulose substance of OPF is in the scope of 43%–65% and lignin content is in the scope of 13%–25%. A gathering of the morphology, substance constituents and properties of OPF as detailed by different scientists are gathered and introduced in this paper. The Bio composite is made by the assistance of egg shell powder handling strategy impact by the epoxy sap. Egg shell is changed over into powder structure for the planning of composite. Oil palm fiber goes about as the type of strengthening material and oil palm fiber is one of the most widely utilized regular fiber. In this paper we are making three kinds of tests by fluctuating the rate measure of oil palm fiber and chicken egg shell powder. First sample contain 3% OPF/97%CES, second sample contain 5%OPF/95%CES and third sample contain 7%OPF/93%CES for the creation of composite. After that we have studied the mechanical property of the fabricated composite material. Accordingly, mechanical tensile strength was estimated by utilizing universal testing machine. The outcome demonstrated that the composite fortified with oil palm fiber has give better mechanical property. Oil palm fiber based composite is a potential resource material for various planning applications in the electrical business, vehicles, railways, building materials, geo-materials, safe-monitor and in the packaging industry. Oil palm fiber has high reinforcement quality in compare to sisal fiber. So if use this types of fiber for reinforcing then mechanical property improved in respect to sisal fiber mechanical property.

## Keywords

Oil palm fiber, chicken egg shell, reinforcement, mechanical property, Bio-composite

# Mechanical Characterization of Epoxy Resin on Sisal Fiber Reinforced Chicken-Egg-Shell-Powder Bio-Composite

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## Abstract

Growing healthy environment awareness around the globe has raised the importance of natural fiber reinforced composites (NFRC) in the field of research. This research work presents novel sisal fibre/ chicken egg shell (SF/CES) bio-composite is made through using powder processing technique influenced by araldite epoxy resin with hardener. In this sisal fiber, chicken egg shell powder, epoxy resin is included for the development of composite material. Bio composite is made by the help of egg shell powder processing method influence by the epoxy resin. Egg shell is converted into powder form for the preparation of composite. Sisal fiber act as the form of reinforcing material and sisal fiber is one of the most used natural fiber. In this paper we are making three types of samples by varying the percentage amount of sisal fibre and chicken egg shell powder. First sample contain 4% SF/96%CES, second sample contain 6%SF/94%CES and third sample contain 8%SF/92%CES for the fabrication of composite. After that we have to calculate the mechanical property of the fabricated of composite material. Thus, mechanical tensile strength was measured by using universal tensile testing machine. Successful fusion of epoxy resin as a reaper binder support user interface between the chicken-egg-shell-powder and sisal fiber as achieved. The result has clearly shown the epoxy resin composite reinforced with sisal fiber has a better mechanical property. Sisal fiber based composite is a potential asset material for different designing applications in the electrical business, vehicles, railroads, building materials, geo-textiles, safe-guard and in the bundling business.

## Keywords

Chicken egg shell, Natural fiber reinforced composites, Sisal fibre

# Effect of Reinforcement of Carbon Nano Tubes in Composite Plate and Its Behaviour -A Review

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## Abstract

A study of carbon nano tubes and their synthesis as well as growth. And various properties of carbon nano tube such as physical, optical, electrical transport, vibrational, thermal and mechanical properties. Understanding the developement of effective material properties of composites when carbon nano tubes are been used. Study of elastic moduli of carbon nano tube composites investigating the elastic moduli using molecular dynamics (MD) and energy minimization methods. Studying the use micromechanics relations of the behavior of nanocomposite beams with reference to deflection and stresses. Investigation of the mechanical characteristics of the CNTRC plates using the numerical examples. Bending and free vibration analyses are presented. Micromechanical model and multi-scale approach is studied for understanding the effects of temperature change. Investigation of the functionally graded carbon nano tube reinforced composite plates under Post buckling behaviour. It is observed that thermal load ratio and the transverse volume fraction have an effect on the Postbuckling tendency of CNTRC plates. Cross-ply laminated composite plates show the accurate natural frequency and buckling stress results under the studies of global higher order theories. Various conditionings of the boundary are taken into account for the study of the buckling model shapes. And considering the hole present in plate bucklin model shapes are derived. When two edges and four edges are clamped hole size strongly affects the critical buckling temperature but critical buckling temperature is not appreciably affected when the four edges simply supported.

## Keywords

Carbon nano tube, Nano composite, CNTRC, Thermal buckling, Static analysis

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# Constructing "Synthetically Smart Urban areas" Protect Humankind from Cataclysmic events, Pandemics, and Different Calamities

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## Abstract

Lately, man-made consciousness (computer based intelligence) has begun to show itself at a remarkable pace. With exceptionally advanced abilities, man-made intelligence can possibly drastically change our urban communities and social orders. In spite of its developing significance, the urban and social ramifications of simulated intelligence are as yet an understudied zone. So as to add to the continuous exercise to entice this exploration hole, here we presents the idea of a misleadingly shrewd city as the possible replacement of the famous keen city brand—where the astuteness of a city has come to be firmly connected with the utilization of feasible mechanical arrangements, including computer based intelligence. The investigation investigates in the case of building misleadingly insightful urban areas can protect mankind from cataclysmic events, pandemics, and different fiascoes. The entirety of the announcements in this perspective depend on an intensive survey of the ebb and flow status of computer based intelligence writing, research, advancements, patterns, and applications. This paper creates bits of knowledge and distinguishes planned examination inquiries by diagramming the development of simulated intelligence and the expected effects of the methodical reception of computer based intelligence in urban areas and social orders. The created experiences illuminate urban policymakers, directors, and organizers on the most proficient method to guarantee the right take-up of computer based intelligence in our urban communities, and the distinguished basic inquiries propoundment researchers' bearings for planned innovative work.

## Keywords

Man-made consciousness (computer based intelligence), falsely savvy city, misleadingly knowledge lodge, brilliant city, shrewd urban innovation, urban informatics, reasonable urban turn of events, environmental change, pandemics, cataclysmic events

# Study the Effect of Nanofluid on Machining and Machining characteristics: A Review

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## Abstract

When the particles of metal or non-metal of range 10^-9m are mixed with base fluid like water or conventional base fluid like mineral oil or in vegetable oil are known as Nanofluid. During conventional machining dry method used where no coolant/lubricant used hence increased in temperature cause distortion of machine. Therefore, various machining like drilling, milling, grinding, and turning used various minerals/vegetable oils which only act as lubricant and also cause adverse effect on environment and health of workers so small size (macro or micro particles of metal or non-metal) are used into the oils for increasing thermal conductivity but problem of clogging takes place. This review discussed the use of nano-sized particles in oils for the property enhancement like thermal conductivity, good surface finish, good lubricating property and rheological properties improvement of the machined surface. Furthermore, nanoparticles in basefluid together reduces the tool wear, thrust force, surface roughness, power consumption, cutting temperature and coefficient of friction. This paper also briefly discussed the MQL (coolant is blended in with packed air or wet fog and ideal splashing is done over tool and work piece interface) and MQL-nanofluid approaches in machining processes. The summary and conclusions are also presented on basis of data collected and some area for future research is also identified.

## Keywords

Nanofluid, MQL, Surface Roughness, Thermal Conductivity, Tool Wear, Coolant and Lubricant, Drilling, Milling

# A Novel Animal Detection for Human Safety

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## Abstract

Data shows that concerning one person has been killed on the average each day for the past 3 years by roaming tigers or rampaging elephants. Statistics by India's atmosphere Ministry, 144 individuals were killed between April 2014 and 2017.That figure breaks all the way down to 426 human deaths 2014 2015 and 446 the subsequent year. The ministry free solely a partial count for 2016 17 with 259 individuals killed by elephants up to February of this year and 27 killed by tigers through May. There are many incidences like on a weekly holidays of September 2016 Leopard enters Vibgyor School at Marathahalli. During the nearly 10-hour–long drama, two people were injured before leopard was tranquilized on the school premises. The concept of our project is to help human beings from such incidences, to save human beings and to alert them from animals. If they can know or if somehow they can get the alert that there is an animal around their premise they can go in a safe place or simply they can secure themselves. This project will be a guide to humans for saving the life of their families. This will provide service 24/7 for saving people from losing their lives. Our device will be placed around the premise. Passive Infrared (PIR) sensors will detect whether there is an object around the premise. Through Edge Detection algorithm in Image Processing we will differentiate the animal and human, if it detects the presence of any animal through Globle System for Mobile communication (GSM) Module an Short Message Service (SMS) will sent to the owner so that they can secure themselves.

Internet of things conceptualizes the thought of remotely connecting and observance universe objects things through the web once it involves our life this idea is incorporated to create it smarter safer and automatic. : The main aim of our project is to alert the people to be safe from harmful animals (protect the human beings from animal as well as inform the owner and warn them so that they can secure their premises). Animal detection system is designed to detect the presence of animal near our premises and offer a warning. Passive Infrared (PIR) sensors will be placed around the premise which will detect the motion.

## Keywords

GSM, Internet of Things, PIR sensor

# Development of Light Weight Unmanned Aerial Systems (UAS) For Applications in Construction Management

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## Abstract

The construction sector is one of the world's oldest industries. At present construction industry uses several modern methods combined with traditional methods. A variety of technologies, such as radio-frequency identification (RFID), wireless sensors, and global positioning systems (GPS) have been proposed by many researchers to enhance safety performance and reduce the risk of human error at construction worksites. The Unmanned Aerial System (UAS) is an emerging technology that has the potential to facilitate construction in many aspects. UAS or drones have many advantages such as; ability to move faster than humans, reach places where work sites are inaccessible and can be equipped with wireless sensors, video cameras, radar, or communication hardware for the real-time monitoring of construction worksites. This paper aims to investigate the design and development of a light-weight drone for controlling different construction activities and also analyze their benefits and explore their potential in the construction industry. The existing drone was modified by providing accessories like sensors, cameras, GPS modules, 3DR radio telemetry kit, Air and Ground Data Transmit Module, etc. and can be controlled manually or autonomously by onboard computers. The frame of the drone is made of carbon fibers, which has many advantages over metal frames including high stiffness, high tensile strength, high chemical resistance, high-temperature tolerance, low thermal expansion, and less weight. Three on-board 120-degree wide-angle cameras were used and it provides the drone a 360-degree field of view for its safe navigation. Pixhawk P X 4 2. 4. 8 is used as the on-board flight controller and this onboard system can be programmed to follow a specific flight path as required by our needs or even can be controlled manually. The flight path is programmed using a Smartphone application. The drone is powered by a 2400KV BLDC motor and GenX 22.2V 6S 22000mAh 25 Lipo battery with AS150 connector. The drone has a custom-built charging station with a wireless charging feature. When the drone is running out of power it autonomously flies back to the charging station to charge. The hardware components of the drone were assembled, the software was integrated and programmed accordingly and performance evaluation was conducted. The results reveal that the proposed system is cost-effective, light in weight, and can efficiently monitor work safety. Thus it can be expected that the utility of drones in the future of the construction industry will continue to increase. This study will be beneficial for construction managers to raise awareness of the use of these emerging technologies.

## Keywords

Unmanned Aerial System, construction management, Radio Telemetry Kit, drone

# Cluster Based Routing Protocols of Heterogeneous Wireless Sensor Networks - A Survey

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## Abstract

Due to the advancement in wireless technology and electronics, Internet of things (IoT) has become one of the emerging research areas. The backbone for IoT is the Wireless Sensor Network (WSN). WSNs consists of sensor nodes which are responsible for sensing the information, processing the information, collecting the data from its neighbours, aggregating it and transmitting the aggregated data to the Base Station. Communication between the sensor nodes are managed by routing protocols. Routing protocols are designed for efficient utilization of energy which results in optimal resource utilization. One of the issues in routing is heterogeneous nature of sensor nodes. Heterogeneity in sensor nodes will result in different energy consumption. The protocols in Heterogeneous wireless sensor networks play a vital role in balancing the energy of the network and to obtain longer stability. So, routing protocols designed for Heterogeneous wireless sensor networks should improve network lifetime, throughput and stability. This paper presents a survey on routing protocols designed for Heterogeneous wireless sensor networks (HWSNs).

## Keywords

Heterogeneous wireless sensor networks, Heterhogeneity, optimal resource utilization, energy efficiency, network lifetime.

# PCA and K-means Clustering Based Collaborative Movie Recommendation System

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## Abstract

Recommender systems are filtering tools to predict the ratings for items and users, to recommend likes mainly from the big data. Our proposed recommendation system gives a mechanism to users to classify with the same interest. This recommender system becomes core to recommend the e-commerce and various websites applications based on similar likes. This central idea of our work is to develop movie recommender system with the help of clustering using K-means clustering technique and data pre-processing using Principal Component Analysis (PCA). In this work, a new recommender system has been proposed using K-means clustering, PCA and sampling with the help of Movielens dataset. Our proposed method and its subsequent results have been discussed and comparison with other state-of-the-art using evaluation metrics like standard deviation (SD), root mean square error (RMSE), mean absolute error(MAE), t-value, Dunn Matrix, average similarity and computational time has been also explained and prove that our proposed method is superior from other existing methods. The results achieve from the Movielens dataset is able to prove high efficiency and accuracy of our proposed work. Our proposed method is able to achieve the MAE of .67, which is better than the existing methods.

## Keywords

Principal Component Analysis, K-means clustering, Movie lens dataset

# Cloud Computing Security in terms of Stakeholders for Mobile Enterprise and Cloud Applications

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## Abstract

The instructional exercise will start with a clarification of the ideas driving cloud computing frameworks, cloud programming engineering, the requirement for mobile cloud computing as a piece of the application business to oversee new mobile application arrangement. At that point, one of a kind way to deal with characterize the security scope for the various partners of a cloud computing model. I widely analysed the different cloud stakeholders, decided their methods of associating with the cloud and explored the security gives that can concern them dependent on their inclination of communication with a cloud computing model. My proposed scientific categorization gives them an extensive rundown of security and protection properties that are related with their issues. The new security engineering offers included adaptability for the present needs. The security border that has been evaporating with the numerous cell phones, the need to associate with accomplices, and so forth is in effect legitimately re-established, and the new stifle "point" in the design has critical security abilities.

## Keywords

Cloud Computing, Mobile Security, cloud stakeholders, Cloud computing Security, mobile enterprise

# Shape Optimization of Chair Frame

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## Abstract

Shape optimization of chair frames are normally decided by aesthetic appeal, stability and ease of manufacturing. In this paper, optimization is done by stress analysis including all the above factors. Different frame shape widths are considered with same thickness. Best base width for maximum strength is found out as 120mm.

## Keywords

Optimization, Aesthetic appeal

# Modelling and Analysis of Injection Mould Design as per Plastic Industry Aspects

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## Abstract

Injection molding is one of the best processes in the plastic manufacturing industry. More than one-third of all plastic materials can be molded by injection molding process. And the injection mold is one of the main component of the injection molding process. This project brings to the surface study of the key principles and fundamentals of mold designing basics and proceeds along the way with a designing and simulation of a plastic product tubular connector. Now a day's injection mould design is the major part in product development. Injection mould design will cause of the increase in component cost, machining complexity. For avoiding these problems we are taking virtual software support like NX11 for modeling and for analysis Autodesk Mouldflow Advisor. The injection moulding process requires a molten polymer being injected into a cavity inside a mould, which is cooled and the part ejected. The main part of an injection moulding process are filling, cooling and ejection. The cost-efficiency of the process is dependent on the time spent in the moulding cycle. The mould design is the main parameter that affects the product. Injection moulding calculation of gate, runner, cooling channel is most important for the mould designing. It is necessary to determine number of cavities in mould during Injection mould designing according to plastic injection moulding machine specifications. There are basically three methods we are used to determine the number of cavities. The project is to design injection mould for reducing defects like warpage, sink marks, air traps in the tubular connector and to reduce the mould costing as per industry aspects. To achieve that first determination of the material is essential which is best for part and, then changes of vital parameters for the betterment of the process.Hence the analysis of the defects and their reason of occurring, in existing design has been explored. For analysing the part, Autodesk Mouldflow Advisor has been used. Once the defects and its reason of occurring are identified, with reference to that result the parameter to be changed has been selected i.e. product design ,runner system , gating system as well as whole mould has been designed as per the international standard mould base system i.e. DME standard.

## Keywords

Injection molding, Autodesk Mouldflow, DME standard

# Detection and Recognition of Hand Gesture from Video

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## Abstract

Hand gesture recognition is basic for human-PC association. The objective of this work is human hand unmistakable confirmation and sign certification. This is an enormously badly designed assignment as hands can be wavered perfectly healthy and perspective, they would de have the choice to open or shut, they can have different finger verbalizations. It is proposed a joined method for hand signal insistence subject to a quantifiable picture preparing tally. As a pre-managing estimation was applied and foundation thinking calculation. Thing attestation was performed with utilizing of Haar classifiers. The chance of utilizing signals for remote control of different contraptions with various hands position from the camera domain was appeared.

This investigation was coordinated with the purpose of utilizing the human hands as a thing to work PCs. It is required to help and use progressions especially in the field of guidance for helping educators to do presentation easily. The program is made by using a science field of PC vision, similarly as additional libraries which may be: OpenCV, NumPy, Math. In order to use this program, the mediators need to have a webcam and a projector. The webcam will be used to see the shape and the case of the mediators' hands. In addition, the program will confer signs to the PCs subject to the apparent model. The delayed consequence of this investigation is a program that can improve the indicating strategy of educating/presentation.

## Keywords

Gesture, human-PC association, pc vision, finger verbalizations, webcam, OpenCV, NumPy, Math, python

# Techno-Economic Evaluation of Introducing desalination plant in Rooppur Nuclear Power Plant

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## Abstract

With the increase of energy demand in this modern world nuclear power plant is getting population for various types of advantages. Among all of this energy production cost is minimum and zero carbon generation is most important. But nuclear power plant needs huge cost during construction, so this cost can be a burden for a small economic country like Bangladesh. But nuclear power plant can be worked as a cogeneration plant, and it will also help in reduce the total cost of plant construction. Rooppur nuclear power plant (NPP) is one of the biggest project currently on going in Bangladesh both technically and economically [1]. Technical details of Rooppur NPP can be found in [2]. For doing economic analysis of the plant this details has used as input in DEEP software. DEEP can be abbreviated as desalination economic evaluation program, which is used for cost estimation in a power plant where power and water production scheme active. It is a spread sheet based calculation tool [3]. This code allows various power generation options as example- nuclear, fossil fuel, oil etc. And with various types of desalination system i.e. MSF, MED, RO or hybrid system. Principle difficulties arise during nuclear desalination is the lack of resources and infrastructure in a country which is affected by scarcity of drinking water. Socioeconomic and environmental aspects and the public perception for the nuclear desalination projects are also important factors requiring greater information exchange. These aspects are discussed for Rooppur NPP while considering an integrated nuclear desalination system [4]. Three cases has considered here, at first case (base case) nuclear power plant with MSF desalination system, at second case (scenario 1) coal power plant with MED desalination system, at third case (scenario 2) oil power plant with MED desalination system.

## Keywords

Desalination plant, Nuclear Power Plant, DEEP, Economic Assessment, Cogeneration Process.

# Computer Based Intelligence Usance for COVID-19 Pandemic

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## Abstract

**Foundation and points:** Human services conveyance requires the help of new innovations like Man-made consciousness (simulated intelligence), Internet of Things (IoT), Enormous Data & Machine learning to battle and look forward against the new maladies. We mean to survey the job of computer based intelligence as a definitive innovation to examine, set us up for counteraction and battle with COVID-19 (Coronavirus) and different pandemics.

**Techniques:** The quick survey of the writing is done on the database of Pubmed, Scopus and Google Researcher utilizing the catchphrase of COVID-19 or Crown infection and Man-made reasoning or simulated intelligence. Gathered the most recent data with respect to simulated intelligence for COVID-19, at that point investigated the equivalent to recognize its conceivable application for this sickness.

**Outcomes** We have recognized certain huge utilizations of computer based intelligence for COVID-19 pandemic. This innovation assumes a significant job to recognize the group of cases and to anticipate where this infection will influence in future by gathering and breaking down every single past datum.

**Closure:** Human services associations are in a dire requirement for dynamic innovations to deal with this infection and help them in getting legitimate recommendations continuously to evade its spread. Man-made intelligence works in a capable manner to copy like human insight. It might likewise assume an indispensable job in comprehension and proposing the advancement of an immunization for COVID-19. This outcome driven innovation is utilized for legitimate screening, investigating, expectation and following of current patients and likely future patients. The critical usances are applied to tracks information of affirmed, recuperated and passing cases.

## Keywords

Simulated Intelligence (SI), SI Usances, COVID-19, Coronavirus, Pandemic

# Nanotechnology with the principles of Green Chemistry leads to Green Nano-Engineering for Sustainable Development & Environment

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## Abstract

With the rapid growth of human population, the resources supply is very short. So, a green technology is required in order to give the society a sustainable growth. Nanotechnology (a wide area of research in which things work on nano-scale 10^-9 m) along with principles of green chemistry (the design of *chemical* products and processes that diminish and eradicate the use and generation of toxic substances) gives Green Nano-engineering (a low cost, non-toxic and highly functional efficient nano-product development or use) which helps to alleviate the polluted air, water and land and also improve the performance of traditional pollution cleaning technology in order to minimize hazardous end products. This abstract basically discuss the various applications of green nanotechnology such as multifunctional nonmaterial for the sustainable energy generation, nano-sensors for identifying and checking the contamination, green bundling, semiconductor photo catalysis for compelling natural remediation, and a novel layer for additional proficient treatment and cleansing of wastewater. Absorbents along with nano-particle of zeolites, metal, metal-oxides, polymeric membrane, and porous nanofibers can remove pollutants like heavy metals, dyes and pesticides degradation from contaminated water. By implanting semi-conducting nano-material having large surface to volume ratio over conventional membrane, a novel photo catalytic membrane develops to give best results for water treatment and purification. Nano-photocatalyst is a technology in which nanoparticles of catalyst generate hydroxyl radicals (OH) which convert the toxicant into non-toxic end products like $CO_2$, $H_2O$, etc. and hence removal as well as mineralization of contaminants from waste leads to sustainable cleanup of environment. The major research is in nano-enables solar cells with green chemistry principles in which nano-materials such as titanium dioxide, quantum dots, cadmium telluride, silver with polymer are used in solar cells which absorbs solar energy at a large fraction and also due to their structures like nano-wires and nano tubes they can be made in spherical shape with flexible structure hence less space is required for their installation and working. The use of nanotechnology for in situ remediation just to diminish the general expenses of remediation of sullied locales yet in addition to decrease tidy up time, wipe out the requirement for removal and treatment of tainted soil, and lessen the danger of contaminant to approach zero. The applications of Green nano-engineering is not only constrained up to cleaner production and process yet in addition reusing of mechanical waste materials into nanomaterials by turning diesel residue/soot into carbon nano materials, fly ash into silica, alumina, and iron oxide nano materials. Hence the principle of green chemistry influences the life cycle of nano-products from design to disposal. Hence Green nano-technology/engineering use concept of recycle with eco-friendly material in use and also reduced overall power/energy consumption. In spite of high performance and low cost this Green nano-technology/engineering has some adverse effect on surrounding and human health so, researchers have to look in order to soothe this adverse impact in future.

## Keywords

Nano-Technology, Green nano-engineering, green chemistry

# An overview on Metal printing

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## Abstract

This paper reviews the rapidly emerging manufacturing technology that is also called additive manufacturing (AM), direct digital manufacturing, 3D printing, freeform fabrication etc.This paper provides a broad overview on additive manufacturing/ metal printing technologies.AM is capable of producing complex shapes using metals, polymers, ceramics and composites also of reducing waste, lead time and costs.

## Keywords

Powder bed fusion (PBF), Binder jetting (BJ), direct energy deposition (DED)

# Analysis of Industry 4.0 and Improved Lean Manufacturing

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## Abstract

The current worldwide manufacturing industry is quick changing with developing overall interest for better, increasingly creative, esteem included and fulfilling items. In this manner, industrial and manufacturing framework must adapt to the situation and satisfy the hunger of customers worldwide for the items productively. Manufacturing enterprises esteem creation must be equipped towards higher effectiveness and efficiency. Industry 4.0 starts carrying fabricating capacities to the following level, the fourth phase of the mechanical transformation. This paper review the writing accessible on the Industry 4.0 (Industrie 4.0) activity and decides to distinguish the profoundly referred to papers models. Afterward, an audit of the effect of Industry 4.0 advancements on Lean manufacturing adequacy, specifically, the disposal of various squanders was likewise introduced. It is unmistakably settled from this review and evaluation practice that there are a lot of potential for Industry 4.0 condition to additionally improve the viability of Lean Manufacturing activities to drive proficiency and efficiency better. Industry 4.0 will make it conceivable to accumulate and dissect information across machines, empowering quicker, increasingly adaptable, and progressively effective procedures to create more excellent products at diminished expenses. This thusly will expand fabricating profitability, move financial matters, encourage mechanical development, and adjust the profile of the workforce—eventually changing the intensity of organizations and locales.

## Keywords

Industry 4.0, Lean manufacturing, Mechanical transformation

# Intelligent Video Surveillance System

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## Abstract

Nowadays Closed-circuit television (CCTV) are installed at many places like banks, institute, private organization and government organization. In these system there is no intelligence to detect the malicious activity in front of video surveillance. Also the Closed-circuit television (CCTV) system does not provide alerts of burglary happening at particular time. We describe a System for Security analytics based on a combination of video understanding and transaction-log. System provides object detection (Identifying the suspicious objects, missing objects, Using Electronic gadgets/products in Exams, Students movements during Exams, security management (Identifying unknown person roaming in premises and unknown vehicles entered into premises), and Send alert (display alert on monitoring screens).Detecting the students who are using mobile phones in the classroom to maintain discipline during lectures.Detecting the students who are using lab and roaming in the corridor during the lectures. Intelligence video surveillance addresses real time observation of individuals objects and vehicles among a busy setting resulting in an outline of their actions and interactions.The technical issues include moving object detection and tracking, object classification, human motion analysis, and activity understanding, touching on many of the core topics of computer vision, pattern analysis, and artificial intelligenceThere Immediate desires for automatic surveillance systems in commercial law and military applications. mounting video cameras is reasonable however finding available human resources to look at the output is expensive.Although police investigation cameras are already rife in banks stores and parking lots video information presently is used solely "after the fact" as a forensic tool therefore losing its primary profit as an active real time medium.

In this project, System analyses the live stream video from the Closed-circuit television (CCTV) by using tensor flow Application Programming Interface(API) detect the objects. In these video from Closed-circuit television(CCTV) footage is stored into database and retrieve from database for video analysis by using Tensorflow API's and displaying it on Web page using java servlet and JavaServer Pages(JSP). According the permission of the user the access of the application should be provided. If the system detect or meet any scenario or algorithm of video analysis, Then it should throw alert.

## Keywords

Application Programming Interface, Intelligent Video

# Utilization of Waste Plastic as 3D Printer Filament for the Fabrication of Household Products

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## Abstract

Plastic waste is considered to be the most hazardous among all pollutants being disposed of into the environment. Although plastics find abundant uses, it takes a very long time to degrade, which contributes to pollution of the land. Besides, plastics, when burned, release an enormous quantity of toxic chemicals into the atmosphere such as dioxides and phosgene, thereby contributing to air pollution. The burning of plastics releases chemicals such as phosgene and dioxides that are considered a hazard to the ecosystem. The noxious detritus released from plastic wastes enter the water bodies and food chain in the form of micro plastics. The efficient and sustainable management of plastic waste is the primary concern in India at present. Recycling of plastic wastes into alternative resource materials for 3D printing shall reduce global carbon emissions to a great extent and also alleviate issues related to landfills. Taking into consideration, this paper attempts to examine the feasibility of utilizing waste plastic from urban centers as 3D printer filaments for the fabrication of household items. Polyethylene was the material used in fabrication because over 92% of urban plastic wastes exist in the form of High-Density Polyethylene (HDPE) and Low-Density Polyethylene (LDPE). The present work uses High-Density Polyethylene (HDPE) wastes which include plastic bottles, utensils, wrappers, bags, etc. as input substrate for use in the Additive Manufacturing method of Fused Deposition Modeling (FDM) to fabricate rural household items such as utensils, and other implements. The waste plastic bottles were collected and the rigid plastic components were converted into a near powder form by using an industrial grinder, following which they were drawn into thin filaments using an industrial extruder. This filament was then used as the base feed material or substrate for 3D Printer outfitted with a custom extruder. Finally, the component was printed using this setting and was tested to demonstrate real-life viability. This method would present a sustainable alternative to land filling and incineration, which are currently the most conventional forms of plastic waste disposal. Furthermore, this proposed method can be distinguished from conventional recycling in that value addition is much faster and significant as the end product is realized with no additional steps besides grinding and filament drawing.

## Keywords

3D printing, 3D printer filaments, High-Density Polyethylene, Fused Deposition Modeling

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# Seismic Analysis of High Rise Building Using Outriggers -A review

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## Abstract

Tall building development is fastly increasing worldwide and facing new challenges that need to be solved through engineering techniques. In modern tall buildings, lateral loads produced by wind or earthquake are often resisted by a system of coupled shear walls. But when the height of building is increased, the stiffness of the building structure becomes more important and to provide sufficient lateral stiffness to the structure, introduction of outrigger beams between the external columns and shear walls is often used. To identify the optimum locations of these outrigger beams under wind load, range of different strategies have been employed. However, there is lack of scientific research or case studies dealing with optimum outrigger location under earthquake loads. This study leads to identify the optimum outrigger location in tall buildings under earthquake loads. To provide a consistent level of approach a building having 50 storeys was investigated and three different peak ground accelerations to peak ground velocity ratios in each category of earthquake records were incorporated in this research study. The analysis of response spectrum was conducted and performance of the structure was obtained considering response parameters like inter storey drift and lateral displacement. From this study it has been observed that the structure is optimised when the outrigger is placed between 22-24 levels. Therefore it can be concluded that the optimum location of the building is between 0.44-0.48 times its height taken from the bottom of the building.

## Keywords

Response spectral analysis, outrigger beam, lateral loading systems

# Experimental Study of Shielded Metal Arc Welding on the Parameter of Weld Strength

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## Abstract

Welding is safe operation when carried out under normal and correct workshop conditions, but it must be pointed out that equipment free from defects and well arranged, properly ventilated, tidy workplace are important factors for safe working. Even though, welding is carried out widely across the world, when certain basic measures and precautions are not followed, it results in injuries, discomfort, loss of eye sight after a longer period, or sometimes even leading to death of the people work there. There are a large variety of welding and allied processes used in the modern industry.

In general welding processes can be divided into the two basic categories, as fusion welding and solid-state welding. These processes differ in the manner with which heat, pressure or both are applied and the equipment's used for the process. Shielded Metal Arc Welding (SMAW) and Gas Metal Arc Welding (GMAW) account for 60-70% of welding activities in most of the industries. Its' ease of operation, flexibility, and efficiency make welding a viable and attractive process in modern industries. Shielded Metal Arc Welding is one most common welding that's typically used in fabrication method in small scale industries to weld part because it's case of operation, high strength join and additionally as a result of it's lower value camper to total discharge attachment. Gas metal arc welding (GMAW) is a high-speed, economical process the weld area to shield and protect the arc, weld pool, electrode and the base metal adjacent to the weld from interacting with the atmosphere. A significant amount of fume can be generated when welding with this process.

The implementations of recommendations for reduction of fumes concentration and radiation have resulted in appreciable increase in productivity and quality of water wall panels welded.

## Keywords

Shielded Metal Arc Welding, Gas metal arc welding

# Smart Healthcare System Using Machine Learning

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## Abstract

The healthcare sector has consistently been probably the best uphold of innovation and Artificial Intelligence and Machine Learning are no exemptions. Similarly, as AI and ML penetrated quickly into the business and e-commerce areas, they likewise found various use cases in the healthcare industry. We as a whole know ML (a subset of AI) has been assuming an ideal job in the domain of medicinal services dealing with persistent information to the improvement of new treatment systems and medications, remote observing, and significantly more. The requirement for better healthcare treatments is progressively making the individuals for AI and ML enter in the realm of healthcare. As, we know there is a serious risk of viral pandemic which is threatening the whole society. The outburst of the Severe Acute Respiratory Syndrome (SARS)- COVID-19 or Coronavirus has created an incredible effect on the human society. Machine Learning has undergone various researches to fight against this pandemic and prepare ourselves for the upcoming situations. The researchers are turning their whole knowledge to develop some models which can help to contribute towards the well-being of the society. Machine learning can be deployed very effectively to predict the disease, growth, and design strategies to stop the spread. The results have shown that the machine learning is used in many applications in the healthcare industry such as vaccine identification, chatbots for covid-19, predicting the virus spread, hygiene enforcement using computer vision and thermal sensors, AI systems in hospitals. The analytics of smart healthcare system using machine learning focuses on improving the quality of one's life and as well as improving the medical conditions. The conclusion of this study is helpful in maintaining the analytics of healthcare sector.

## Keywords

(SARS)- COVID-19, Coronavirus, Machine learning (ML), Artificial Intelligence (AI).

# Effect of Wind Field Simulation Approach on the Response of a Compliant Offshore Tower

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## Abstract

The economic production of petroleum in deep water requires innovative structures which often test the limits of fixed platform design technology. The growing demand for deep water offshore platforms has thus initiated the development of economical but equally reliable alternatives in the last decade or so. As a result, there are quite a few new design concepts of offshore platforms available presently for deep water applications. One of the promising concepts is compliant offshore towers which are developed to counter the high stiffness requirements of shallow water platforms in water depths exceeding 300 m. Compliant response is achieved by controlling the mass and stiffness characteristics to de-tune the natural frequencies of vibration, relative to the frequencies of the periodic forces of wind and waves. Since they are compliant, these structures must be designed dynamically. Also, since they are exposed to loads which vary in a nonlinear way and are themselves mechanisms which behave in a nonlinear manner, their analysis is highly complex.

Articulated towers are among the compliant offshore structures that freely oscillates with wind and waves, as they are designed to have low natural frequency than that of ocean waves. This paper deals with the dynamic behavior of a double-hinged articulated tower under two different wind field simulation approaches (single-point and multi-point). The analysis includes the nonlinearities due to fluctuating buoyancy, variable added mass and instantaneous tower orientation. The nonlinear equation of motion is derived by Hamilton's principle. The equations of motion are solved in time domain by using Wilson-θ method. The root mean square (RMS) and maximum values along with salient power spectral density function (PSDF) of surge and bending moment are presented under high and moderate sea states. The results establish that the multiple-point analysis, which includes lack of correlation over the entire structure, results in response estimates lower than that of single-point formulation.

## Keywords

Multi-point wind field, dynamic analysis, compliant tower, wind induced response, offshore

# Comprehensive and Systematic Survey on Load Balancing in Cloud

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## Abstract

A million consumers are getting a seamless computing service by the system of cloud computing. The backend of cloud computing encompasses datacenter, which works as an engine for the system and makes it capable to hold an enormous amount of hardware and software. Today's working culture stipulates for dynamic system behavior and workload patterns in the cloud-computing environment. This arises the situation of load imbalance in the data center resource. The situation overloads/underloads data center resources, which show its impact in the form of resource wastage and performance degradation. With the aid of load balancing, maximum utilization of resources, and desired quality service is achieved. The workload distribution approach and optimal resource allocation in the cloud are done at runtime and schedule time to achieve load balancing. Observing its importance and relevance, a massive amount of research has been conducted to tackle the issue of load balancing. The survey is conducted to propose novel taxonomy of load balancing algorithms in the cloud. The survey also encompasses summary, brief, and comparative analysis of several affirmed load-balancing algorithms. The challenges and issues are also considered in the survey with their possible solution.

## Keywords

Cloud Computing, Load Balancing, Energy Efficiency, QoS

# A Review of Conformal Cooling Channel in Plastic Injection Moulding Process

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## Abstract

Nowadays plastic injection mould is mostly used in plastic manufacturing industry. In injection molding process, the cooling channel performance is one of the most crucial factors because it has significant effect on both production rate and the quality of the plastic part. Most advanced technologies developed nowadays focus on issues such as minimizing manufacturing cost and improving product quality. Cooling system design is one of the most critical factors to reduce cycle time. Conformal cooling is the concept which can reduce cooling time and improve product quality as well. However, cooling system layout is restricted by traditional molding method. For cavities with irregular geometry, the distance between cooling channels and cavity may vary throughout the part. This causes local heat accumulation and some product defects such as sink mark and warpage. By using some non-conventional methods such as laser sintering, cooling channels can get closer to the cavity surface than using traditional method. This leads to a shorter cooling time.  In order to reduce the cycle time and control the uniform distribution of temperature, it is necessary to create conformal cooling channels which conform to the shape of the mold cavity and core. This project work presents a simulation study of different types of cooling channels in an injection  molded  plastic part and compares the performance in terms of cooling time, temperature profile and part warpage  to determine which configuration is more appropriate to provide uniform cooling with minimum cycle time. Autodesk Moldflow Advisor simulation software is used to examine the results of the cooling channels performance. Cooling phase takes more than 2/3 of the whole cycle time making it the most dominant factor among the other components of the cycle. The influence of cooling channels discussed by comparing straight drilling cooling channels  with conformal cooling channels . The incorporation of conformal cooling channel can improve the thermal performance of an injection mould, though it may comprise the structural and mechanical stability of the mould.

## Keywords

plastic injection mould, Autodesk  Moldflow , sink mark and warpage.

# The Menace and Catastrophe of Artificial Intelligence In Future

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## Abstract

In recent years, Artificial Intelligence has picked up a high pace in the IT industry. Not only in the IT industry, but also proved successful in maintaining its position in other sectors as well, such as medical, agriculture, etc. It has its grip upon every aspect of human livelihood. The work of Artificial Intelligence has highly been praised and expected to do better day by day.

However, after inspecting the Artificial Intelligence in a long run, it can be noticed that it somewhere violates the definition of the word "machine". In a simplified form, the term "machine' signifies "anything that reduces human efforts". If we look closely, to keep the term "machine" alive, the participation of humans should be actively present, whereas the rise of AI has recently changed the real meaning and focusing on minimizing the involvement of humans; that's what we have to worry about. In the modern era, Artificial Intelligence has occupied most of the profit-making areas that were once exclusively under control by humans. It has affected the jobs sector and still affecting. According to Oxford, humans have lost 45% of the jobs to the AI machines, within 10 years. And by the recent datasets, it can be assumed or predicted that in the upcoming years, the AI would inevitably be going to affect the human's existence by promoting and supporting inflammation, poverty, famish due to the lack of jobs.

The target of this abstraction is to produce an outline of the dark side and destructive nature of the AI and how to overcome the risk and maintain the balance. There is no doubt in the fact that the field of Artificial Intelligence has become the hottest topic in the upcoming years, so figuring out the solutions is highly needed because if nothing could be done, this may lead to the downfall of the human race.

## Keywords

Catastrophe of Artificial Intelligence , Downfall of human race ,Machine Destruction, Technologies Inflammation, Loss of jobs, Doomsday

# Effect of Wind Field Simulation Approach on the Response of a Compliant Offshore Tower

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## Abstract

The economic production of petroleum in deep water requires innovative structures which often test the limits of fixed platform design technology. The growing demand for deep water offshore platforms has thus initiated the development of economical but equally reliable alternatives in the last decade or so. As a result, there are quite a few new design concepts of offshore platforms available presently for deep water applications. One of the promising concepts is compliant offshore towers which are developed to counter the high stiffness requirements of shallow water platforms in water depths exceeding 300 m. Compliant response is achieved by controlling the mass and stiffness characteristics to de-tune the natural frequencies of vibration, relative to the frequencies of the periodic forces of wind and waves. Since they are compliant, these structures must be designed dynamically. Also, since they are exposed to loads which vary in a nonlinear way and are themselves mechanisms which behave in a nonlinear manner, their analysis is highly complex.

Articulated towers are among the compliant offshore structures that freely oscillates with wind and waves, as they are designed to have low natural frequency than that of ocean waves. This paper deals with the dynamic behavior of a double-hinged articulated tower under two different wind field simulation approaches (single-point and multi-point). The analysis includes the nonlinearities due to fluctuating buoyancy, variable added mass and instantaneous tower orientation. The nonlinear equation of motion is derived by Hamilton's principle. The equations of motion are solved in time domain by using Wilson-θ method. The root mean square (RMS) and maximum values along with salient power spectral density function (PSDF) of surge and bending moment are presented under high and moderate sea states. The results establish that the multiple-point analysis, which includes lack of correlation over the entire structure, results in response estimates lower than that of single-point formulation.

## Keywords

Multi-point wind field, dynamic analysis, compliant tower, wind induced response, offshore

# Prediction of Outbreak and Mitigation Strategies for COVID-19 using Classification Algorithms

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## Abstract

COVID-19 is a contagious disease caused by the recently emerged SARS-CoV-2 strain belonging to the *Coronaviridae* class which was previously unidentified. It has affected more than 185 countries to date with the whole world racing towards finding a cure to eradicate it. Due to its chaotic and rapidly growing nature, it becomes difficult to forecast the situation and choose a mitigation strategy to control its spread. This can be tackled using machine learning and statistical techniques which are a set of algorithms that get updated based on the experience obtained from the data. In the pursuit of finding a solution, we implemented a two-stage approach, wherein forecasting the number of cases using the Kalman filter and regression techniques comprise the first stage. The second stage involves data augmentation with additional features like the demographics which are further used to predict mitigation strategies using popular machine learning algorithms such as Random Forest Classifier, kNeighborsClassifier, etc. Using the Radius Neighbors Classifier, we obtained a hamming loss of 0.082, which is the lowest among other algorithms implemented.

## Keywords

COVID-19, Machine learning, Mitigation measures, Kalman Filters, Regression, Classification

# A Review: Material & Type of Process Parameter Used in FDM

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## Abstract

FDM is one of the highly used AM (additive manufacturing) technologies having the ability to manufacture very complex shapes. The mechanical properties of FDM parts are strongly dependent on process parameters selected during fabrication. In this review, FDM polymer type, process parameters and its effect on mechanical properties and accuracy has been studied. The result shows that ABS and PLA is the most widely used polymer and process parameters have significant effect on mechanical properties and accuracy.

## Keywords

FDM, ABS, PLA, Mechanical properties, Accuracy, Parameter

# Design Modification in Front Door of Oven for Rotomoulding Machine

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## Abstract

Rotational moulding or rotomoulding process is used to make large hollow plastic structures like water tanks, barricades etc. This process has various advantages like low cost of equipment per unit product, short lead time, easy to operate etc. compared to other important processes in the plastic industries like extrusion moulding, injection or blow moulding. In this paper, the modes of heat losses in oven of bi-axial rotational moulding machine have been reduced. The deformation of front door of oven has been found high and due to that the working condition was found improper. The entire actual condition has been simulated using thermo-structural analysis in ANSYS workbench. The maximum deformation has been found as 15.33 mm. The various solutions have been proposed to reduce the deformation. Each solution has been simulated using finite element method and deformation of front door for each proposed solution has been determined. The deformation of door for final solution has been found as 2.89 mm which is almost one-fifth from the actual deformation.

## Keywords

Oven, Rotomoulding, Door, Thermo-structural analysis, Heat losses.

# Polygonal Matrix Representation and Isomorphism Identification among the Planar Kinematic Chains

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## Abstract

In terms of computational complexity theory, the isomorphism identification is NP-Problem and one of the most challenging task in structural synthesis of kinematic chains (KCs).

The abstract polygonal [AP] matrix is used to represent the KC mathematically and also helpful for recognising isomorphism between the KCs. In this method, first the given KCs are represented by [AP] matrices. In order to recognize isomorphism, the absolute sum of Eigen values of abstract polygonal matrices [AP] are considered as an invariants. If the isomorphism exists among, the absolute sum of Eigen values of [AP] matrices will be identical otherwise vice versa. The proposed method accurately recognizes isomorphism up to 12 links KCs with no counter examples found in the literature. This method is examined for one degree of freedom (1-DOF), 10 links planar KCs and 12 links 2-DOF planar KCs.

## Keywords

Abstract Polygonal, KC, [AP]

# Future Engineering: Artificial Intelligence

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## Abstract

Perhaps, in post COVID-19 era, the future of engineering may take a distinct shape, especially in India. Probably, future engineering, whether it must be industry 4.0, service sector or agricultural sector, may accommodate environmental issues in it. The sudden coming of this global pandemic changed the scenario worldwide. Now, instead of being global, economies are preferring to grow regionally according to their own interests. Actually it was clear after the countries coming out of the E.U., trade war between China and India, China and U.S. and India and U.S., changed stand of U.S. on Paris climate agreement that self-interest of countries would be on priority.

Artificial Intelligence (A.I.) can better be regarded as future of engineering in most complex situations in present era. According to the scientist John McCarthy, father of artificial intelligence, "A.I. is the science and engineering of making intelligent machines, especially intelligent computer programs." The term A.I. was coined by him in 1955 and was proposed by him and other computer experts in 1956, at the University of Dart Mouth seminar in the U.S., that causes the birth of A.I.

A.I. refers to the ability of a computer or a computer enabled robotic system to process information and produce outcomes in a manner to the thought process of human learning, solving problems and decision making. In addition to that, the gosl of A.I. systems is to develop systems which are capable of tracking complex problems in the ways similar to human logic and reasoning.

Machine learning (M.L.) is a subset of A.I. that uses statistical techniques to give computers to learn from data without being explicitly programmed. A.I. and M.L. have been used interchangeably by many organizations. To make it clear, M.L. denotes a progam's ability to learn while A.I. includes learning along with other functions.

The above stated was about the goody-goody about the A.I. However the critics indicate limitations of A.I. in comparison to the human brain, the skill and decision making in crucial point of time. In this regard, it will be a matter of good faith to quote Jack Ma, the founder of Alibaba and an authority on the subject. He warned "The audience at the World Economic Forum 2018 at Davos that A.I. and the big data were a threat to humans and would disable people instead of empowering them.

In Indian context, where Human resource is available easily, cheaply and qualitatively, we must have a mindset as expressed by Jack Ma.

## Keywords

# Enhancing Cyber Security with Help of New Technology and Awareness

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## Abstract

Use of social media is increasing rapidly at the global level. Network system is now so large that almost everyone is on social media. During the lockdown, CSC e-governance service India which holds the license for providing internet services, recorded an increase in data consumption from 2.7 to 4.7 terabyte and its keep growing. Due to this, all the data of users is now online whether its personal information or official data or any bank account detail, all information are available on the network. Now, the security of the data is the biggest challenge for the users. On one side the IT sector is trying to make everything available online and making life easier for people. But, on the other side there are some people who use it wrongly and doing thing like cybercrime. During the lockdown 1,308 cybercrime cases are registered with a jump in Bank fraud and scams. A lot of work needs to be done on cyber security, so that we can restrict all that crimes that are happening on an internet. In my opinion there can be several solutions to this problem like,

People need to be more aware of internet.

We have to implement such a security channel which has two-three level of security to   decode which is difficult for any hacker to crack.

It is also very important to follow the guidelines issued by the government for security

## Keywords

# Effective Conduct of Online Classes for Engineering Mathematics Course during COVID-19 Lockdown

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## Abstract

The Coronavirus 2019(Covid-19) pandemic has forced all the teachers to work from home. The lockdown brought the regular traditional classes to stand still all of a sudden in between a running semester (Jan-May). As a result, we had to do a lot of re-thinking and re-planning of courses from offline to online. Even though "Black swan events" like the ongoing pandemic rattle us and throw us far away from our equilibrium and comfort zone, teaching and learning have become far more paramount during this crisis. In this paper, we touch upon the three essential aspects of learning in online mode i.e., Delivery, Engagement and Assessment for effective commencement of online classes employing ICT tools for freshmen engineering graduates. The feedback received from students has shown that e-learning lead to more effective learning, its super flexibility and its comfort for learning.

## Keywords

Learning Management System (LMS), Google Classroom, ICT tools, online resources

# Replacement of Steel Reinforcement by Fibre Reinforcement in Reinforced Concrete Beam-A Review

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## Abstract

Fibre reinforced polymer (FRP) bars used for internal reinforcement of RC beams which provides better solution to reduce corrosion problems in different types of structure. In recent years, evaluation of shear capacity of FRP reinforced beam as point of research. Glass fibre's reinforced polymer (GFRP) bars has been taken as solution in major project in concrete technology. The rusting of steel reinforcement is one of major problem that shorten the lifeline serviceability of concrete structures GFRP bars as an efficient and economical method to overcome the corrosion problems. Purpose of this paper focuses on behaviour of beams reinforced with GFRP bars and concrete strength in high performance concrete beam. Flexural strength, crack pattern and different failure modes were studied on beam specimen. As design of deformability point of view, FRP beam in this study are safe.

## Keywords

Crack patterns, failure mode, Flexural strength, FRP reinforced beam, Flexural behavior

# An Overview on Preprocessing Technique in Data Mining

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## Abstract

Data mining defines as extracting information from hug set of data is multidispinaries field, drawing work from area include database technology, machine learning, pattern recognition, AI etc. So it is important these data to be processed before being mined processing data is an essential step to enhance data efficiency. Low quality information is available various data sources and on the internet. some of the most common technique that are almost used in every situation and will be dealing about in this paper data cleaning ,data integration ,data reduction, data transformation. In this paper description of data preprocessing technique which used for data mining and supervised learning.

## Keywords

Data mining, preprocessing, Data cleaning normalization

# Genetic Algorithm to Priority Based Fuzzy Goal Programming Model for Solar Power Driven and Wirelessly Charged Electric Car

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## Abstract

This paper demonstrates how the genetic algorithm (GA) method can be used in the process of solving a fuzzy goal programming (FGP) formulation of an Electric Car which is charged wirelessly and which uses alternative energy for recharge

First, the model of such Car with all its components is presented. In the model formulation of the problem, the different types of goals associated to the wirelessly charged Electric Car Model are fuzzily described. Then, a pre-emptive priority based FGP model on the framework of the Electric Car for achievement of the highest membership values (unity) is developed with optimal usability.

In the optimization model solution process, GA is employed in the formulated performance model of the car on the basis of the assigned priorities.

In the decision process, both the GA and Fuzzy are employed so as to optimize the charging capacity with overall performance taking into consideration the issue of self-discharge.

The constructional framework of this optimized Electric Car model is pictorially represented.

## Keywords

Electric cars, Fractional Programming, Fuzzy Goal Programming, Genetic Algorithm, Wireless charging

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# Disease Diagnosis and Prognosis Using Various Data Mining Algorithms: A Brief Survey and Future Research Directions

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## Abstract

Data analytics encompasses development of optimized machine learning based algorithms that gain knowledge of identifying, distinguishing and extraction of complex patterns within huge amount of data to achieve maximum efficiency. In health care, the data mining application is by and large used as a decision support system for clinical decision making to predict survival of new patients. The data generated by health care industry nowadays can be processed for knowledge extraction that can facilitate support and assist in automating biochemical/biological analysis, diagnosis, accurate prognosis, and risk assessment for enhanced disease supervision and outcome. A data mining algorithm which is applied in healthcare industry plays a significant role in both prediction and medical diagnosis of various types of diseases. Together with the data mining, healthcare industry has come forward with a number of timely and early detection systems from the clinical and diagnosis data that are consistent and reliable for predicting different diseases besides assisting the diagnosis for the doctors in making their clinical decision. Healthcare data sets are extremely imbalanced data sets and have the most missing values and hence the resulting prediction is often erroneous when run by the classifiers. There has been no appropriate data mining method to resolve these issues. The scope of this paper is to provide a brief overview of literature on the various data mining algorithms and models concerned with the prediction of various diseases particularly in prediction of heart disease, thyroid, lung cancer, breast cancer, diabetes, psychiatric diagnosis (Parkinson's disease, Alzheimer disease) etc. adding to the literature on healthcare and data mining. This paper also presents and evaluates the results of past researches and their proposed certain classification algorithms for predicting various diseases to diagnose a disease through a survey of literature of a decade from 2010 to 2020.Sufficient survey and literature has been dedicated in this field and the most recent and up to date research findings reveal the potential of data mining in the health care and disease diagnosis territory which are evidently presented in this review. The goal of this study is to identify and evaluate the most commonly used data mining algorithms and present an overview of the current research being carried out using the data mining techniques for disease prediction from various datasets. The paper concludes with the research directions for the diagnosis and prognosis of various diseases.

## Keywords

Data Analytics, Literature Review, Disease Prediction

# Experimental Analysis of Mechanical Property Bamboo Fiber/Carbon Particle Mixed Reinforced Biocomposite

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## Abstract

In the research work experimental study of bamboo fiber/carbon particle (BF/CP) with araldite 106 epoxy resin. Bamboo fiber is an type of Natural fiber reinforced composite (NFRC). Today NFRC have been used worldwide in many fields of our lives to save the environment. This research work presents Bamboo fiber/carbon particle (BF/CP) composite is made through using matrix sandwich technique influenced by araldite epoxy resin with hardener. In this bamboo fiber, carbon particle, epoxy resin included. Bamboo fiber/carbon particle with araldite 106 epoxy resin reinforcing agent of adhesive bond is very good. From the help of the araldite 106 epoxy resin we are making the composite sheets.In this paper we are prepare three samples. In this $1^{st}$ sample, we take E50%+BF25%+CP25% and $2^{nd}$ sample, E50%+BF30%+CP20% and In $3^{rd}$sample we also take E50%+BF35%+CP15%. These are three sheets to hold at room temperature for 24 hours. After solidification of sheets we check their mechanical characteristics. We check there mechanical properties from tensile test and flexural test. We check the tensile test by Universal testing machine (UTM) and check the Flexural test by three points bend test. The results have clearly shown the epoxy resin composite reinforced with bamboo fiber has better mechanical properties. And then check mechanical tensile strength by universal tensile testing machine after this test average value of tensile strength 135Mpa and flexural test by three points bend test after this test average value of flexural 45Mpa. This composite used in automobile, railway, aerospace, business, building, construction, etc.

## Keywords

# Microstructure and Residual Stress Distributions in Friction Stir Welding of Aluminium 6061

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## Abstract

FSW/FSP is a solid state metal joining process used for micro structural modification, the material undergo into plastic and thermal deformation resulting of which significant changes in microstructure can be seen and uniform distribution of the particles with fine recrystallized grains. The aim of the investigation was to study the effect of welding heat input and post weld natural aging on residual stress, microstructure and precipitation distribution in different zones of FSW of 5mm thick plates of Al6061- T6. The induced residual stresses due to friction stir welding as a function of distance from the centre point of the tool using curve fitting techniques and Determination of residual stresses by the XRD. The data were compared to the data given by the FEM technique. The residual stresses in both the cases showed a double peak distribution. The peak residual tensile stresses were identified at 3 to 4 mm distance from the weld zone to nearer to heat affected zones. The pattern of residual stresses of the friction stir-welding is almost symmetrical about the centre of the tool. It is slightly on the higher side in left side of the weld joint as compared to right side of the weld, which appears reasonable due to the rotation direction with lead side. The residual stress pattern of FEM is in good agreement with that measured by XRD and shows the practicability of the technique for evaluating residual stresses in welded joints and a marginal difference in magnitude is observed. Although the X-ray diffraction method was recognized as a surface technique because of its low penetration ability, the residual stresses obtained by X-ray diffraction were regarded as the reference stresses here. The reason was that in this study, the measurement of the released displacements and the stresses of the specimen top surface were obtained. In fact, the variations of residual stresses through the thickness in a thin welded plate were usually small and could be neglected in most cases.

## Keywords

# Analysis and Design of Diagrid Structure – A Review

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## Abstract

As the building height increases the effect of lateral loads goes on increasing & becomes more critical than the effect of gravitation loads. Diagrid structure system has a unique geometric configuration so it is structural efficient & has aesthetic potential. In the case of the diagrid system, the diagrid angle is of prime importance, Hence the finite element method is used for the analysis of the High Rise Building to obtain the most efficient angle of Diagrid Structure. Analysis Results in terms of the time period, top story displacement & inter-story drift are compared for different High rise buildings with a varying number of the storey & presented. The Results & seismic analysis of high rise building with steel diagrid system with uniform & varying angle of diagrid are Round to be safe. From this study, it is found that for 40, 50 and 60 story structures uniform diagonal angle 63°, and for 70 & 80 story uniform angle 69°, is best suited. Hence this is concluded that as height increases aspect ratio increases which tend to increase the optimal angle. Stiffness based manual design for diagrid members is also carried out.

## Keywords

High rise building, Seismic analysis, Steel Diagrid, Stiffness based design, IS: 800- 2007

# Strength Enhancement of Wood Plastic Composites (WPC) With Addition of CACO3 Fillers

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## Abstract

Wood plastic composite (WPC) is a composite made of different chemicals with natural saw dust of teak wood, which consists of chemicals like PVC as the primary additive with $CaCo_3$, Ca-Zn for stabilize the process, Impact modifiers as propylene with foaming agent, and maleic anhydride for proper mixing of wood and chemicals to form homogeneity. This research includes development of different compositions Composition 1 (PVC-50%, $CaCo_3$-40%, Wood powder-3%), Composition 2 (PVC 50%, $Caco_3$-40%Wood powder-5%), Composition 3 (PVC-40%, $Caco_3$-50%, Wood powder-4%) WPC using the extrusion process. By preparing the PVC into powder form from the crystal form through the pulverization method for upto212μm and which is followed by hot mixing cold mixing with different additives and with of teak wood powder and extrusion of WPC is carried out which is followed by cooling and cutting process for desired length .

This research also includes investigation of mechanical properties like Tensile, Compression, Bending, Hardness Impact and Moisture absorption test of different compositions of WPC's as per the ASTM standards. The comparison study of the different compositions, the composition 3 is having high tensile, compression, bending strength which have low moisture absorption capacity hence it's having less shrinkage due to humidity.

**Experimental values**

| Sl.no | Tests carried out | | Teak wood | Composition 1 | Composition 2 | Composition 3 |
|---|---|---|---|---|---|---|
| 1 | Tensile test | | 4.10 Mpa | 7.69Mpa | 9.61Mpa | 12.82Mpa |
| 2 | Compression test | | 40.7 Mpa | 11.42Mpa | 12.14Mpa | 15Mpa |
| 3 | Bending test | | 67.1 N/mm$^2$ | 15.264 N/mm$^2$ | 15.984 N/mm$^2$ | 21.024 N/mm$^2$ |
| 4 | Impact test | Izod | 0.59N-m/ mm$^2$ | 0.274N-m/ mm$^2$ | 0..297 N-m/ mm$^2$ | 0.308N-m/ mm$^2$ |
| | | Charpy | 0.59N-m/ mm$^2$ | 0.274N-m/ mm$^2$ | 0.285N-m/ mm$^2$ | 0.320N-m/ mm$^2$ |
| 5 | Moisture absorption test | 2Hrs | 2.2% | 0.524% | 0.759% | 0.398% |
| | | 7Hrs | 12.95% | 1.572% | 1.660% | 0.716% |
| 6 | Hardness | | 4.5 BHN | 7.255 BHN | 7.255 BHN | 7.255 BHN |
| 7 | Density | | 630 kg/m$^3$ | 699.2 kg/m$^3$ | 715.2 kg/m$^3$ | 1004.8 kg/m$^3$ |

## Keywords

Wood plastic composite (WPC), ASTM

# Secured IoT Solutions for Home based Automation System

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## Abstract

This document discusses the security of home automation with the adaptation of Internet of Things.The Internet of Things (IOT) is a new boom in the technology world where physical things (home appliances, digital watches, etc.) are connected to the internet and there are new frameworks which give new ideas and imaginations to humans which are processed using cloud technology. With modern home designs, the living lifestyle has changed drastically. Brilliant home designs give an automation feel to the users to automate daily tasks. As technology has led dynamic change in the environment of household conditions, it has led to new security, validation and authentication challenges of this modern world. With all its advantages IOT also brings about some challenges which we need to tackle if we want efficient and safe use of IOT in home automation where we cannot risk the privacy and safety of our loved ones living in our homes.

## Keywords

Home automation, Internet of Things, Security, CIAAA, Honey Encryption

# Efficient Load Balancing Using Improved User Priority Model in High Performance Computing Environments

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## Abstract

The expected job completion time estimates given by users in a high performance computing platform are needed to be accurate.  Otherwise the system may under-perform due to inefficient allocation for job runtimes. Considering these accurate job runtimes helps us obtain better load balancing results. The proposed work studies the implications of using an improved user priority model based on penalty and aging of job requests combined with least load variance method to improve the load balancing across grid resources. Simulation results using real time workloads establish time and again that load balance efficiency of the proposed scheme that considers the implications of modeling these user priorities outperforms the methods void of it. The results obtained are compared with existing methods in terms of parameters like response time, wait time, tardiness and average resource utilization in high performance computing environments.

## Keywords

Grid Computing, Load Balancing, Resource Utilization, Task Response Time, User Priority

# Inventory Model Based on Fuzzy for Deteriorating Objects in a Supply Chain System with Cost Dependent Requirement and Without Backorder

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## Abstract

This particular paper has an endless inventory design for the terrible depreciation of assets within the supply chain management system with cost based demand. The truth is, it is seen that will the processing time associated with almost every supply string system is uncertain, therefore we describe it as an asymmetric triangular fuzzy (or fluffy) number. Signed-distance method is employed to de fuzzify the particular cost function. To illustrate the proposed model the numerical example and level of sensitivity analysis with respect in order to different associated parameters possess been showed.

## Keywords

SCM, cost-rice, Triangular fluffy number, signed metric method, MSC 2020: 90B05

# A Review on Green Housed Solar Dryer

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## Abstract

Drying phenomena is done for removing the moisture content from the various product like fruits food etc. Recently, development of greenhouse dryers, namely, solar tunnel dryer, solar tent dryer, improved solar tunnel dryer, and roof type even span solar greenhouse dryer has been studied by various researchers. In this paper, dryer below natural convection type and forced convection type are studied. Greenhouse dryer gives a very high quality product than open sun drying and it reduces the crop losses. It has been observed that use of greenhouse dryer under forced convection reduces moisture content in a very less time as well as drying rate is very fast and relative humidity is less than natural convection mode.

## Keywords

Green house solar dryer, natural convection, forced convection, food products, agricultural products

# The effect on vibration damping during piezoelectric energy harvesting

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## Abstract

This experimentation work presents the vibration damping of structure along with energy harvesting using piezoelectric materials. The working principle of piezoelectric material is to convert mechanical deformation into electrical voltage and vice versa. The piezoelectric material has two effects viz. direct effect and converse effect. In this experimental work, the advantage of direct effect of piezoelectric material has been employed. Experimentation is done on circular plate. Natural frequency of plate is obtained by FFT analyser. Structural damping of plate has found out when no piezo stacks applied on it. After that Piezoelectric materials are applied on the circular plate. On application of piezoelectric material, the estimation of amount of damping and the amount of energy harvested due to vibration has been obtained. The amount of damping is calculated by half power method. The result shows that piezoelectric material can damp out vibrations effectively.

## Keywords

Piezoelectric energy, damping, FFT analyser

# Artificial Intelligence and Human Collaboration for Future Military

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## Abstract

Expert systems (ES) are computer systems that help solve real-world problems, or generally require explanation from human experts. Artificial Intelligence Based Support helps increase system efficiency. Artificial intelligence not only allows for reduction and synthesis of data, but also for the development of predictions about future events and for discussions about outcomes. The nature and extent of the threat to security has drastically changed and led to major causes for the soldiers. The military calls for expert systems to increase the ability to understand and process critical information on the battlefield. The human ability to analyse all the data is not enough because the modern battlefield is even more important. This summary describes how humans and artificial intelligence systems collaborate to achieve better capabilities. Human and expert system cooperation gives quick and accurate results for any task. The efficiency of the expert system is capable of doing all the things without an involuntary human being with better results. In addition, Human-Artificial Intelligence cooperation in the military is essential for military combat zones and national security. This is the result of super powerful artificial intelligence help in the armed forces.

## Keywords

Expert Systems, Artificial Intelligence, National Security

# Managing Pandemics like CORONA with the Help of Blockchain

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## Abstract

Blockchain is a decentralized, distributed, trustless protocol that combines transparency, immutability, and consensus properties to enable secure, pseudo-anonymous transactions with no central authority. We now face a critical need for such innovation, in personalization and data science prompt patients to engage in the details of the healthcare and restore agency over their medical data. This will help us to maintain the data record which will help further in handling the pandemic situation like COVID-19. We can integrates existing providers with local data storage solutions and facilitating interoperability which will make our system convenient and adaptable. We incentivize medical stakeholders (researchers, public health authorities, etc.) to participate in the network as block chain "miners". This provides them with access to aggregate, anonymized data as mining rewards, in return for sustaining and securing the network via Proof of Work.

## Keywords

Blockchain, Covid-19

# Monitoring Weld Quality from Acoustic Signatures of GMAW Welding Using Neural Network

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## Abstract

In manufacturing and structural industries the gas metal arc welding (GMAW) are widely using as their basic operation. And the market demands and competition creates lot of challenges among the industries. And it is the concern about the monitoring and quality of weld quality is a big challenged and interesting area for researchers and practitioners.

Impact of COVID19 shows us how world is changing drastically and to manage manpower and resources is a big challenge in industries. Now the research interest is moving in the direction of automating maximum process such as in welding process so that industries can deliver the products with superior quality with fewer defects as well as with the use of minimum man power.

We cannot cut down man power to zero but we can reduce their efforts by making use of technologies in their process of welding. In this paper we have discussed the process of quality control for GMAW with respect to its input parameters mainly sound, current and voltage variations by using the open loop control.

## Keywords

Covid-19, Weld Quality, GMAW

# Experimental Analysis of Electricity Consumption against Electricity Generation with Thermoelectric Generator

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## Abstract

We are focusing on the implementation of waste heat recovery system in automotives, as huge portion of heat generated in internal combustion engine is released to the environment by the exhaust system or engine cell itself, because of this waste heat, the η (efficiency) of automobile devices are reduced so much. ATEGs (Automotive Thermoelectric Generators) are the semiconductor devices that produce electric potential difference when a thermal gradient develops on it and vice-versa. A Specific study is shown in this paper to understand the requirement of power generation against power need for exterior lights with the help of thermoelectric generator. This paper deals with the study of TEGs performance at different temperature scale.

## Keywords

ATEG (Automotive Thermo-electric Generator), TEM (Thermoelectric Module)

# Semi-solid Metal Casting Process: A Review

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## Abstract

It was in the early 1970s that semi-solid metal processing has been developed as a new technique for metal forming.It combines the advantages of both casting and forging.The conventional casting often contains internal structural defects that lead to poor mechanical properties.In this review paper we mentioned about semi-solid metal casting process.We tried to cover all the basic information about SSM and also mentioned about recent works on the semi-solid metal casting.

## Keywords

SSM, Mechanical Properties

# Smart Home – Scope, Challenges and Future

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## Abstract

Nowadays electronic applications and facilities have changed the daily life of mankind. Several E-facilities like E-mail, E-commerce, E-trading, E-marketing etc. have changed the traditional activities. This has been trend setter and mankind is becoming habitual for it. Almost every area is acquired by electronic applications. Construction field is also not away from this trend and electronics applications are getting used in it. This paper discusses the future, scope and challenges in the implementation of smart home by considering electronics applications in view.

Smart home can be considered as a house of which activities are controlled automatically and more importantly by electronic means. In these facilities like automatic ON / OFF devices, theft prevention, remote status observation, device remote control, hazards detection etc. are installed. All these devices work smartly and have decision making and communication abilities.

**Scope of smart homes**

Smart homes are getting attention for the buyers which provide additional facilities like automatic switching of electrical appliances on arrival or in presence of person. The environmental conditions of homes can be regulated as desired. When home is locked any entry of unauthenticated person can be avoided / recorded or suitable desired action can be taken automatically like informing police station or security guards of the home. Irrigation for gardens can also be controlled regularly and at desired time or by monitoring the soil conditions. The advantages of smart home are as below

1) Security enhancement
2) Prevention of undesired activity / Recording any activity
3) Automatic regulation and control of electrical appliances
4) Energy management
5) Controlling devices remotely
6) Scheduled day to day activities

IoT technology is in boom nowadays, it can be used in home automation. The advantage of miniaturization in IC manufacturing technology and sensors development can be taken. Tiny microprocessors and controllers can also be used.

**Challenges in smart homes -** The main challenge is the cost of entire system which contributes in the cost of home. Further after getting damaged or malfunction it needs to be changed. In under developed country it is still not economical solution. There is scope in increasing the accuracy, range, coverage area of the sensors. In case of video surveillances systems, moving object detection and identification are major challenges. New protocols are required to be developed and there is a need of standardization of equipment.

**Future of smart homes-**Smart home enhances security and offers several advantages. Considering this, people may prefer such homes in future. The importance of such homes may be understood by people or government agencies like police departments may suggest use of smart homes for security enhancement. If the present cost get lowers then surely the popularity of smart homes will be enhanced.

## Keywords

Internet of Things, Smart homes

# IoT Based Smart Agriculture Techniques

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## Abstract

Agriculture is a backbone of Indian economy, it is proving the 70 % job opportunity to the Indian population, now a days farmers are facing manpower problem, it may be due to migration of the manpower. Result is that agriculture facing manpower problem. Moreover, need to manage the infinite resources in agriculture. Computer application for precise management is a novel weapon to increase the resources use efficiency. Crop-dusting is the cumbersome, boring job of a farmer that can be taken over by drones to save time, resources and health. Drones can carry tanks of fertilizers and pesticides in order to spray crops with far more precision than a tractor. This helps reduce costs and potential pesticide exposure to workers who would have needed to spray those crops manually. Mapping and crop-dusting, combined, make drones very smart and active farmers since they can analyse crops with precision and respond appropriately. In this paper, we proposed internet of things based on smart agriculture architecture. The proposed architecture consists of various layers and performs smart agriculture work and perform agricultures based task in easy way.

## Keywords

Internet of Things, Precise Management, Smart Agriculture

# A Secure Decentralized Virtual Machine Migration Approach in Cloud Environment

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## Abstract

Cloud computing is a progressive technique in modern digital world. It mesmerizes more users by offering various services based on their necessity over the use of resources. As cloud users grow rapidly, it may precede to high energy consumption. To augment the energy consumption, concept of virtual migration (VM) is employed. At the time of VM migration, the data is migrated from one host to another. In such cases, the intruders may eavesdrop the data during the time of VM migration. This is the reason that secure data transmission is considered as a challenging task. Thereby the proposed work focuses on secure data migration. Decentralized VM migration approach (DVMM) is used for selecting the VM for migration task along with Advanced Encryption Standard (AES) for data encryption.

## Keywords

Data Migration, Encryption, VM migration, Energy consumption, Data Transmission.

# A Brief Review of Classification Algorithms Using Data Science Tools

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## Abstract

Data innovation has reformed the entire world with less expensive and quick correspondence through various modes. Every one of these devices create heaps of information which should be prepared to extricate valuable examples of information or data. The database technologist are looking for intends to store, control and recover information while information mining region is endeavoring hard to track down new and proficient procedures for data extraction structure the tremendous measure of information. Data Mining is additionally alluded by the names like Knowledge Discovery in Database (KDD) or Predictive Analytics or Data Science. The different strategies utilized for extraction are hereditary algorithms, decision trees, artificial neural systems, enlistment and perception. Data mining is commonly an iterative and intelligent revelation process. The objective of this procedure is to mine examples, affiliations, changes, abnormalities, and measurably huge structures from huge measure of information.

## Keywords

Data mining, Knowledge Discovery, Database, Techniques

# The future of E-vehicles- Opportunities and Challenges

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## Abstract

E-vehicles are getting attracted by consumers and researchers working in the field of electrical engineering. E-vehicles uses recharging batteries and motor driving converter circuits. Upon charging the battery the E-vehicle is expected to run for few kilometers till the battery discharges. Again the battery should be charged. The biggest advantage of E-vehicles is use of electric power and not petroleum fuels. Due to this the country's dependency on the petroleum products will be minimized. This paper presents advantages, opportunities and challenges in development and commercialization of E- vehicles.

**Advantages-**

1) No use of petroleum products as fuel hence fuel cost is zero.
2) Lowered maintenance & repairing cost due to absence of conventional engine
3) Simple construction
4) Get charged on electric power which is available almost everywhere
5) Comparatively higher eco-friendly product, no smoke hence no contents of $CO_2$ and CO
6) Cost can be lowered

**Opportunities**

1) E-vehicles can be manufactured in India, even they can be manufactured at domestic level and used for domestic applications.
2) Potential to generate employment and business opportunities
3) Vehicle cost can be reduced after mass production and entry of many vendors in manufacturing
4) There is great scope for research in enhancement of mileage of vehicle on charging the batteries.
5) There is scope to enhance the infrastructure for charging the E-vehicles

**Challenges**

1) There is great scope in infrastructure development for charging the vehicle
2) Research scope for increasing the mileage
3) Reliability improvement of converter circuits used in it
4) Though it is considered as eco-friendly product, but it generates E-waste which creates pollution. There E-waste disposal is more challenging
5) Over 100 mechanical components from conventional vehicle are omitted. Therefore there is possibility of losing jobs and work in the field of conventional mechanical automobile industry. There is big challenge to accommodate this man power in this new sector of E-vehicle industry. Possibly many technicians working in servicing and repairing in automobile industry have threat of losing the job and they have to shift to new area or new type of work.

## Keywords

E-vehicles, E-waste, Eco-friendly, Pollution

# Concept of Bio-Digester System:  Uncooked Kitchen Waste to Useful Energy

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## Abstract

Large amount of uncooked kitchen squander is gotten from eateries, restaurants and homes. The waste can be utilized for producing bio-gas which can be used as fuel for various applications. The kitchen waste can be conveniently obtained from hostel mess or local restaurant. Sodium hydroxide (NaOH) was added to keep up the alkalinity and pH value. Basic design of a digester system for producing bio-gas from uncooked kitchen waste is presented.  The digester system is based on anaerobic digestion.  Gas obtained is renewable as it is obtained from kitchen waste. It is also environmental friendly and cheap. Utilizing waste in digester takes care of waste disposal issue. Gas was found to burn with blue flame. Various design aspects of bio-digester and its working is presented in this paper. Advantages and applications are also presented.

## Keywords

Digester system, bio-gas, kitchen waste

# Drone Deployment for Rapid Medical Response: A Case in Bengaluru

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## Abstract

Bengaluru, India is regarded as one of the world's most highly traffic congested cities. Like every other big city, the numbers of automobiles on the street has risen with the population in Bengaluru on a linear scale in the last few years. As a consequence, road pollution in Bengaluru is serious and because of this one of the majorly affected services is emergency care. A recent report shows it takes an ambulance service at least 20-25 minutes to respond to every serious problem, struggling to locate the ailing person(s) and bring them to the hospital on time. Emergency doctors claim that the 'Golden hour' affected by this phenomenon, which leads to further complications or even death. This damage can be significantly reduced by an effective and rapid reaction approach to rescue and offer life-supporting first aid to injured individuals. In this article, we propose a framework for employing drones that can address the medical emergency problems faced by ambulance services by delivering medical assistance in major cities such as Bengaluru during the 'Platinum Time'.

## Keywords

Drones, Emergency Medical Service (EMS), Platinum Time, Rapid Medical Response, Bengaluru.

# Application of Particle Swarm Optimization in Vehicle Routing Problem

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## Abstract

The vehicle routing problem is considered as one of the most well-studied problems in the discipline of operations research.  Many optimization techniques have been used to solve this problem. Also, the use of metaheuristic techniques in optimization have shown significant improvements in the solution. The particle swarm optimization (PSO) is one of the nature-inspired metaheuristic techniques widely used in solving optimization problems. This paper discusses about particle swarm optimization technique for solving the vehicle routing problem (VRP). The proposed algorithm for solving the vehicle routing problem makes use of particle swarm optimization (PSO) algorithm, swapping algorithm and randomization. The algorithm is appropriate for solving complex vehicle routing problems and other more difficult combinatorial optimization problems within a very short computational time. This algorithm is tested on a few benchmark instances and it has been observed that it has produced very satisfactory results. The algorithm is highly ranked amongst the most known and is an effective algorithm in the literature and one of the best amongst all nature- inspired methods that have been used for such problems.

## Keywords

Particle Swarm Optimization, Vehicle Routing Algorithm

# Mechanical properties and Wear characteristics of AlTiB$_2$ composites

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## Abstract

Aluminum alloy composites are most widely used in the field of Aerospace and Automobile industries in the recent decades because of its unique properties such as density (light weight in nature) and strength to weight ratio. Studies on Aluminum metal matrix composites has most widely gained popularity in the research area.   The present work emphasis on the synthesis of AlTiB$_2$ composites (0%, 5% and 10% wt.), evaluation of mechanical properties and study of wear behavior of the composites. During the present investigation, it was found that the variation in the amount of reinforcement (TiB$_2$) has a substantial influence on the hardness, tensile strength and wear resistance properties of the composites. The investigation also reveals that as the    weight fraction of TiB2 reinforcement increases in the Al2011metal matrix composites the hardness, tensile strength and wear resistance increases.

## Keywords

AlTiB$_2$ composites, Alumnium metal matrix

# Hierarchical Ontology Based Word Sense Disambiguation of English to Hindi Language

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## Abstract

The research carried in this paper clearly reveals that there are numbers of issues when it comes to question paper translation which should be effectively handled by applying suitable approaches and WSD algorithms in order to have an MT system which could be used for practical purposes. The further study and the analytical work carried in the present research to develop an efficient machine translation system would greatly reduce the dependency on human experts in translating questions into different Indian languages for various exams that require bilingual papers. This paper proposes an algorithm based on a hierarchical ontology which uses a tree structure. It uses a bilingual dictionary for the purpose. Corresponding to each English word respective Hindi words are assigned weights using the training data weights of the terms are updated by using TF (Term Frequency). Use of Hierarchical structure reduces the time of translation while ambiguity was also reduced. The experiment was done on a real dataset of questions of English language of NCERT and Other Source.

## Keywords

WSD Algorithms, Term Frequency, NCERT, MT System

# Behavior of RC Column under Different Types of Loading Condition– A Review

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## Abstract

Columns are one of the most important members in structural systems of buildings and bridges, are often subjected to one or several load combinations. To transfer such loads greater sections are required to design, which affects floor area and overall cost of construction. High Performance Concrete (HPC) widely used in piers, abutments of bridges and columns subjected to compression loading. HPC has improved in last ten year due to its properties like high compressive strength, and greater modulus of elasticity and reduction in sectional dimensions. These properties are attracting structural designer to use HPC. These paper presents, study of behavior of HPC columns under concentric, eccentric, and biaxial loading. HPC columns with different properties such as compressive strength, shape, slenderness ratio, different longitudinal and lateral reinforcement are studied under concentric compression load, eccentric compression load and biaxial loading. Cracking phenomenon also observed when the columns subjected to axial compression loading and biaxial bending.

## Keywords

Axial loading, biaxial bending, column, High Performance Concrete, Cracking

# Design and application of a lead compensator to a guided missile control system

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## Abstract

Phase lead compensation is an important and reliable method for classical control design in the frequency domain for continuous time systems. This paper is concerned with the design of a lead compensator using Bode plot for a laser guided missile to satisfy the required performance specifications. Simulation studies are carried out in MATLAB which shows that the compensated system meets the desired specifications.

## Keywords

Phase lead compensator, Missile control system, Bode plot

# A Review on Contribution of Solar Thermal Technologies and Photovoltaic system for achieving Zero Energy Building

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## Abstract

Nowadays buildings are silent energy guzzlers all over the world. Up to 40% of energy is consumed by the building for heating, cooling and other essential purposes. One-third of greenhouse gas is emitted only by buildings so thereby for reducing the energy consumption as well as Green House Gas. We have focused on renewable technology in which solar systems are preferred because of easier availability of solar energy widely. This paper reviewed solar water heating technology, solar cooling system, standalone PV system and grid connected PV system. In this paper the basic component of solar water heater and the types of solar cooling system is described. . In order to fulfilling the rest demand of energy standalone PV system and grid connected PV system is discussed with their components.

## Keywords

Zero Energy Building, Green House Gas, Photovoltaic System, Solar Water Heating, Flat Plate Collector

# Fore casting of Biomass energy to Hydrogen Generator as Green Thermal Fuel development

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## Abstract

The hydrogen economy has gotten significant consideration in scholarly, modern and political settings. There are open doors for huge decreases in ozone-depleting substance discharges, expanded vitality security and more noteworthy in general effectiveness. Be that as it may, if hydrogen is to turn into an essential vitality hotspot for electrical force age, just as a transportation fuel, novel age pathways will be important to satisfy the expansion in need. This article explain review promising method for creating hydrogen is the thermochemical change of biomass to a blend gas, made out of a blend of hydrogen, carbon monoxide, carbon dioxide and methane. An analogical review paper can be make an approach that help to make research prospective vast and improved to create the hydrogen generation.

## Keywords

Hydrogen generation, Thermochemical, Fuel cell

# Studies on the Effective Removal of Arsenic Heavy Metal Ions Using Egg Shell Powders

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## Abstract

In this paper egg shells were used as a low cost adsorbents for the removal of Arsenic trioxide AS (III) heavy metal ion particles using the batch experiments. The experiments were conducted by varying the experimental parameters like contact time from (15, 30, 45 and 60 minute), pH from (3, 5 and 7), adsorbent dosage from (1g, 2g,3g, and 4gm) and adsorbent size (53, 150 and 350micron size).SEM, EDAX studies were done to characterize the egg shell particles. Fourier transformer infrared spectroscopy test (FTTIR) was conducted to study the adsorption rate. From the experimental results, it was observed that highest percentage of As(III) was removed when the experiments were conducted using smaller size egg shell particles, with 15 minutes of contact time, with a pH of 7 and increasing the adsorbent dosage didn't result in increase in the adsorption rate.

## Keywords

Egg shell powder particles, arsenic trioxide, batch experiments

# Opportunities and Challenges in Solar PV Power Stations

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## Abstract

Solar photovoltaic (PV) systems are no longer new technology nowadays; it's now getting popularity and attention. It converts solar energy to electrical energy, which depends upon insolation or the sunlight intensity. Solar energy is abundant available in India and considering this there is huge scope to use and implement solar PV power stations at several places. In India hydroelectric power stations are used to generate electrical energy which need huge amount of water. Further there are several difficulties in transmitting this power to remote places. However this task also has been achieved in spite of several difficulties, but since solar PV technology is getting attention these days; there is scope to implement solar PV power stations for generation of electricity. Few opportunities and challenges involved in this area are presented below.

**Opportunities in Solar PV power stations**

1) Still the power supplied to several places is generated at dams, where huge generators are used for power generation. This need sufficient annual rainfall, enough storage of water in dams etc. Any deficiency in these two factors minimizes the electricity.

2) Plenty of solar energy is available and is going to be waste; it can be used for electricity generation. PV power stations can be implemented at different levels like village, urban, city area etc. to generate and supply the electricity to consumers. This way every power station shall act like an isolated source of energy. These isolated sources can be connected to each other and a network can be formed. Depending upon power requirement, energy management can also be done.

3) This will bring independence in electricity generation at different levels. Further in case of any malfunction, energy management can be done by using the excess electricity generated in nearby power station.

4) The generated power can be used for industrial area. Thus the power can be supplied at minimum cost.

Challenges in PV power stations

1) Initial investment cost is the major challenge, as arrays of costly PV modules are required to be connected in series and parallel. The cost of PV modules has not been lowered and is not at cheap rate, though their performance has been improved.

2) Space is another challenge, as they occupy hectors of area for generation of electric power.

3) Condition monitoring of PV power stations is another issue, since there are difficulties in involvement of manpower in technical problems like trouble shooting, replacement etc. Condition monitoring will surely help to locate, repair and replace the fault.

4) There is great scope in increasing the amount of electricity generation per square inch of the area of PV module. Generation of huge energy by using less number of PV modules is still challenge today.

5) There is scope to do research at material level for obtaining good throughput.

6) In rainy seasons the electricity generated is very low, this is also one another problem which need to be tackled.

## Keywords

Solar photovoltaic (PV) systems, PV Power Stations

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# Making Data Secure In Cloud Computing

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## Abstract

Cloud computing is an internet-based omnipresent, on-demand network model for convenient network accessibility (e.g. Servers, Applications, Services, and Networks) for a pool of computing resources on a requirement basis. The software &amp; data that is accessed by the user may be stored in various servers at different places. This is a security threat for both the service providers and users. Cloud Computing is gaining popularity day by day. If the security parameters are taken care of, many businesses and government departments will move into a cloud-based ecosystem. In this research, we take a broad view of cloud computing through authentication and encryption. An authentication method is required at an initial level which can be implemented by cloud service providers. It is a simple way of authentication that can be used by the end developers along with secure encryption.

## Keywords

Cloud Computing, Authentication, Encryption, Security, big data

# Studies on Carbon Nanotube Reinforced with Aluminium 6061 Metal Matrix Composites

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## Abstract

Metal matrix composites play a vital role in the aerospace industry due to its light weight, high strength to weight ratio. To take advantage of the high tensile strength and electrical conductivity of Carbon Nano Tube materials and for Metal Matrix Composites to possess these optimal properties some synthetic techniques are developed. These techniques must be economically producible, homogeneous dispersion of reinforcement in the matrix and realise strong interfacial adhesion between the matrix and the reinforcements. This paper emphasizing on the production of Al-CNT MMCs through power metallurgy route. Commercially available Al6061 used as base material and MWCNT with wt 1%, 1.5% and 2% used as a reinforcement. The mechanical properties of these composite materials were investigated with microvickers hardness tester. The results of the test revealed that the Al-CNT composites with 1% CNT increase in the hardness value compare to base material. It was found that with increase in the % CNT the hardness increased. On the whole, these results indicate that the Al-CNT composites can be considered as an outstanding material, besides weight savings, the most important benefits of composites include non-corrosive, non-conductive, flexible, resistance to dent, low on maintenance, long life and design flexibility. Aluminium alloys have wide range of application in industry because of their low density, good workability and relatively low yield strength whereas reinforcement adds rigidity and impedes crack propagation to a great extent. So as to analyze the effect of reinforcements on mechanical, corrosion and wear properties. This research outcome Corresponds to decreased density, increased hardness for significant increase in CNT content of the newer composite developed and tested. Microstructure image reveals that even dispersion of CNT in the base material. The CNT reinforcement can greatly improve overall properties of the resultant composites.

## Keywords

Al6061, MWCNT, Powder metallurgy.

# A Novel Method for Currency Identification using Machine Learning Algorithms

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## Abstract

Currency is the backbone of Indian economy. Currency counterfeiting is a serious crime that affects a country's finances. India is facing more serious problems due to the increase in fake currencies in the market. In recent year, Currency Identification is an important area of the research. The Government of India (GOI) declared the demonetization of all Rs. 500 and Rs. 1,000 bills on November 8, 2016. There was also an introduction of Rs. 500 and Rs. 2,000 new currencies in exchange for demonetized currencies. After demonetisation, there are many Fake currencies came into limelight. As a solution, various fake currency detection methods are available worldwide, but most of them are hardware-based and are not cost-effective. In the advent of technology, Image processing plays an important role in currency identification. The proposed system will be useful to detect counterfeit currencies in banking systems. Feature extraction is the most important technique for pattern recognition based on texture analysis. The proposed system can identify the legitimacy of currency by checking specific security features such as watermarks, latent images, security threads, etc. Identification of counterfeit currencies is done using Machine Learning Techniques. The methodology involves extracting and encoding these security features. Security features are extracted from the input image, feature detection and classification are performed using different Machine Learning Algorithms. This approach presents a novel method for currency identification based on feature extraction method using Machine Learning Algorithm. The ultimate aim of this approach to calculate the accuracy of the distinct method of Machine Learning. In the end, this method improves the accuracy of currency identification.

## Keywords

Currency, Image Processing, Machine Learning, Security Features, Feature Extraction, Counterfeit.

# Analysis and Prediction of Heart Disease Using Machine Learning

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## Abstract

Heart disease is biggest challenge for medical professionals. Modern life style made it an epidemic; according to a survey conducted by WHO heart attack is leading cause of death all over the world especially in the western world. It is surveyed that 23% of the death in US is due to Heart related disease. It has been observed assistance is needed for helping medical professionals in detecting the chance of heart attack in the human. In recent times a lot of work related to providing an automated support system for predicting chance of Heart attack in human has been done. After advancement of computer science, researchers felt that they can help in some of the key interdisciplinary areas like medical science. Machine learning techniques are compared on the single data set which does not reflect true potential of any algorithms. They also suffer from some of the key anomalies such as accuracy and manual data set pre-processing. In this paper, I propose Machine learning algorithms like Logistic regression and Decision tree for giving the most accurate results for heart attack prediction. It is tested on one dataset to find out true potential and providing certainty in the accuracy. Method also promises to remove all the mentioned anomalies from the system like lack of accuracy and automated approach in pre- processing of the data set.

## Keywords

Heart disease, Machine learning, logistic regression, decision tree

# An Overview on Stircasting Process and Its Parameters

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## Abstract

Conventional stir casting process has been employed for decades to produce discontinuous particle reinforced metal matrix composites .This review paper is on the method of stir casting and process parameters of stir casting. We have also discussed recent works on stir casting process. Stir casting is generally accepted as a particularly promising route among the variety of manufacturing process available for Metal Matrix Composite (MMC).The limitations of the process are also discussed in this paper.

## Keywords

Particulate aluminum metal matrix composites (PAMMCs), Metal matrix composites (MMC), Stir casting

# Prediction of COVID 19 Using Machine Learning

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## Abstract

On day one no one you know is sick. It feels like a normal day. It may stay like this for a long time until one day a few people you know are sick and suddenly few days later you will see everyone is sick. It feels like it happened so instantly everything looks fine until it isn't. This is paradox of pandemics. My project revolves around the most recent pandemic we're facing, i.e. Covid-19. The objective of this project is to come up with strong machine learning model using machine learning algorithm to make predictions on such issues. The goal of this task is to come up with something that predicts the spread of the virus in next few days. We will analyse the outbreak of coronavirus in the coming days across the country, visualize them using charts and graphs and predict the number of upcoming cases for the next few 20 days using Linear Regression and SVM model in python.Now this objective has been broken down into certain tasks. The first of which is to analysis present condition of India. Second, we need to find out similarities and diff b/w the trend in India during the same stages in Wuhan, South Korea, Italy and France. Visualize each case using charts and graphs. Finally, we predict the world wide Covid-19 cases using SVM model and linear regression which comes under machine learning. The model will be written in Jupiter and it's being executed using collab.

## Keywords

Covid-19, SVM model

# Effect of Increased Loading at Individual Buses on the Voltage Regulation in an IEEE -9 Bus Radial Microgrid Feeder

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## Abstract

Much interest has been shown in recent times in the designing of rural microgrids with satisfactory performance. A rural microgrid distribution system generally involves radial feeder networks. The configuration of the feeders, the load demands at different buses and the lengths of the feeder sections in the network decide two issues of interest to the system operator. These are first, the overall losses in the distribution network and secondly the voltage levels (voltage profile) at various buses in the network, including the voltage regulation at last buses. These features of performance are computed using load flow analysis.

One of the related issues of interest is to examine how the power factor of the increased loading at any particular bus of the radial feeder will affect the voltage regulation of the feeder. The power factor can be variable or constant with the increased loading at a particular bus. Further, the variable power factor may involve the greater contribution of the real power vis -a'- vis the reactive power or vice versa leading to loading at improved or worsening power factors. In the case of the situation with loading at a constant power factor, both real and reactive components are increased equally in magnitude.

The present study uses a IEEE 9-bus radial feeder network, typically expected for use in distribution networks of rural Microgrids in developing countries. Load increments are carried out at each of the 9 buses, turn by turn, in which the base loadings are increased. Two types of changes have been implemented, i.e. increase in loadings at variable power factor and increase in loading at constant power factor

Using the *Forward-backward Sweep method* of distribution load flow analysis, the percentage voltage regulation is obtained for the feeder under different operating conditions when the loading of buses is done one at a time. The following operating conditions cases have been taken up:

(1) Case 1: Loading at individual buses with increasing power factor for active load increases only – 1.5 times, the base value.

(2) Case 2: Loading at individual buses with increasing power factor for active load increases – 2 times the base value.

(3) Case 3: Loading at individual buses with decreasing power factor for reactive load increases only – 1.5 times, the base value.

(4) Case 4: Loading at individual buses with decreasing power factor for reactive load increases only – 2 times, the base value.

(5) Case 5: Loading at individual buses at constant power factor by simultaneously increasing both active and reactive loads by 1.5 times the base value.

(6) Case 6: Loading at individual buses at constant power factor by simultaneously increasing both active and reactive loads by 2 times the base value.

With each of these changes carried out one at a time, there are changes in the bus loadings (real and/or reactive powers) and also the power factors of the loadings at the different buses.

The study shows the increasing the loading at various buses in a radial feeder taking each bus one at a time will show in general worsening regulation at buses further from the sending end. The role of the power factor is also crucial in deciding the magnitude of the worst level of percentage regulation and also the bus at which the loading operation is carried out. It is also felt that the variable base loading at each bus may additionally influence the observed differences in the regulation magnitudes.

Various performance graphs for the changes in voltage regulation under each type of load change are presented with discussions on the perceived variations as indicated.

## Keywords

Forward-backward Sweep method, Microgrids, IEEE-9 bus radial feeder network

# Algorithmic Solutions for High Quality Video Editing Software Problems

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## Abstract

It is said that paper has more patience than man, but a video has far more expression than a paper or a picture. As video is the sequence of kinetic images. The modern world accepted the video content more than words and touched the human life in almost every extent. Since it is growing faster there are various challenges related to it like enormous burden on the acquisition, storage, compression, and transmission of video data. Video editing is not only used in professional movie making but also in various areas like education field, marketing fields etc (ex. Since lockdown due to covid-19 the education world started classes online). Today we have more popular video cameras to manage the video data but algorithmic solution is needed to solve various problem related to the video editing. There are also more opportunities in quality degradation, video security, video copy detection etc. In this paper we are going to deal with the motion analysis, abrupt transition detection, gradual transition detection etc. Some algorithmic approaches are also used to cope with the modern video editing software problems.

## Keywords

Video editing, Shot, Cut-point, Frames

# Bilevel Programming Formulation for Electric Power Generation and Dispatch under Uncertain Environment

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## Abstract

This work presents how a Bilevel Programming (BLP) in a hierarchical decision structure can be efficiently used for modelling and solving the electrical power generation and dispatch problem under uncertain environment. In the proposed approach, first the objectives, economic power generation and atmospheric emission, and certain decision vector are fuzzily described by introducing imprecise aspiration levels to each of them in the decision making situation. Then the concept of tolerance membership functions in fuzzy set theory for measuring the degree of satisfaction of the decision makers (DMs) regarding goal achievement of the fuzzy objectives of the decision vector controlled by the upper-level DM are defined in the decision making horizon. In the solution process, a GA is introduced to reach highest membership value (unity) of the defined fuzzy goals of the problem to the extent possible and thereby to arrive at a satisfactory decision in the decision making environment. To illustrate the potential use of the approach, the problem tested on IEEE 6-Generator 30-Bus System and the model solution is compared with the solutions obtained in the previous study.

## Keywords

Bilevel Programming, Power Generation, Fuzzy logic

# Metamaterial – The New Hope for Future

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## Abstract

Metamaterials are the artificially designed or tailored materials with unusual or specific properties. It can be created with any desired parameter not available in nature. We can design metamaterial with required mechanical, electrical, acoustical, and electromagnetic properties. Usually it's a nanoscale composite with periodic structure.

Applications of optical metamaterials are also very promising. Super lens, Meta surface, plasmonics, negative index material (NIM) can bring the revolution in the field of sensing and imaging. Low weight and compact devices may be devised .Cloaking devices have also drawn attention of scientific community up to great extent.

## Keywords

Super lens, Plasmonics, NIM.

# Regression Analysis of Covid-19 Spread In India

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## Abstract

Machine learning has become one of the most important model to predict the future values. Machine Learning is used to make exact decisions based on observations and predictions. Machine Learning examines the areas of algorithms that can make high-end predictions on data [1]. With the ever increasing amount of data becoming available there is good reason to believe that smart data analysis will become even more persistent as a necessary ingredient for technological purposes. Linear and polynomial regression model has been used to investigate the COVID-19 outbreak in India using time series epidemiological data up to 20th June 2020. The polynomial regression model for India and its different states is trained with data from 21$^{st}$ March 2020 to 19th June 2020 (90 days). The performance of the model is estimated using test data of 7 days from 20$^{th}$ May 2020 to 26th May 2020 by calculating RMSE and % error. The model is then used to predict number of patients in India and its different states up to 16th July 2020. Based on the polynomial regression analysis, Maharashtra, Gujrat, Delhi,Tamil Nadu and Telangana are continue to remain most affected states in India.

## Keywords

Linear Regression; Machine Learning; Prediction

# Tyre Pyrolysis Oil: A Substitute Diesel Engine Fuel

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## Abstract

Fossil fuels reserves are depleting very fastly. Further, burning of fossil fuels generates enormous environmental pollution. Different bio-fuels such as alcohols, vegetable oils have already come into the market worldwide. C.I. engine finds wide applications in automobiles, agricultural machineries, industries etc. Therefore it is necessary to search for alternative fuel for diesel. Waste tyres are obtained automobiles which are either re-cycled or used for land filling. By means of re-cycling, waste tyres are transformed into carbon black, tyre pyrolysis oil and pyro gas. This paper reviews the characterization of tyre pyrolysos oil (TPO) as well as experimental work carried out on C.I. engine using TPO. Through this review work, an attempt has been made to collect the information available on the feasibility of TPO as a substitute diesel engine fuel. The material collected from various sources has been arranged in a systematic way so that it can give an insight into the progress of research done in this field.

## Keywords

Tyre pyrolysis oil, alternative fuel, energy from waste.

# PV Integrated UPFC

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## Abstract

This paper is based on integration of PV and unified power flow controller ( UPFC) which will help us to reduce the harmful effects on environment due to generation of electricity through conventional sources of energy and it would also help us in compensation of reactive power which will lead to improvement in power quality and power factor. In this paper a UPFC is integrated to a PV connected grid which makes it environmental friendly and provides it long life with higher quality of power. The PV module is using MPPT controller so that we could extract maximum energy of the day and other than this we are using boost converter to step up the voltage level so that it could satisfy the need of power demand .At the output of boost converter we will get the dc and therefore we need to convert it into ac voltage and for this we have used inverter through which we will get ac voltage .Next step is to integrate UPFC so that reactive power could be compensated and we get high quality of power supply. To develop this model we have MATLAB/SIMULINK software and results obtained are eco-friendly as well as efficient and dynamic.

## Keywords

PV Integration, UPFC, Grid, Power Quality Improvement

# Construction Sequence Analysis of Multistoried RCC Building with the Help of Etabs – A Review

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## Abstract

The RCC buildings we construct are mostly analysed by using linear static analysis method in single step assuming that the frame is subjected to the full load once the whole structure is constructed completely. But practically dead load due to each frame component is imposed in different stages as we construct the frame story by story. That's why the stability of the structural frame varies from one construction stage to another. Hence nonlinear analysis has to be done. Generally construction stage analysis is performed to simulate crucial stages of structure under construction and if necessary to obtain deformations and forces at each of the stage. So the difference between conventional static linear analysis and structural sequence analysis or sequential construction analysis (SCA) of rigid RC frame of different configuration is to be figured out with the help of ETABS (Extended Three Dimensional Analysis of Building System).

## Keywords

Structural or construction sequence analysis, nonlinear analysis, linear static analysis, multistoried RCC building, column shortening, ETABS.

# Resistance Spot Welding and Optimisation Techniques Used To Optimise Its Process Parameters

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## Abstract

Resistance spot welding process is one of the oldest methods used to join sheet metals using a combination of heat, pressure and time parameters. It is an economical and highly productive process and is, therefore, being used in various manufacturing industries and has a great future ahead. The present discussion deals with a critical review of spot welding carried out by different investigators. The review also includes the various methods of optimization of process parameters. The sheets to be welded are clamp together between the electrodes and current is allowed to flow. The plates get heated at the interface due to the resistance in the path of current flow. The pressure applied on the electrodes causes the heated region to yield and get squeezed together to form a weld nugget.

## Keywords

RSW, ANOVA, Taguchi method, orthogonal array, Minitab

# Performance Comparison of Link Replication Techniques for Hierarchical Interconnection Networks

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## Abstract

The present situation having needed to design such sort of frame work taking advantages of the locality of communication for planning systems with diminished connection cost. In modern era, HINs have fascinated consideration. This is because HINs give fault tolerance within the presence of some faulty nodes and/or links with reduced link cost. It is also having benefits in parallel applications for inherent synergy among communicating tasks. Various HINs gives effective locality of communication and gives adaptation to internal failure inside the nearness of some defective hubs as well as connections with reduced link cost. This paper presents a comparative analysis of Block Shift Network, dBCube, Hierarchical Hypercubes and RFH for different classes of topological properties to analysis the network cost and packing density.

## Keywords

Replication technique, Interface technique

# Green Manufacturing (GM): A Review

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## Abstract

The Industrialization has become a prospering virus in the present competitive world. The companies are endeavoring hard to support themselves. They will in general give better items and benefits and improve their manufacturing tasks in the present remarkable worldwide rivalry. Due to this reason the manufacturing sector consume huge amounts of energy and different resources and transmits a lot of ozone harming substances which increases ecological issues like environmental change – global warming, global dimming, and so on and environmental degradation. Furthermore, it also found a lot of energy is also wasted in many forms. Green manufacturing (GM) is quick rising as a sustainable manufacturing solution that can take care of most issues that the world faces today. The paper gives a review of green manufacturing, what is green manufacturing why it is required, and techniques for green manufacturing that decrease the waste and even pollution. The primary target of green manufacturing is to save nature and to reduce the expenses of the item.

## Keywords

# Review of different synthetic reinforced fiber with high viscosity epoxy polymer based on mechanical characterization

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## Abstract

An araldite-cured thermosetting epoxy polymer was modified by incorporating 10 wt.% of well-disperse fiber reinforced. The mechanical property like as a tensile property, flextural property, hardness was investigated for bulk specimens of the neat and the fiber-modified epoxy. The addition of the fiber increased the mechanical property and fatigue life more than 30% times. The neat and the fiber- modified epoxy resins were used to fabricate synthetic fiber reinforced plastic (SFRP) composite laminates by resin infusion under Sol gel method. Tensile, hardness, flexural tests were performed on these composites, during which the matrix tensile strength and bending strength was monitored. It is observed that the fatigue life of the SFRP composite was increased by about 30% due to the fiber content of 3%. Tensile strength is increased four times when percentage of fiber increased about 7% and also hardness will improve than less fiber content. It is observed from the literature that mechanical property of the composite material is increases when fiber content increased and the other content such as epoxy, etc are fixed or decreased. Developed natural and synthetic fiber composite is widely used in automobile, railways and aerospace industry.

## Keywords

# A Review of Data Offloading In Opportunistic Network through Reinforcement Learning

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## Abstract

Data offloading is a promising methodology for versatile substance dispersal services. This can be accomplished by misusing deft direct correspondence joins between cell phones. By the by, accomplishing productive Device to-Device (D2D) offloading is trying, as correspondence open doors may be, commonly, subject to singular portability designs. Accordingly accomplishing effective and opportune substance conveyance could be exceptionally testing. Two versatile offloading arrangements are proposed dependent on Reinforcement Learning (RL) structure. First is Actor-Critic strategy, in which the controller of the scattering procedure, when prepared, can choose a legitimate number of substance reproductions to be infused in the pioneering system to ensure the opportune conveyance of substance to every single intrigued client. Second is State Action Reward State Action (SARSA) in which a SARSA specialist will collaborate with the earth and update the arrangement dependent on activities taken, known as an on-strategy learning calculation. The two methodologies can consequently become familiar with an effective procedure to decrease the traffic on the cellular network, without depending on any extra substance data about the opportunistic network.

## Keywords

Reinforcement Learning, Opportunistic Network, SARSA

# Review on Mechanical & Biological Property of Silicon Dioxide & Zirconia Based Epoxy Polymer Composite

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## Abstract

This study compares the tensile and flexural properties of Sio2 & Zirconia /epoxy polymer nanocomposites. Dispersion of Sio2 & Zirconia nanoparticles in the epoxy polymer was achieved by ultrasonic mixing. Sio2 & Zirconia /epoxypolymer nanocomposites contain varying amount of nano size Sio2 & Zirconia up to 4wt.% & 3wt.% respectively. The tensile test and three-point bending test were performed to obtain the tensile strength and the flexural properties of nanocomposites respectively by different researchers. The investigated properties of Sio2 & Zirconia /epoxy polymer nanocomposites increases with the increasing other nanoparticles dispersion like as silicon oxide nanoparticles and deterioration in the mechanical properties is realized above wt.%. This may be due to the significant increase in agglomeration and settlement of the Sio2 & Zirconia nanoparticles during the long curing time. This paper also reviews the mechanical and biological properties of different nanopowder material used during composite fabrication. It has been investigate that the mechanical properties (hardness, fracture toughness, Young's modulus, and compressive strength), and biological properties (biocompatibility and bio- activity) of zirconia and silicon dioxide are favorable for the biomedical implant.

## Keywords

Epoxy, Sio2 & zirconia nanocomposites, ultrasonic mixing, tensile properties, flexural properties, biomedical implant.

# Knowledge Discovery in Geographia—A Decade Survey of various Data Mining Algorithms for Rainfall Prediction

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## Abstract

Over centuries, geographical science has grown exponentially with enormous amount of data. Although over last two decades geographical data has been reconsidered by applying machine learning algorithms on it. Discovering knowledge from the geographical dataset is very much critical for understanding the influences of climate change by analyzing the behavior of the weather for a definite time period. Rainfall forecasting is one of the important climate change task, where some specific features such as wind, atmospheric pressure, humidity, temperature, and precipitation etc. are used in the prediction of the rainfall of a particular site. It has been a challenging task in weather analysis for every (meteorologist) researcher in the current conditions. Since, the accurate and exact rainfall prediction has not been so far possible, because of its complexity and convolution measures but precise, timely & accurate rainfall prediction can lead to take various effective security measures in advance in the enduring development of the projects and plans, agricultural tasks, travel conditions and alarming flood situations etc.

Data mining and machine learning methods & techniques can be very much effective in predicting the rainfall. These methods can help in predicting the rainfall by extracting the hidden patterns from the past set of meteorological data (rainfall data). In this survey, we focused on the prediction of rainfall i.e. we prepared a brief survey on the applications of data mining in the prediction of rainfall. By this, our study will be able to help and provide the critical analysis of the latest data mining practices and algorithms used in predicting the rainfall. Various machine learning models: Supervised, Un-supervised and Ensemble models have been covered in this paper which includes Neural Networks, Support vector machines (SVM), Naïve Bayes, CART,

## Keywords

Rainfall Forecasting, Machine Learning, and Neural Networks.

# Flexural Properties of FRP Reinforced Concrete Beam: A Review

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## Abstract

The use of fiber reinforced polymer (FRP) reinforcements in concrete structure has increased in last decade because of their higher corrosion resistance, high tensile strength, light weight and good non-magnetization properties. The reinforcing steel bars in concrete structure are sensitive to corrosion that severely affect the serviceability and safety of the structure. The corrosion effect is more obvious in harsh marine environments. FRP reinforcing bars are recommended as potential alternative to steel reinforcing bars. FRP bars have been used most commonly in aggressive environment such as coastal environment and water treatment plants. This paper reviews experimental research on the flexural behaviour of beams reinforced with FRP composite bars and high performance concrete. Different parameters such as flexural strength, crack patterns, failure mode and effect of elevated temperature are concerned. The different tests on specimens and their results are discussed and compared with the results of control beam. The results illustrate that the creep, crack width and number of cracks are found more significant than steel samples. Use of high strength concrete instead of normal resistant concrete increases initial load of cracking and create more cracks with less width. Higher FRP reinforcement ratio provide better flexural performance along with higher flexural capacity, ductility, small crack width and post cracking stiffness.

## Keywords

Crack patterns, failure mode, FRP reinforced beam, flexural strength

# Human Activity Recognition System in Real-Time Environment Using Machine Learning

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## Abstract

Understanding the human activities from videos is demanding task in Computer Vision. The prime task of intelligent video systems is actions identification of the humans which accomplished in the video sequence automatically and tagging their actions. Identify the actions and objectives of one or more objects are the goal of activity recognition from a series of examination on the action of object and their environmental condition. In the Content-based Video Analytics, Human-Computer Interaction, Robotics, Human fall detection, Visual Surveillance, Ambient Intelligence, Video Indexing etc. is the primary application of Human Activity Recognition. By this model we collectively decipher the various methodologies and summarize challenges and issues of Human Activity Recognition systems.

In our proposed method, time-sequential images expressing human action are transformed to an image feature vector sequence by extracting a feature vector from each image using star skeleton. A symbol assigned to each feature vector of the sequence which corresponds to a Codeword in the codebook by Vector Quantization. By HMMs we generate the codebook. Consequently, symbol sequences are generated by using time-sequential images. The parameters of model by HMM each category are optimized in the training phase, so as to best describe the training symbol sequences from the categories of human action to be recognized. For human recognition, the model which best matches the observed symbol sequence is selected as the recognized category.

## Keywords

Machine Learning, HMM, Human-Computer Interaction, Robotics

# Marqur - A Social Platform for Location-based Content Aggregation and Discussion

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## Abstract

This project aims to realise a free, community- driven platform for hosting and promoting location based content. Users are given the freedom to create and place digital content virtually at real, physical locations using GPS coordinates. Through this platform, we can post digital images, videos or other information users may want to share, linked to that location. A new store opening, a lost pet, a music event or any other type of news or announcement can be made through this application quickly and easily. Advertisers can put up image or video ads around their service area. Significant events that happened at a street or venue can be relived through photos and videos posted there. Most importantly, all this information is contributed and curated by everyday users. Thus, we can now see a digital snapshot of any location as depicted by its residents. This gives us an authentic look at places without having to visit them first. The proposed system is developed by having a combination of geo-location, social networks, connected apps and various web services. Malicious or harmful content that violates platform policies can be reported and removed. Other content can be up-voted or down-voted by users. The more voted a post is, the more visible it is compared to the others nearby. This helps in hiding spam or posts of poor quality, while making useful posts more visible. There is also the possibility of adding live automated data feeds, such as traffic and weather, making this a complete solution for location based awareness. If needed, posts can also be set a fixed visibility duration after which they are automatically hidden. The service is free to the general public but can still generate revenue by charging advertisers, adding to its feasibility.

## Keywords

Marqur, Content Aggregation

# Optimisation of spot-welding process using a GA-Taguchi hybrid model

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## Abstract

Spot welding is a popular electric resistance welding process in which work pieces are held together under pressure exerted by electrodes and metal surface points in contact are get joined by the heat obtained from resistance to electric current. It is a faster process and enables easier joining of even dissimilar metals. The process found wide application in automotive industry. The process parameters of spot welding such as like electrode tip diameter, weld nugget, weld current, holding time, cycle time etc bear very complex relationship between them. In recent past researches have been carried out using conventional statistical design of experiment (DOE) based techniques like Taguchi method, Response surface methods, Grey relational Analysis etc for optimisation of spot-welding process parameters. But such techniques often incur poor prediction performance to optimize a process involving high mathematical complexity among parameters and experimental noise. Soft computing techniques involving genetic algorithm (GA), particle swarm optimization (PSO), simulated annulling (SA) etc can be efficiently employed for optimizing such highly non-linear problems with greater accuracy. Same has been employed already for EDM, Laser material processing, submerged arc welding etc. However, in the field of spot welding the application is very little as literature suggests. The present work has employed a hybrid GA-Taguchi- methodology for determination of optimized process parameters for a Spot-welding process. Genetic Algorithm (GA), a biologically inspired method for optimization is based on certain parameters like population size, cross-over fraction, mutation-rate etc. But selection of operating parameters is dependent on user and often its wrong selection leads to inadequate optimization output. In the present work, GA parameters have been optimized initially by Taguchi method and the optimized GA parameter so produced is finally employed for process parameter optimization of spot welding. In the present work, experimental data is taken from a published literature (Vignesh et al, 2017) where electrode tip diameter, welding current, heating cycles are considered as input parameters and tensile shear strength as an output parameter for dissimilar metal spot welding of 2-mmthick AISI 316L austenitic stainless steel and 2205 Duplex Stainless Steel sheets. Further process parameter optimization of spot welding has been carried out through following steps:

I)     *Formation of regression equation:* A second order regression equation with interaction effect is developed to model the relationship between welding parameters and output variable with adequate accuracy of $R_2$ value 0.9693. That regression equation is used as objective function during GA optimization.

II)    *Optimization of GA parameters:* Initially, Taguchi method has been employed with a four level three factor design for optimization of GA parameters and optmised GA parameters so obtained are as follows, population size=100, crossover fraction=0.8, mutation rate=0.01.

III)   *Optimisation of spot-welding parameters:* GA with optimized process parameter setting has been further used for optimizing Spot welding process parameters. The regression model developed is used as objective function during GA optimization. Finally, the optimized spot-welding parameter setting obtained for maximization of welding strength are as follows: weld tip diameter =6 mm, welding current= 9 KA, and no. of welding cycles = 9.

Analysing the optimized parameter setting with working range of process parameters it has been found that, maximum welding strength can be achieved when resistance spot welding process will be carried out with minimum weld tip diameter, maximum welding current and maximum number of heating cycles. Experimental validation of the GA output indicates an error of 1.43% which indicates the adequate accuracy of the proposed model. On employing welding with optimized process parameters would definitely improve product quality.

## Keywords

Taguchi method, spot welding, Optimisation

# Fuel Cell Driven Vehicle: En Route to Green Logistics

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## Abstract

Fuel cell continuously and directly converts the chemical energy of a fuel and oxidizer to electrical energy. Fuel cell works like a battery yet not all like a battery, it doesn't run down or needs recharging. It produces electrical energy as long as fuel is provided. It works at efficiencies a lot higher than those of IC engines and has no moving parts. Its operation depends on chemistry and not combustion, thus it produces zero emissions. Fuel cell converts the fuel (generally hydrogen) and oxygen to electrical energy; the only by-products being heat and water. When fossil fuels burns, they emit a cocktail of toxic pollutants that lead to environmental pollution. Fuel cells can confront challenge of pollution. Fuel cells find wide applications. Some of the applications include automobiles, spacecrafts and vacuum cleaners. They are also used in low power devices such as hearing aids, smoke detectors, burglar alarm, locks etc. In miniature form, they are used in mobile phones, pagers, cameras and other electronic devices. In this paper, concept of fuel cell driven vehicle is presented. Working of vehicle and challenges faced in its commercialization are also discussed.

## Keywords

Electric vehicle, fuel cell technology, zero emission vehicle.

# A Review on the Properties of Building Insulation Materials Prepared With Renewable Raw Material Resources

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## Abstract

The steady increase in energy consumption and environmental pollution has prompted the construction sector to focus on thermal insulation. Mostly; non-renewable resources are commonly used for manufacturing building insulation materials. As a result, problems arise concerning the reuse or recycling of such materials. Besides, their production requires a huge amount of energy. Therefore, using renewable raw material resources; the energy demand during production and consumption can be significantly reduced. In renewable sources, agricultural waste can be chosen as a good option because there are already several problems associated with agricultural waste management. India, an agricultural country, is rich in agricultural waste and produces 81.4 million tonnes of agricultural waste each year. Currently, a large proportion of the agricultural waste produced in India is burned or dumped. However, another important issue in India is the impact of aquatic weeds. Invasive weeds like water hyacinth (WH) pose severe environmental as well as economic problems. The conversion of these renewable raw material resources into sustainable building material is a potential remedy for such waste disposal and high dependence on non-renewable materials. The primary aim of this paper is to report on state-of-the-art thermal insulation materials made from renewable raw material resources that are not or hardly commercialized. This study examined the performance of insulating materials by evaluating their mechanical, physical, and thermal properties. Thermal insulation materials based on agricultural and aquatic biomass were analyzed in terms of characteristics such as density, water performance, flexibility, and thermal conductivity. In this paper, a comparative study of thermal insulation materials made from renewable raw material resources with conventional thermal insulation materials is also included. This study shows that most of the renewable raw material resources are very good candidates for the development of thermal insulation material, and the correct combination of natural materials is perfectly comparable with traditional material.

## Keywords

Thermal insulation; invasive weeds; water hyacinth; water performance; flexural strength; thermal conductivity

# Effect of Stress Concentration and Stacking Sequence on Tensile Strength of Notched Woven Fabric Composites

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## Abstract

Present work focuses on experimental investigation of the effect of the hole size and the specimen width on the fracture behavior of the woven-mat glass/epoxy reinforced composites. For this, 16-ply laminates comprising of three different stacking sequences: [45/-45], [0/90] and [30/60] were used. Laminates were fabricated using compression molding technique. Notch geometry was restricted to only circular shape and holes of six different diameters were considered. Specimens were subjected to monotonic tensile testing till fracture. Specimens without holes of each type of laminates were also tested. The results show that stacking sequence has a distinct influence on fracture stress in the presence of notch. Numerical results obtained using FEA were compared with experimental results. It was found that the notched fracture stresses were maximum for stacking sequence angles [+45/-45], and differ significantly from those of the [0/90] and [30/60]. As per the point stress criterion (PSC) the hole size and specimen width have the influence on the characteristic length ($d_o$).

## Keywords

Composite laminates, Stacking sequence, Point stress criterion, Notch strength, and Characteristic length.

# Sentiment Analysis of COVID-19 Epidemic using Machine Learning Algorithms on Twitter

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## Abstract

As we know, On February 11, 2020, the World Health Organization declared the official name for the illness that is causing the 2019 novel corona virus episode, first recognized in Wuhan China. More than 216 countries are influenced so far, raising worries of broad dread and expanding tension in people exposed to the danger of the infection. In the 20th century, internet user's who are using social network platforms growing exponentially and getting benefited by using the social network platform like twitter. In the current scenario many researchers working on sentiments of text on social data shared by internet or social network users.  In the form of text (tweets) on the twitter platform, people from all over the world are sharing the challenges of this COVID 19 epidemic in their feeling and opinions. Tweets in the form of text shared on twitter, we extracted the sentiments of the text (tweets) and analyze these sentiments by using the Machine learning algorithm. We can predict the positive and negative sentiments (emotions) of the people affected from the COVID 19 epidemic from our analyzed data shared on twitter a social network platform. We can protect our friends and relatives from there to be depressive or negativity behaviour.

## Keywords

COVID 19, Machine learning, Epidemic, sentiment, corona virus, social network.

# An ANN Model for Simulations on Performance of a Solar PV Water Electrolyser

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## Abstract

Hydrogen has been identified in recent times as the fuel of the future .Use of renewable energy such as solar energy for production of hydrogen is perhaps the most ecofriendly and economical approach for large scale generation. Hydrogen production using direct solar energy as the primary energy non-fossil source with electrolyser systems can be achieved in two possible ways: namely, (1) solar thermal electrical power generation and coupling with water electrolysis; (2) photovoltaic power and coupling with water electrolysis. Of these two approaches, the solar PV-water electrolyser appears to be more suitable because it involves static parts (absence of a heat engine–generator) and unattended operation. However, the solar PV water electrolyser shows a fluctuating performance when certain control parameters experience variation under normal operation. These are (a) the solar input radiation levels and (b) the temperature at which the electrolyte is maintained. Evidently, it is of interest to study the manner in which changes in either or both parameters can influence the system efficiency. To examine this issue, a simulation model needs to be developed. We have used an Artificial Neural Network (ANN) model for this investigation. The MATLAB Neural Network Toolbox has been applied for the purpose.

## Keywords

Artificial Neural Network, SOLAR PV, Water Electrolyser

# Advancements in Image Data Searching and Retrieval Approach Using 3D Histogram

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## Abstract

The retrieval principle of CBIR systems is based on visual features such as colour, texture, and shape or the semantic meaning of the images. To enhance the retrieval speed, most CBIR systems pre-process the images stored in the database. This is because feature extraction algorithms are often computationally expensive. If images are to be retrieved from the World-Wide-Web (WWW), the raw images have to be downloaded and processed in real time. In this case, the feature extraction speed becomes crucial. Ideally, systems should only use those feature extraction algorithms that are most suited for analyzing the visual features that capture the common relationship between the images in hand. In this thesis, a statistical discriminate analysis based feature selection framework is proposed. Such a framework is able to select the most appropriate visual feature extraction algorithms by using relevance feedback only on the user labelled samples. The idea is that a smaller image sample group is used to analyze the appropriateness of each visual feature, and only the selected features will be used for image comparison and ranking. As the number of features is less, an improvement in the speed of retrieval is achieved.

## Keywords

Image Data, CBIR, Retrieval Approach

# Multi Parameters Based Heterogeneous Clustering Algorithm for Energy Optimization in WSN

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## Abstract

Wireless Sensor Network (WSN) consists of tiny sensor nodes that are able to sense data from vicinity and send this data to the sink or Base Station (BS). The main issue during data collection is the non-rechargeable energy resource or battery. So the data collection should be energy efficient for long use of WSN. As we know that clustering is one of the most efficient technique for saving energy in WSN.

Purpose of the paper is to find out multi-factor based clustering process having four conflicting factors:

a) delay based on remaining energy, maximum power transmission etc., b) average lifetime of normal sensor nodes, c) lifetime of CHs, and d) maximum power consumption by any normal node. The algorithm is developed with an economical approach for finding CHs using a fitness function. Optimal path is also found utilizing the "d0" distance. Results are far better than the traditional algorithms.

## Keywords

Wireless sensor network (WSN); Clustering; Delay; Re-cluster; Lifetime of Nodes; Lifetime of CH; Maximum Power Consumption.

# Study of Nature Inspired Optimization Techniques for Image Contrast Enhancement

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## Abstract

Optimization of image contrast in is a challenging and a typical area of study in image processing. A small change in intensity, color, texture, camera distance and size may affect the image presentation with a big difference. The paper presents various nature inspired popular optimization techniques for image enhancement like genetic algorithm and swarm based optimization techniques.

Particle swarm optimization (PSO) and cat swarm optimization (CSO) are used for the parameter tuning process in histogram stretching and image enhancement techniques. Appropriate solutions may be found faster and more effectively by using optimization algorithms in the image enhancement techniques. This paper has found that particle swarm optimization (PSO) is one of the most well- regarded stochastic, population-based optimization techniques in comparison to genetic algorithm and other swarm based optimization techniques used for image enhancement.

## Keywords

Contrast Stretching, Histogram Equalization, Genetic Algorithm, Swarm optimization

# Advanced Traffic Management System Using Internet of Things

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## Abstract

Traffic management systems are considered as one of the prominent dimensions of a smart city. With the continuous growth of population and urban mobility in metropolitan cities, traffic congestion is common on roads. To tackle various issues for managing traffic on roads and to help authorities in proper planning, a smart traffic management system using the Internet of Things (IoT) is proposed in this project. A hybrid approach (combination of centralized and decentralized) is used to upgrade traffic flow on roads and an algorithm is devised to manage various traffic scenarios efficiently. For this purpose, the system takes traffic density as input from a) cameras b) and sensors, then operates traffic signals. Another algorithm based on Artificial Intelligence is used to predict the future traffic density to minimize the traffic congestion. Besides this, RFIDs are also used to give priority to emergency vehicles such as ambulances and fire brigade vehicles during a traffic congestion. In case of fire hazards on the road, Smoke sensors are also part of this system to detect this situation. To demonstrate the efficiency of the proposed traffic management system, a prototype is developed which not only optimizes the flow of traffic but also connects nearby rescue and emergency departments with a centralized server.

## Keywords

Internet of Things, RFID, Traffic management system

# Review of the Public Ration Distribution System by Government in Rural Areas

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## Abstract

Public Distribution System (PDS) is an Indian system to ensure food security. The traditional PDS is used to distribute grocery items to India's people who are valid ration card holders. The validity and the distribution of the ration card is monitored by the state governments. However, there are a few concerns about the efficiency of the distribution process. The main drawback in the current distribution system is that the PDS has been criticized for its urban bias and its failure to serve the poorer sections of the population effectively. Also many retail shopkeepers have a large number of bogus cards to sell food grains in the open market. Many dealers resort to malpractice since they acquire less salary. Most of the time users do not get their rightful entitlement in terms of quantity. In order to make it efficient and improve the current system of PDS we need to develop e-Ration Shop. Here we are going to make a website for shopping purposes. Using this website ration card holders can order his/her grocery items from the e-Ration shop online. The main reason for developing this website is making this process computerized and to remove the drawbacks of the present way of issuing products based on ration cards. In these times due to Covid-19 having huge lines in front of ration shops is very risky so above research will help from infection with corona also.

## Keywords

PDS, e-Ration card, grocery items, Shopkeepers

# Indoor Navigation using Augmented Reality

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## Abstract

This paper introduces the idea of Indoor Navigation using Augmented Reality. With the increase in building complex structures, people of different age may find it difficult to navigate within such structures. It is often difficult to find your way to the destination you are looking for. This paper provides a solution for this trouble using available and accessible resources. Using this application, a shop within a shopping mall, a specific room in a hotel, a department building in a vast engineering college etc., can be easily located and also, the user is provided with reasonably accurate visual assistance through their smartphone to reach his/her preferred location. The proposed system is inspired by augmented reality and uses software development kits such as Vuforia and Unity to develop an application. 2-D Visual markers are the fundamental elements used in this system. Multiple visual markers are placed within the complex building structure and on scanning these visual markers using the application, users are led to their destination. The application allows the user to choose their preferred destination before they start navigation and also permits them to change their destination in between. Users are provided assistance using arrows pointing to the correct direction. This application is made in such a way that users of all age can use it and ensures a quality of life for all.

## Keywords

Augmented Reality (AR), Global Positioning System (GPS), Virtual Reality (VR)

# New Revolution: Industry 5.0

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## Abstract

These days the world is enduring the fourth mechanical revolution named Industry 4.0, which consolidates physical universe of genuine articles with their "virtual twins". The man with his mind, inventiveness and will lies past this philosophy. Presently the picture of another worldview of Industry 5.0 could be seen. It is broadly acknowledged that the coming of mechanical autonomy and computerization in past modern unrests achieved outlook changes in the assembling business around the world. It is consequently possible that the fifth mechanical transformation will achieve a comparable move in standards and roll out crucial improvements in our way to deal with industry and assembling. From the main mechanical upset to the fourth, science and mechanical advancements, preparing and capital, were the key components in developing how items are considered, structured and produced. Anticipating the fifth mechanical unrest all things considered, there will be a worldview change in how industry will advance given the devices of industry 4.0; the web of things, digitization, blockchain, propelled materials, added substance produce, man-made brainpower and apply autonomy, drones, vitality innovation, biotechnology, neurotechnology and virtual and increased reality.

## Keywords

Industry 5.0, Industry 4.0, mechanical transformation, innovation

# The utilization of Grey Incidence Analysis approach and ANOVA for optimization of process parameters of Hybrid Machining on Soda Lime Glass

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## Abstract

The materials that exhibits low strain values at failure are known as brittle materials. Conventional machining process for the machining of brittle is very difficult. Various non-conventional machining are adopted for the machining brittle materials. The limitations of these processes are overcome by hybrid machining process which is the combination of conventional machining and non-conventional machining or two non-conventional machining processes. The present work focuses on blending conventional with non-conventional process to form a novel hybrid machining process called the Hot Air Assisted Machining (HAAM) process. The influence of hot air on Material Removal Rate (MRR) and Surface Roughness ($R_a$) on grooving operation is discussed. Taguchi L27 orthogonal array is considered for the design of experiments. Major influencing process parameters were obtained by Analysis of Variance. Grey Incidence Analysis is used to obtain the optimal combination of process parameters. It is observed that the temperature of the hot air influence in higher MRR and lower $R_a$.

## Keywords

Hybrid machining, MRR, Ra, SEM micrographs.

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