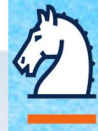




# IEMIS 2022

Theme: Data Mining, Machine Learning, IOT and Information Security



Springer

## 3<sup>rd</sup> International Conference on Emerging Technologies in Data Mining and Information Security

23rd to 25th February, 2022



**Organized By**

**Department of Computer Application and Science**

**Institute of Engineering & Management Group, India**



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## **TABLE OF CONTENTS**

<b>Sl. No</b>	<b>Subject</b>	<b>Page No.</b>
<b>1</b>	<b>About the Conference</b>	<b>i</b>
<b>2</b>	<b>Acknowledgement</b>	<b>ii</b>
<b>3</b>	<b>Conference Committee</b>	<b>iii</b>
<b>4</b>	<b>Keynote Speakers</b>	<b>vi</b>
<b>5</b>	<b>Session Chairs</b>	<b>vii</b>
<b>6</b>	<b>Co-Session Chairs</b>	<b>x</b>
<b>7</b>	<b>Host</b>	<b>xi</b>
<b>8</b>	<b>From the Desk of Editors</b>	<b>xii</b>
<b>9</b>	<b>Abstracts of Contributed Papers</b>	<b>1</b>

## About the Conference

3<sup>rd</sup> INTERNATIONAL CONFERENCE ON EMERGING TECHNOLOGIES IN DATA MINING AND INFORMATION SECURITY (IEMIS 2020) which will be held at Institute of Engineering & Management, Kolkata, West Bengal, India on 23-25<sup>th</sup> February, 2022 will be organized by the School of Information Technology (Ashram Campus), a unit of Institute of Engineering & Management, Kolkata. This Conference will be a joint effort of the Institute of Engineering & Management (IEM) Saltlake. It is technically sponsored by **The SMART Society, USA, Sciences and Technologies of image and Telecommunications (SETIT) Sfax University, Tunisia, Scientific Innovation Research Group (SIRG), Egypt, CI2S lab, Buenos Aires, Argentina and Scientific Research Group, Egypt.**

The Conference deliberations will be on the following themes:

- Data Mining
- Information Security
- Machine Learning
- Smart Technology

The Conference is to bring together innovative academics and industrial experts in the field of Computing and Communication to a common forum. Conference aims:

- Endow opportunities for academicians, scientists, and research scholars along-with professionals, decision makers, and industrial practitioners to deliver and confer their research contributions.
- Inspire young scholars to learn newly created avenues of research at an international academic forum.
- To churn out the hidden aspects of data science in the perspective of Make in India a successful project
- The conference will provide opportunities for publishing research papers in different indexed journals.

We would like to specially invite you to the Keynote session of renowned professors of the world who have immensely contributed towards Computational Intelligence. We look forward to welcoming students, researchers, academics, research scholars and allied science and engineering professionals with interest in Data Mining, Information Security and beyond.

We are pleased to present an interesting and engaging schedule to inspire the participants and we commend this conference program to you. Throughout the three days of the conference, you will have the opportunity to attend the keynote, plenary & invited talks and the special sessions or move freely among them.

**Dr. Abhishek Bhattacharya**

## ACKNOWLEDGEMENT

The theme and relevance of IEMIS has attracted more than 800 researchers/academicians around the globe, which enabled us to select good quality papers and serve to demonstrate the popularity of the IEMIS for sharing ideas and research findings with truly national and international communities. Thanks to all those who have contributed in producing such a comprehensive conference proceeding of IEMIS.

The organizing committee believes and trusts that we have been true to their spirit of collegiality that members of IEMIS value even as also maintaining an elevated standard as we have reviewed papers, provided feedback and presented a strong body of published work in this collection of proceedings. Thanks to all the members of the organizing committee for their heartfelt support and cooperation. We have been fortunate enough to work in cooperation with a brilliant International as well as National Advisory, Reviewer, Program and Technical Committee consisting of eminent academicians to call for papers, review papers and finalize papers to be included in the proceedings.

We would like to express our heartfelt gratitude and obligations to Springer, to be a part of IEMIS 2022. We are extremely grateful to the benign reviewers for sparing their valuable time and putting in effort to review the papers in a stipulated time and providing their valuable suggestion and appreciation in improvising the presentation, quality and content of this proceeding. The eminence of these papers is an accolade not only to the authors but also to the reviewers who have guided towards perfection.

Last but not the least, the editorial members of Springer Publishing deserve a special mention and our sincere thanks to them not only for making our dream come true in the shape of this proceeding, but also for its hassle free and in-time publication in the reputed LNNS(Scopus) and AISC(WoS), Springer. The IEMIS conference and proceedings are a credit to a large group of people and everyone should be proud of the outcome.



**Dr. Abhishek Bhattacharya**  
Convener, IEMIS 2022



**Dr. Soumi Dutta**  
Co-Convener, IEMIS 2022

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## Keynote Speakers

3rd INTERNATIONAL CONFERENCE ON EMERGING TECHNOLOGIES  
IN DATA MINING AND INFORMATION SECURITY  
Organized by Institute of Engineering & Management Group  
Kolkata, India

**IEMIS 2022**

**KEYNOTE SPEAKER**

 **Prof. Xin-She Yang**  
Middlesex University,  
The Burroughs, Hendon,  
London,  
United Kingdom  


Date: 23/02/2022  
Time: 04:30PM - 05:30PM

Meeting Link: <https://zoom.us/j/98461404301>  
Meeting ID: 98461404301

**IEM** Date: 23rd - 25th February, 2022

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**IEMIS 2022**

**KEYNOTE SPEAKER**

 **Prof. Vincenzo Furi**  
Computer Engineering,  
University of Milan,  
Italy  


Date: 24/02/2022  
Time: 12:30PM - 01:30PM

Meeting Link: <https://zoom.us/j/98461404301>  
Meeting ID: 98461404301

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**IEMIS 2022**

**KEYNOTE SPEAKER**

 **Prof. Seyedal Mirjalili**  
Torrens University,  
Australia  


Date: 23/02/2022  
Time: 10:30AM - 11:30AM

Meeting Link: <https://zoom.us/j/98461404301>  
Meeting ID: 98461404301

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**IEMIS 2022**

**KEYNOTE SPEAKER**

 **Prof. Rafidah Md Noor**  
University of Malaya,  
Kuala Lumpur,  
Malaysia  


Date: 24/02/2022  
Time: 01:30PM - 02:30PM

Meeting Link: <https://zoom.us/j/98461404301>  
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**IEMIS 2022**

**KEYNOTE SPEAKER**

 **Prof. Rayer Zwiggelaar**  
School of Computer Science,  
Aberystwyth University,  
United Kingdom  


Date: 23/02/2022  
Time: 2:00PM - 3:00PM

Meeting Link: <https://zoom.us/j/98461404301>  
Meeting ID: 98461404301

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**IEMIS 2022**

**KEYNOTE SPEAKER**

 **Prof. Md. Abdur Razzak**  
Independent University,  
Bangladesh  


Date: 25/02/2022  
Time: 10:00AM - 11:00AM

Meeting Link: <https://zoom.us/j/98461404301>  
Meeting ID: 98461404301

**IEM** Date: 23rd - 25th February, 2022

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**IEMIS 2022**

**KEYNOTE SPEAKER**

 **Prof. Shamim Kaiser**  
Institute of Information Technology,  
Jahangirnagar University,  
Bangladesh  


Date: 25/02/2022  
Time: 03:00PM - 04:00PM

Meeting Link: <https://zoom.us/j/98461404301>  
Meeting ID: 98461404301

**IEM** Date: 23rd - 25th February, 2022

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## Session Chairs

<b>Technical Session 4.4</b> Data Science and Data Analytics II <b>Session Chair</b> Dr. Chendriyee Chowdhury Jadavpur University, Kolkata, India  Date: 24/02/2022 Time: 02:30PM - 05:00PM Organized by Institute of Engineering & Management Group Kolkata, India <b>IEMIS 2022</b> Technical Session 4.2 Advance Computing II <b>Session Chair</b> Dr. Debashis Senapati CHESST (Deemed to be University), India  Date: 24/02/2022 Time: 02:30PM - 05:00PM Posting URL: <a href="https://www.iem22.org/9944852006">https://www.iem22.org/9944852006</a> Posting ID: 9944852006 <b>IEMIS 2022</b> Date: 23rd - 25th February, 2022	<b>Technical Session 5.3</b> Pattern Recognition II <b>Session Chair</b> Dr. Geetika Chand Maharaja Surajmal Institute of Technology, Jankpur, New Delhi, India  Date: 24/02/2022 Time: 09:30AM - 11:30AM <b>IEMIS 2022</b> Technical Session 4.1 Computational Intelligence III <b>Session Chair</b> Dr. Debasish Dey Dibrugarh University, India  Date: 24/02/2022	<b>Technical Session 2.3</b> Computational Intelligence I <b>Session Chair</b> Dr. Gagandeep Kaur School of Law, University of Petroleum and Energy Studies, Dehradun, India  Date: 24/02/2022 Time: 3:00PM - 4:30PM Organized by Institute of Engineering & Management Group Kolkata, India <b>IEMIS 2022</b> Technical Session 6.2 Advance Computing II <b>Session Chair</b> Prof. Geeta Jain KCG College of Technology, Chennai, India  Date: 24/02/2022 Time: 02:30PM - 05:00PM Posting URL: <a href="https://www.iem22.org/9944852006">https://www.iem22.org/9944852006</a> Posting ID: 9944852006 <b>IEMIS 2022</b> Date: 23rd - 25th February, 2022
<b>Technical Session 2.2</b> Information Retrieval I <b>Session Chair</b> Prof. Ila Kaurshik KIET Group of Institutions, Ghaziabad, India  Date: 23/02/2022 Time: 3:00PM - 4:30PM <b>IEMIS 2022</b>	<b>Technical Session 5.1</b> Pattern Recognition IV <b>Session Chair</b> Dr. Ihtiram Raja Khan Jamia Hamdard, Delhi, India  Date: 25/02/2022 Time: 11:30AM - 2:00PM <b>IEMIS 2022</b>	<b>Technical Session 5.2</b> Information Retrieval IV <b>Session Chair</b> Dr. Basmah Hazela Amity University, Lucknow Campus, India  Date: 25/02/2022 Time: 11:30AM - 2:00PM <b>IEMIS 2022</b>
<b>Technical Session 1.4</b> Data Science and Data Analytics I <b>Session Chair</b> Dr. Anil Ghosal St. Thomas' College of Engineering & Technology, Kolkata, India  Date: 23/02/2022 Time: 12:00PM - 2:00PM <b>IEMIS 2022</b>	<b>Technical Session 1.5</b> Advance Computing I <b>Session Chair</b> Prof. Adesh Kumar Pandey KIET Group of Institutions, Delhi-NCR, Ghaziabad, India  Date: 23/02/2022 Time: 12:00PM - 2:00PM <b>IEMIS 2022</b>	<b>Technical Session 2.2</b> Data Science and Data Analytics II <b>Session Chair</b> Dr. Ashok Kumar Chitkara University Institute of Engineering & Technology, Chitkara University, Punjab, India  Date: 24/02/2022 Time: 09:30AM - 11:30AM <b>IEMIS 2022</b>
<b>Technical Session 5.1</b> Pattern Recognition IV <b>Session Chair</b> Dr. Ahmed J. Obaid Kufa university, Iraq  Date: 25/02/2022 Time: 11:30AM - 2:00PM <b>IEMIS 2022</b>	<b>Technical Session 1.3</b> Data Science and Advanced Analytics I <b>Session Chair</b> Dr. Aakanksha Shrivastava National Institute of Technology Raipur Chhattisgarh, India  Date: 23/02/2022 Time: 12:00PM - 2:00PM <b>IEMIS 2022</b>	<b>Technical Session 5.8</b> Pattern Recognition II <b>Session Chair</b> Dr. Amandeep Kaur Guru Tegh Bahadur Institute of Technology, Rajouri Garden, New Delhi, India  Date: 24/02/2022 Time: 09:30AM - 11:30AM <b>IEMIS 2022</b>
<b>Technical Session 2.1</b> Pattern Recognition I <b>Session Chair</b> Dr. Anubij Kumar Agarwal Chitkara University Institute of En- gineering and Technology, Chitkara University, Punjab, India  Date: 23/02/2022 Time: 3:00PM - 4:30PM <b>IEMIS 2022</b>	<b>Technical Session 3.1</b> Data Science and Advanced Analytics II <b>Session Chair</b> Dr. Anubij Kumar Agarwal Chitkara University Institute of Engineering and Technology, Chitkara University, Punjab, India  Date: 24/02/2022 Time: 09:30AM - 11:30AM <b>IEMIS 2022</b>	<b>Technical Session 5.4</b> Data Science and Data Analytics IV <b>Session Chair</b> Dr. Anupam Ghosh Netaji Subhash Engineering College, WB, India  Date: 25/02/2022 Time: 11:30AM - 03:00PM <b>IEMIS 2022</b>



## Session Chairs

<b>Technical Session 3.2</b> <b>Data Science and Data Analytics II</b> <b>Session Chair</b>  <b>Dr. Megha</b> School of Computing, DIT University Dehradun, Uttarakhand, India Date: 24/02/2022 Time: 09:30AM - 11:30AM	<b>Technical Session 2.2</b> <b>Information Retrieval I</b> <b>Session Chair</b>  <b>Prof. Nikhil Sharma</b> Delhi Technological University, Delhi, India Date: 23/02/2022 Time: 3:00PM - 4:30PM	<b>Technical Session 2.5</b> <b>Advance Computing II</b> <b>Session Chair</b>  <b>Prof. Jueli J. P. C. Rodrigues</b> Federal University of Piaui (UFPI), Brazil Date: 23/02/2022 Time: 12:00PM - 2:00PM
<b>Technical Session 1.4</b> <b>Data Science and Data Analytics I</b> <b>Session Chair</b>  <b>Prof. Manoj Kumar Sur</b> Future Institute of Engineering and Management Kolkata, India Date: 23/02/2022 Time: 12:00PM - 2:00PM	<b>Technical Session 1.5</b> <b>Advance Computing I</b> <b>Session Chair</b>  <b>Prof. Neelam Sharma</b> Maharaja Agrasen Institute of Technology (MAIT), GGSIPU, New Delhi, India Date: 23/02/2022 Time: 12:00PM - 2:00PM	<b>Technical Session 1.1</b> <b>Computational Intelligence I</b> <b>Session Chair</b>  <b>Prof(Dr.) Leena Ahuja</b> AIIT Amity University, India Date: 23/02/2022 Time: 12:00PM - 2:00PM
<b>Technical Session 3.3</b> <b>Pattern Recognition II</b> <b>Session Chair</b>  <b>Dr. Kavita Sheoran</b> Maharaja Surajmal Institute of Technology, Jorhapuri, New Delhi, India Date: 24/02/2022 Time: 09:30AM - 11:30AM	<b>Technical Session 1.3</b> <b>Advance Computing II</b> <b>Session Chair</b>  <b>Prof. Nitish Pathak</b> Bhagwan Parshuram Institute of Technology, Guru Gobind Singh Indraprastha Uni- versity, New Delhi, India Date: 23/02/2022 Time: 12:00PM - 2:00PM	<b>Technical Session 3.1</b> <b>Data Science and Advance Analytics II</b> <b>Session Chair</b>  <b>Prof.(Dr.) Namrata Dhandia</b> Amity University, Uttar Pradesh, India Date: 24/02/2022 Time: 09:30AM - 11:30AM

<b>Organized by Institute of Engineering &amp; Management Group</b> <b>Kolkata, India</b> <b>IEMIS 2022</b> <b>Technical Session 2.3</b> <b>Information Retrieval I</b> <b>Session Chair</b>  <b>Prof. Siddharth Gautam</b> Netaji Subhas University of Technology, Delhi India Date: 23/02/2022 Time: 12:00PM - 2:00PM Meeting Link: <a href="https://zoom.us/j/93949852066">https://zoom.us/j/93949852066</a> Meeting ID: 93949852066	<b>Organized by Institute of Engineering &amp; Management Group</b> <b>Kolkata, India</b> <b>IEMIS 2022</b> <b>Technical Session 2.2</b> <b>Data Science and Data Analytics II</b> <b>Session Chair</b>  <b>Dr. Sachin Nandan Mahanty</b> College of Engineering Pune, Pune, India Date: 24/02/2022 Time: 09:30AM - 11:30AM Meeting Link: <a href="https://zoom.us/j/93949852066">https://zoom.us/j/93949852066</a> Meeting ID: 93949852066	<b>Organized by Institute of Engineering &amp; Management Group</b> <b>Kolkata, India</b> <b>IEMIS 2022</b> <b>Technical Session 2.1</b> <b>Pattern Recognition I</b> <b>Session Chair</b>  <b>Dr. Raj Gaurang Tiwari</b> Chitkara University Institute of En- gineering and Technology, Chitkara University, Punjab, India Date: 23/02/2022 Time: 3:00PM - 4:30PM Meeting Link: <a href="https://zoom.us/j/98954345372">https://zoom.us/j/98954345372</a> Meeting ID: 98954345372
<b>IEM</b> Date: 23rd - 25th February, 2022 <b>Organized by Institute of Engineering &amp; Management Group</b> <b>Kolkata, India</b> <b>IEMIS 2022</b> <b>Technical Session 2.2</b> <b>Information Retrieval I</b> <b>Session Chair</b>  <b>Prof. Shaheer Abidin</b> Aligarh Muslim University, U.P., India Date: 23/02/2022 Time: 3:00PM - 4:30PM Meeting Link: <a href="https://zoom.us/j/93949852066">https://zoom.us/j/93949852066</a> Meeting ID: 93949852066	<b>IEM</b> Date: 23rd - 25th February, 2022 <b>Organized by Institute of Engineering &amp; Management Group</b> <b>Kolkata, India</b> <b>IEMIS 2022</b> <b>Technical Session 2.2</b> <b>Information Retrieval I</b> <b>Session Chair</b>  <b>Dr. Poonam Rani</b> NSUT, Govt. of NCT of Delhi, India Date: 23/02/2022 Time: 3:00PM - 4:30PM Meeting Link: <a href="https://zoom.us/j/93949852066">https://zoom.us/j/93949852066</a> Meeting ID: 93949852066	<b>IEM</b> Date: 23rd - 25th February, 2022 <b>Organized by Institute of Engineering &amp; Management Group</b> <b>Kolkata, India</b> <b>IEMIS 2022</b> <b>Technical Session 3.4</b> <b>Information Retrieval II</b> <b>Session Chair</b>  <b>Dr. Piyush Kumar Pareek</b> Nitze Meerakshi Institute of Technology, Bengaluru India Date: 24/02/2022 Time: 09:30AM - 11:30AM Meeting Link: <a href="https://zoom.us/j/95322962258">https://zoom.us/j/95322962258</a> Meeting ID: 95322962258

## Session Chairs

<p>Organized by Institute of Engineering &amp; Management Group Kolkata, India</p> <p><b>IEMIS 2022</b></p> <p><b>Technical Session 4.4</b> Data Science and Data Analytics III</p> <p><b>Session Chair</b></p> <p><b>Dr. Suparna Biswas</b> Maulana Abul Kalam Azad University of Technology, Nadia, WB, India</p>  <p>Date: 24/02/2022 Time: 02:30PM - 05:00PM</p> <p>Meeting Link: <a href="https://zoom.us/j/98641315148">https://zoom.us/j/98641315148</a> Meeting ID: 98641315148</p>	<p>Organized by Institute of Engineering &amp; Management Group Kolkata, India</p> <p><b>IEMIS 2022</b></p> <p><b>Technical Session 2.1</b> Pattern Recognition I</p> <p><b>Session Chair</b></p> <p><b>Dr. Vikas Khuller</b> Chitkara University Institute of En- gineering and Technology, Chitkara University, Punjab, India</p>  <p>Date: 23/02/2022 Time: 3:00PM - 4:30PM</p> <p>Meeting Link: <a href="https://zoom.us/j/98954345372">https://zoom.us/j/98954345372</a> Meeting ID: 98954345372</p>	<p>Organized by Institute of Engineering &amp; Management Group Kolkata, India</p> <p><b>IEMIS 2022</b></p> <p><b>Technical Session 2.1</b> Computational Intelligence II</p> <p><b>Session Chair</b></p> <p><b>Dr. Vinod Kumar Shukla</b> Amity University, Dubai, UAE</p>  <p>Date: 24/02/2022 Time: 3:00PM - 4:30PM</p> <p>Meeting Link: <a href="https://zoom.us/j/98641315148">https://zoom.us/j/98641315148</a> Meeting ID: 98641315148</p>
<p><b>IEM</b> Date: 23rd - 25th February, 2022</p> <p>Organized by Institute of Engineering &amp; Management Group Kolkata, India</p> <p><b>IEMIS 2022</b></p> <p><b>Technical Session 4.3</b> Data Science and Advanced Analytics II</p> <p><b>Session Chair</b></p> <p><b>Dr. Soumen Kumar Pati</b> Maulana Abul Kalam Azad University of Technology, Nadia, WB, India</p>  <p>Date: 24/02/2022 Time: 02:30PM - 05:00PM</p> <p>Meeting Link: <a href="https://zoom.us/j/98641315148">https://zoom.us/j/98641315148</a> Meeting ID: 98641315148</p>	<p><b>IEM</b> Date: 23rd - 25th February, 2022</p> <p>Organized by Institute of Engineering &amp; Management Group Kolkata, India</p> <p><b>IEMIS 2022</b></p> <p><b>Technical Session 1.2</b> Advance Computing I</p> <p><b>Session Chair</b></p> <p><b>Prof. Vikash Yadav</b> Department of Technical Education, Uttar Pradesh, India</p>  <p>Date: 23/02/2022 Time: 12:00PM - 2:00PM</p> <p>Meeting Link: <a href="https://zoom.us/j/93949852066">https://zoom.us/j/93949852066</a> Meeting ID: 93949852066</p>	<p><b>IEM</b> Date: 23rd - 25th February, 2022</p> <p>Organized by Institute of Engineering &amp; Management Group Kolkata, India</p> <p><b>IEMIS 2022</b></p> <p><b>Technical Session 5.3</b> Computational Intelligence IV</p> <p><b>Session Chair</b></p> <p><b>Dr. Tushar H Jaware</b> R. C. Patel Institute of Technology, Shirpur, India</p>  <p>Date: 25/02/2022 Time: 11:30AM - 02:00PM</p> <p>Meeting Link: <a href="https://zoom.us/j/98641315148">https://zoom.us/j/98641315148</a> Meeting ID: 98641315148</p>



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## From the Desk of Editors

In recent times, highly incremental nature of real time data opens up several opportunities for the industries and academia to meet numerous challenges. Thus, the data are processed to extract valuable information which method includes analyzing and restructuring of data in order to maintain effective decision-making. To discover useful knowledge from the huge source of data intelligent data analysis techniques are required. While “Data Mining” evolves with innovative learning algorithms and knowledge discovery techniques, Computational Intelligence combines the results of data mining for becoming more intelligent than ever. To secure all these significant information highly secure mechanisms are required which is served by another challenging research area “Information Security”.

IEMIS is an international platform for the researchers from industries and academia to represent they're of research and development in the fields of Data Mining & Information Security. After a through double blind peer review process by experienced subject expert reviewers chosen from the country and abroad, editors have finally selected 30% papers. The proceedings of IEMIS are a collection of papers enjoyed significantly working in operation with the International Advisory, Program and Technical Committee to call for papers, review papers and finalize papers to be included in the proceedings.

This International Conference IEMIS aims at surrounding new breed of engineers, technologist making it a crest of global victory. All the papers are focused on the thematic areas of the conference and respective authors have provided many opportunities for presentation. The proceeding of IEMIS is to be released to mark this great day of IEMIS more exceptional. We hope the author's own research and opinions add value to it. First and foremost are the authors of papers, columns and editorials whose works have made the conference a great success. We had an immense pleasure to put together this proceeding. The conference and proceedings are a credit to a large group of people and everyone should be thanked for the outcome. We extend our deep sense of gratitude to all those for their warm encouragement, encouragement and continuous support for making it possible.

Hope all of us will appreciate the good assistance made and justify our efforts IEMIS



# **Abstracts of Contributed Papers**



## Smart Spy in the online video calls without notifying the concerned and alerting the nearest receiver contacts

N.Ravinder<sup>\*1</sup>, Dr.S.Hrushikesava Raju<sup>2</sup>, B.Venkateswarlu<sup>3</sup>, Dr.Durga Bhavani Dasari<sup>4</sup>, B.Revathi<sup>5</sup>, Harika Lakshmi Sikhakolli<sup>6</sup>

<sup>1,2,3,4,5,6</sup>Department of Computer Science and Engineering, Koneru Lakshmaiah Education Foundation, Green Fields, Vaddeswaram, Guntur - 522502

**Abstract.** Now-a-days, video calls are used by everywhere and it became more essential service. In the video calling, the receivers suppose not able to lift the call due to many constraints. The sender may get vex with this kind of unresponsive possessed by the receiver. There are dangerous scenarios when the receiver is in danger or critical stage not able to communicate. The sender might want to know what the receiver is doing although the video call is ringing the receiver won't attempt it. This curiosity leads to develop a novel feature called hidden activation of the camera without notifying the receiver during the video call ringing but the receiver has to enable the spy feature. This feature may also help when the important person is kidnapped and trapped by some violent gang. The feature might show the things that are in front of the camera as well as the backside of it although the receiver mobile is switched off but having reserved battery power. This feature will recognize the scenes that are related to the danger zone clip or the normal clip. If the clip is a suspected zone, it automatically alerts the police near the location of the receiver. If not, the sender will be notified the receiver is busy. The proposed feature aims to know the environment of the receiver. This will benefit society a lot in the issues of the contemporary environment. The results will guide the necessity of this feature and its performance. There are apps to track the victim by the police control room by dialing before entering into the dangerous location but the user can't know odd things to have happened in advance, that time alerts the family contacts as well as close friends contacts.

## Majority biased detection of Malicious Websites

Arghasree Banerjee<sup>1</sup>[0000-0002-3982-4520], Kushankur Ghosh<sup>2</sup>[0000-0002-4761-120X], Rahul Sen<sup>1</sup>, Aritro Chakraborty<sup>3</sup>, Sudipta Roy Chowdhury<sup>3</sup>, and Sankhadeep Chatterjee<sup>3</sup>[0000-0002-3930-4699]

<sup>1</sup> University of Engineering & Management, Kolkata, India

<sup>2</sup> Department of Computing Science, University of Alberta, Edmonton, Canada

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**Abstract.** Considering the fatality of malicious websites, the current literature supports the application of Machine Learning based architectures to perform automatic classification of websites. Irregular distribution of the data often results in a majority biased classification and eventually decreases a model's classification performance. In this paper, we addressed the problem in detecting malicious websites by employing Tomek Link based resampling techniques to avoid the sampling of noisy examples. The experiment is conducted with 3 popular classification techniques and compared with different oversampling and under-sampling frameworks. The fatal effect of the irregular class distribution in malicious website detection is further experimentally justified with the increasing level of irregularity.

## A Review on Analysis and Development of Quantum Image Steganography Technique for Data Hiding

Sonia Thind<sup>1</sup> and Dr. Anand Kumar Shukla<sup>2</sup>

<sup>1</sup> Research Scholar, University Institute of Computing,  
Chandigarh University, Gharuan, Mohali, India.  
(Email id: sonia.thind24@gmail.com)

<sup>2</sup> Associate Professor, University Institute of Computing,  
Chandigarh University, Gharuan, Mohali, India.  
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**Abstract.** Data security is very important aspect of security to protect the information from being tampered and unauthorized use. Data can be protected in both ways whether data is placed at one place or during transmission of information. There are two ways to protect the data, i.e. Cryptography and Quantum Steganography. For the security and privacy of sensitive information on the internet, current information security techniques basically depend on the classical cryptography techniques. Recent advancements in Quantum Steganography methods challenge the classical cryptographic systems. In Quantum Steganography technique media or characters are hidden in other Medias like image in other image, text in an image, sound in image, image in a video etc. This paper give a review of many research papers which presents how secure communication can be achieved by using quantum image steganography technique for data hiding, by highlighting objective, methodology, analysis, findings and limitations of the papers on that area.

## Block-based Discrete Cosine Approaches for Removal of JPEG Compression Artifacts

Amanpreet Kaur Sandhu

Associate Professor, University Institute of Computing, Chandigarh University, Mohali, Punjab

**Abstract.** Image compression plays an important role in different fields, such as medical imaging, digital photography, multimedia, interactive Television, mobile communications etc. The main function of image compression is to reduce the size of image, transmission cost and also occupy less storage space. It maintains the perceptual quality of an image without ant loss of important information. Therefore, space and time are two main components of image compression. Moreover, Image compression is a successful and popular technique which reduce the size of image and display a tangible information of given data. Lossless, lossy and hybrid compression are the different types of techniques which used to reduce the size of images and videos. In this paper, advantages and efficiency of image compression have been discussed. There are two types of blocking artifacts filters that are discussed along with types of blocking artifacts.

## An Interpretive Saga of SQL Injection Attacks

Saloni Manhas

University Institute of Computing, Chandigarh University, Mohali, India  
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**Abstract.** Web applications security is indeed the most talked about and a vital topic of discussion in cyber security world. In the recent years, websites have become a main target for hackers. Attackers exploit vulnerabilities present in the web applications. Application level attacks are increasing day by day in websites. Some of the main application level attacks are SQL injections, Cross Site Scripting attacks, Cookie poisoning attack, Command Injection Attack etc. According to OWASP, Injection attacks occupy first place in breaching website security. There are several Government, Private and E-Commerce websites that become victim of SQL injection attack each year. This paper includes the detailed study of mitigation strategies proposed by various researchers related to SQL injection attack. Furthermore, defence mechanism to safeguard web applications from SQLi attacks and future research directions are also indicated.

## Scope of Machine Learning in Mobile Wireless Sensor Networks

Kavita Gupta<sup>1,a</sup>, Sandhya Bansal<sup>2,b</sup>, Ajay Khurana<sup>3,c</sup>

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**Abstract.** This work highlights the scope Machine Learning approaches in Mobile Wireless Sensor Networks. As Mobile Wireless Sensor Network faces numerous challenges in terms of energy conservation, data collection & aggregation, fault tolerance, QoS. Sink Mobility etc. Machine Learning is the branch of Artificial Intelligence used to analyze data for making predictions, so as to get the optimized results. Here, work shows how the machine learning approaches can be used in sensor networks to improve network performance by extending lifetime, data collection and aggregation, handling mobility of sink node, QOS, fault tolerance etc.

## An Exploratory Study on Internet of Things for Covid-19 Pandemic

Rydhm Beri <sup>1</sup>[0000-0002-1744-8173] and Raju Kumar <sup>2</sup>[0000-0002-2665-965]

University Institute of Computing, Chandigarh University, Mohali

rydhmberi@gmail.com<sup>1</sup>, rajuk12@gmail.com<sup>2</sup>

**Abstract.** Internet of Things (IoT) has gained popularity since last recent years and applied in wide variety of applications including education, homes, offices and healthcare industry. IoT field changing the healthcare system by considering factors like economy, technology and social by which patients can be diagnose, treat or monitored in effective way. The world is facing current global challenge which can severe the respiratory syndrome Covid-19 which leads to serious health issues and even huge mortality. There are more than 31cr. of people around the world suffering from Covid-19 with more than 5cr. of mortality, when this paper was written. Since the pandemic started, several researchers put their efforts to use technologies to save world from effects of this virus. IoT plays a major role during this pandemic. IoT-enabled devices or applications helps to reduce the chances of virus spread of Covid-19 by early diagnose, monitoring of patients during active or recovery phase. This paper discusses the role of IoT during Covid-19 and how IoT implementation in healthcare helps in the phases of diagnosis, isolation and recovery.

## A study of e-commerce platform issues shared by developers on Stack Overflow

Yusuf Sulistyo Nugroho\*, Syful Islam\*, Dedi Gunawan, Yogie Indra Kurniawan,  
Md. Javed Hossain, and Mohammed Humayun Kabir

**Abstract.** Developing an e-commerce platform is not a trivial task specifically when the development team will build it from the scratch. The team members need to discuss and find solutions of various issues during the development process. However, the e-commerce platform-related problems communicated by the developers have not been analyzed. To understand the challenges of the e-commerce developers shared in Stack Overflow, this study explores 17 e-commerce platforms to determine whether their features correlate with developers' experiences. The analysis on the question posts in Stack Overflow shows that developers discussed 17 e-commerce website development related issues that can be narrowed down into 5 major themes (i.e., database management, payment options, sales features, website design features, and website errors). The results also indicate that the technology stack of e-commerce platforms correlates to the development and maintenance experience of an online store by developers.

## An Overview of Cyber-Crimes and its Impact: Indian Scenario

Ashvarya Chaudhary  
Assistant Professor, University Institute of Computing,  
Chandigarh University, Punjab

**Abstract.** The phenomenal rise in the field of communication and the digital world has resulted in possible issues in the domain of cyber law and its ramifications. Nothing comes without a price and disadvantages. Though it makes people's lives easier by allowing them to do a variety of tasks with a single click of a button, it has also created new obstacles. Everything, including business, industries, government operations, and so on, comes to a halt without technology, particularly computers. Our economy and government, as well as various sorts of businesses, rely on computers for the efficient operation of their businesses and economic advancement, while criminals are actively involved in various types of cybercrime. As a result, the current study discusses a comprehensive knowledge and overview of cybercrime, particularly computer-related cybercrime, and its effects on numerous fields.

## Numerical Simulation of Boundary Layer Flow of MHD influenced Nanofluid over an Exponentially Elongating sheet

Debasish Dey and Rupjyoti Borah

**Abstract.** The present problem investigates the nature of simultaneous effects of thermal and mass diffusions on the MHD influenced nanofluid stream through absorbent region. The absorbent region is characterized by an exponentially stretching sheet. Similarity transformation has been used in the methodology to change the nature of differential equations. Due to the complexity introduced by non-linearity of these coupled equations, the analytical approach does not hold suitably. Therefore, the “4<sup>th</sup> order Runge Kutta Shooting technique” is utilized to solve these equations by developing programming code in MATLAB. Influences of various flow parameters on the motion with thermal and mass diffusions are discussed through graphs. Also, the numerical values of physical quantities are discussed in tabular form.

## Machine Learning Methods to identify Aggressive Behavior in Social Media

Varsha Pawar<sup>1</sup>, Deepa V Jose<sup>2</sup>

<sup>1</sup>Assistant Professor, Department of Computer Applications, CMR Institute of Technology, Bengaluru  
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<sup>2</sup>Associate Professor, Christ University, Bangalore  
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**Abstract.** With the more usage of internet and online social media, Platforms creep with lot of cyber crimes. Texts in the online platforms and chat rooms are aggressive. In few instances, people target and humiliate them with the text. It affects victim mental health. Therefore there is a need of detecting the abuse words in the text. In this paper a study of machine learning methods are done to identify the aggressive behavior. Accuracy can be improved by incorporating additional features.



## ODNN-LDA: Automated Lung Cancer Detection on CT Images Using an Optimal Deep Linear Discriminate Learning Model

Alaa Omar Khadidos

**Abstract.** Lung cancer is classified as one of the most common forms of cancer that cannot be ignored and can lead to death if treated late. According to the American Cancer Society, CT scans can currently diagnose lung cancer in its earliest stages. However, there are various occasions in which the doctors' experience diagnosing lung cancer can cause some complications. Human survival rates can be improved by early identification. The average survival rate for persons with lung cancer increases from 14 to 49 percent if the disease is detected early. CT is significantly superior to X-ray in terms of accuracy, but a complete diagnosis needs numerous imaging modalities that work together to support one another. There is much evidence that deep learning is a popular and effective tool for medical imaging diagnosis. This paper proposes a new method of automatic diagnosis classification that has been developed for the scanned CT images of the lungs. A implementation of the Optimal Deep Neural Network (ODNN) in addition to the Linear Discriminate Analysis (LDA) was used in this work to analyzed lung images obtained by CT scan. Malignant or benign lung nodules can be classified by obtaining in-depth features from the CT images of lungs and the redundancy of the dimensionality of the feature with Linear Dimensionality Reduction (LDR). The proposed method uses the Modified Gravitational Search Algorithm (MGSA) to shows an improvement of the ODNN's classification of lung cancer. In terms of sensitivity, specificity, and accuracy, the proposed classifier scored 96.2 percent, 85.37%, and 93.33 percent, respectively.

## A Comprehensive Study on Robots in Health & Social Care

Adil Khadidos

**Abstract.** The world have experienced a severe human-health crisis as a result of the emergence of a novel coronavirus (COVID-19), which was declared a global pandemic by WHO. As close human-to-human contact can spread the COVID-19 causing virus, keeping social distance is now an absolute necessity as a preventative measure. At a time of global pandemic, there is a huge need to treat patients with little patient-doctor interaction by using robots. Robots can be characterized as machines that can execute a wide range of tasks with greater autonomy and degree of freedom (DoF) than humans, making it difficult to identify them from other machines. A wide range of equipment, sensors, and ICT (information and communication technology) are now part of the healthcare system, which has become increasingly complicated. Protecting front-line personnel from virus exposure is the primary goal of using robots in health care. The aim of this study is to emphasize the evolving importance of robotics applications in healthcare and related fields. This paper examines in depth the design and operation of a wide range of healthcare robots in use around the world.

## Assistive Technology for Pedagogical Support and Application of Data Analysis in Neurodevelopmental Disability

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**Abstract.** Educational Data Mining (EDM) has been adapted in a variety of higher educational contexts. It can also play a significant role in the domain of special education of autism spectrum disorder (ASD) which is the third most common life-long neuro-developmental disorder. Once in special school, children with ASD need

user-friendly instructions & teaching equipment. A social & cultural appropriate educational intervention application may ease the process of learning. It may help to monitor the progress, to identify the learning pattern & also to offer parental training. Moreover, machine learning models may be explored to diagnose the presence of autism in a child. Also, educators may be supported with educational assessment tool in form of mobile application to measure the performance parameters and thereby to observe and/or evaluate the learning progress of the child accurately and time efficiently. Computer assisted pedagogical support may be finely tailored to serve children as well as educators across the disability spectrum in special education setup. In this paper, the authors aim to review the major existing research works carried in this field of EDM at international and national level. They also have proposed and implemented an integrated autism management platform and presents a brief overview of their ongoing project work.

## **Integrated health care delivery and Tele-Medicine: Existing legal impediments in India**

Dr. Meera Mathew

**Abstract.** The technological innovation in the healthcare sector has contributed to the growth of telemedicine in India. “Health services” fall under State responsibility as per the Indian Constitution by virtue of Schedule 7 - although policy and planning framework are under the scope of Central government. Telemedicine cannot not work as an autonomous service, rather, ought to be subjected to different regulations having complex ethical, medico-legal manifestations. As far as India is concerned, Ministry of Health and Family Welfare of India (MoHFW) is the body responsible for initiating the policy of digitization of healthcare. However the point is - how far digital health services going appropriately in India. Based on NDHB’s comprehensive architectural framework of “Federated National Health Information System” in January 2020 and as the pandemic strategy Medical Council of India and the NITI Aayog released new guidelines on telemedicine with respect to registered medical practitioners, this research needed to be checked. Thus, the examination was done in these aspects. Guidelines were revisited to see how the hospitals in Delhi and NOIDA function based on the records submitted in medical consultation given to patients using telemedicine. It is felt that telemedicine being a nebulous concept in India, it needs to be analyzed in the light of prospective opportunities it would offer. There is a need for collaborative approaches on digital health, revision in the prevailing legal and ethical frameworks, the clinical practices corresponding to standing medical guidelines. Also, it is found that there exist no uniform telemedicine practices balancing the privacy norms, medico-legal responsibility and regulatory standards. To arrive at conclusion, the best practices prevailed in other countries are examined and adopted. It is felt that, the policies existing in telemedicine need to be bifurcated as digital consultation, digital photography, remote patient monitoring (RPM) separately.

## **Wheat-head Detection from Outdoor Wheat Field Images using YOLOv5**

Samadur Khan and Ayatullah Faruk Mollah

**Abstract.** Automatic wheat head detection is an important problem having applications in wheat production estimation, wheat breeding, crop management, etc. Since the introduction of popular object detection model YOLO (You Only Look Once) in 2015, a number of advancements have come into picture. In this paper, YOLOv5, the latest of the YOLO family of models is deployed for automatic wheat head detection from outdoor wheat field images. Experimenting on a publicly available wheat head dataset, mean average precision of 92.5% is achieved, which reflects its capability in learning and prediction wheat heads. The present method also outperforms some other methods on the same dataset. YOLOv5, being open source may receive more commits in future paving the possibility of further improvement in wheat head detection performance.

## Forecasting the growth in COVID-19 infection rates

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**Abstract.** The recent times have seen the global rise in infection rates from the virus Covid-19, leading to a pandemic. The exponential rise in infections and deaths lead to panic and nation-wide lockdowns across the globe. Advancements in biotechnical and medical research has paved the way for the development and mass distribution of vaccines. To build an understanding of the current situation we did a comparative analysis of the rise in infection rates among citizens across the countries and also the growth in vaccinations in the pre-vaccination phase and the post-vaccination phase of the on-going pandemic to determine whether the rate of vaccination is more than the rate of infection or otherwise. Then, a comparison is done among two prediction models we built, one using polynomial regression and other using SVM to determine which model provides better prediction results of infection rates in a country.

## Driver Drowsiness Detection and Traffic Sign Recognition System

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**Abstract.** A humongous number of road accidents occur every year and a substantial amount of these cases are due to the drowsy condition of the driver. A driver's well-being on the road decides the fate of fellow passengers. A drowsy driver is indeed a great threat to many lives. A large population is directly or indirectly affected by these situations. In case of any mishap, these vehicles cause huge damage to both life and property. Driving drowsy is as dangerous as driving drunk. In both scenarios, the driver has no control over the vehicle. The best way to avoid such accidents caused by a driver's drowsy condition is to detect his/her drowsiness and warn him/her before he/she falls asleep. Being drowsy and skipping traffic signs due to drowsiness is a point of major concern for road accidents. To combat such hazardous situations, we have come up with an innovative idea in which we would get the complete analysis of the driver's condition and sleep pattern and alert him with a beep sound. This innovative yet useful project is called the Drowsiness Detection system. Firstly, the system preprocesses the image to focus on important information. Secondly, detection, binarization, and localization are implemented. Finally, classifications are made of the traffic signs which are detected based on deep learning. This document proposes a method of detection of drowsiness and recognition of traffic signs based on image processing, combined with the Convolution neural network (CNN). Being able to accurately and effectively identify road signs can improve driving safety. Traffic signs provide general and useful information on traffic rules, road conditions, and driving directions to road users whether they are passengers, drivers, or pedestrians. Neglect or skipping of traffic signs by drivers due to any reason is a threat to all road users and our project provides a solution to help drivers drive better and safer.

# Application of Data Visualization: Realization of Car Rental System

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**Abstract.** Travel suppliers largely depend on business travel as their main source of profit because it is fewer prices conscious compared to the pleasure travel market. The past recession has caused corporations to scale-down business related to travel drastically. Car rental companies are a major part of the travel industry. Car rental rates vary with economic ups and down. Nowadays, there are online car renting services which give much benefit to users in modern society. The manual car rental system supports service in stipulated time only. So, customers have inadequate time to make any transactions. With the help of the online car rental system, we can elongate our operational hours. In this paper, an attempt has been made to design an entire car rental analysis server using data visualization techniques.

# Prediction of Covid-19 Disease by ARIMA Model and Tuning Hyperparameter through GridSearchCV

Aisha Alsobhi

**Abstract.** The COVID-19 pandemic has significantly impacted the mental, physiological, and financial well-being of people around the globe. It has threatened lives and livelihoods, and triggered supply chain disruptions and economic crises. In every country, there are risks and long-term implications. Planners and decisionmakers could benefit from a forecasting model that anticipates the spread of this virus, thereby providing insight for a more targeted approach, advanced preparation, and drive better proactive collaboration. The signs and symptoms of a disease like COVID-19 are hard to define and predict, particularly during times of pandemic. Several epidemiological studies have been successful in identifying predictors, using artificial intelligence (AI). This paper explores various methodologies for tuning the hyper parameters of the Auto-Regressive Integrated Moving Average (ARIMA) model, using GridSearchCV, to predict and analyze the occurrence of COVID-19 in populations. In time series analysis, hyper-parameters are crucial and the GridSearchCV methodology results in greater predictive accuracy. The parameters proposed for the analysis of daily confirmed cases, recovered cases, and deceased cases in India were ARIMA (4,1,5), ARIMA (5,1,1), and ARIMA (5,1,1) respectively. The performance of the model with different configurations was evaluated using three measurements: Root Mean Square Error (RMSE), R2 Score, and Mean Absolute Error (MAE). These results were compared with a state-of-art method to assess model selection, fitting, and forecasting accuracy. The results indicated accuracy and continuous growth in the number of confirmed and deceased cases, while a decreasing trend was graphed for recovered cases. IN addition, the proposed ARIMA using a GridSearchCV model predicted more accurately than existing approaches.



## \Enhancement of Low Resolution Images using Deep Convolutional GAN

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**Abstract.** Neural networks have expanded the scope of machine learning to unlock new opportunities across industrial dimensions. Convolutional GAN is a recent technique which has achieved promising results in the areas of image enhancement and classification. In this paper, Deep Convolutional GAN (DCGAN) is implemented, and the network is trained on the fashion-mnist dataset. The implementation of DCGAN is done using Leaky ReLU activation functions and sequential modeling. The proposed implementation has resulted in successful data retrieval from grayscale images for relevant apparel categories. The collective PSNR and SSIM results achieved in this work are better, when compared with the other contemporary image enhancement techniques available in literature.

## EXOPLANET HUNTING USING MACHINE LEARNING

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**Abstract.** With the rapid expansion in the field of aeronautical engineering and its technology, the unseen and unknown area is now in our view and vision. The planets which are light years distant from our galaxy are now visible due to such advancement in the field of astronomy. In basic terms, Exoplanets may be defined as gigantic planets revolving around a star in an unknown possibly habitable galaxy. Due to the rise in temp of Earth, it becomes necessary to identify and gather information about another habitable planet. Such critical data is needed to be processed using machine learning and its models. Therefore, the models are trained and implemented from scratch to provide meaningful information from a humongous set of data. This paper illustrates the implementation and functioning of advanced algorithms to categorize whether the mass found is a planet or debris with the help of flux variation of the stars.

## Emerging trends in multimedia

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**Abstract.** The rapid development of the network and devices has made multimedia technology to spread across all the aspects of the people's life. Multimedia can be defined as the media which interactively spread the information, combining two or more media. Multimedia technology has impacted on our daily lives in various aspects like e-learning, virtual reality, journalism, Content Streaming and many more. The evolution of multimedia has been carried out in various phases over the last decade which has been further discussed under the topic Diversity in Multimedia. In this paper, we intend to explain about the various trends emerging in multimedia and the concerns related to the transmission of the user's personal data and their privacy. The already existing technologies which are not yet fully explored such as Virtual reality, Hologram, Advanced Journalism and feedback based content streaming and the security issues that arise with such advancement in technology has been talked about in depth in this paper.

## IoT in Medical Science

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**Abstract.** In a world dominated by medical science, the Internet of things(MIOT) plays a cardinal role in various aspects of the field of medical science where information security is a major area of concern for the industry. This paper summarizes the basic principle of Medical IOT (MIOT) and gives information in detail about the involvement and application of internet of things in the medical industry. The Internet of things in medical terms has a lot of specifications such as the memory size application, effective energy utilized and the capacity to process information to be taken care of which is discussed below. At last the paper mentions in detail about the various security protocols such as the radio frequency identification RFID, lightweight RFID mutual authentication (LRMI) protocol and a brief about the SecLap protocol which are used to establish an effective security system for transferring the information and maintaining an authenticated network between the tag and the reader. The paper also throws light on the architecture which plays a very important role in the enhancement of the existing IoT technology. Herein various layers of the system have been discussed which in totality helps in optimization of many medical related procedure and stabilize the growth of medical IOT.

## Technical Review and Data Analysis of Expert System Development

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**Abstract.** In this modern world, expert systems are one of the well-known research areas of artificial intelligence. Most of the expert systems are highly responsive, reliable, easily understandable, and high performance result oriented. This paper contains the design methodology, classification and development strategy of an expert system. Here we try to present some abstract analysis, structure of knowledge acquisition process with in the domain of expert system. We tried to review data analysis and express such kind of beneficial model that not only defend the innovative attributes of expert system but also described some of their constraint.

## A Spatio Demographic Analysis over Twitter Data using Artificial Neural Networks

Tawfiq Hasanin

**Abstract.** The demographic and population modeling methods has been under investigation trends since the 1980s. Extrapolation, prediction, and theoretical computational analysis of exogenous variables, are approaches to the forecasting of population processes. Such methods can be exploited to predict individual birth preferences or experts' views at the population level. Predicting demographic changes have been problematic while its precision usually depends on the case or pattern, numerous methods has been explored; however, so far there is no clear guidelines where the proper approach ought to be. Like certain fields of industry and policy, planning is focused on projections for the future composition of the population, the potential creation of population sizes and institutions is significant. In order to recognize potential social security issues as one determinant of overall macroeconomic growth, countries that have reduced mortality and low fertility, the case with some of the Asian

nations, desperately require accurate demographic estimates. This introduction provides a stochastic cohort model that uses stochastic fertility, migration, and mortality modeling approaches to forecast the population by gender, and literacy. This work focus on the population and literacy ratio of India as this nation holds the second largest population in the world. Our approach is based on Artificial Neural Network algorithm that can forecast the population literacy ratio and gender differences based on living States populations using social networks data. We concentrated primarily on quantifying future planning challenges as previous research appeared to neglect potential risks. Our model is then used to forecast/predict gender-wise population for each major state/city. The findings offer clear perspectives on the projected gender demographic composition and our model holds high precision results.

## An Insight on Latest Technologies of Cyber Security

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**Abstract.** Cyber security plays an important role in protecting the financial as well as personal data of an individual. In the time of internet availability, cyber-attack is the basic challenge to the user's privacy and security. Cyber-crimes occur due to human errors and online stealing of user's information, which can be avoided and protected by enabling the correct use of cyber security. It provides a way of securing internet information, electronic systems, servers, mobile devices and computers from malicious attacks. Hence, tools are required to provide security against cyber-attacks i.e. phishing, Trojan horse and malwares; to protect cyber information from unauthorized access and use. This review provides the information on latest techniques used in cyber security including merits, demerits, future challenges along with the detailed description about cyber-attacks. Further, it will help researchers to build up more proficient solutions for cyber security.

## Gesture Recognition System for Real-Time Interaction in Dynamic Environment

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**Abstract.** Hand gesture recognition provides a significant impact in the field of human-computer interaction. It introduces the information, tools, and systematic design techniques, by which accuracy and easy implementation of daily tasks can be achieved. Gesture recognition is the approach by which computers can detect hand gestures. Human-computer interaction provides appropriateness in feedback, effortless implementation, and timely completion of the goal. Computer vision plays an important role in extracting high levels of comprehension from electronic images and videos. It is applied to a hand gesture recognition system to provide input to the computer to manipulate virtual objects by simply moving hand parts which act as a command. Providing a low-cost infrastructure device that alters the need for keyboards and mouse in laptops and computers.

## Physical and Mental Health Problem's Technical Resolutions

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**Abstract.** Various apps are available in the market that offers the necessary assistance required regarding healthcare to the people. Although many people use these apps, their willingness to stick to them and find them trustworthy has a pretty poor response. There is an explanation for such low engagement on these apps even if they are so useful. The user experience and the reliability of the app matter the most for any app to succeed in this world of technology. This research will focus on analyzing user reviews of the available apps on such help and mental health facilities and it will uncover the strengths, weaknesses, and areas of improvement in the apps. The significance and the capabilities are being discussed as per the consumer reviews and comments that have helped improve the apps and bring new functionalities and features to the app.

## Self-driving Car using Machine Learning

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**Abstract.** In current years Self-driving cars have come to be most of the maximum actively mentioned and researched topics. By all definitions, those systems as a robot revolution, belong to the robotics discipline, in spite of the truth that humans normally assign them to a particular area of the car industry. Replicating the complicated assignment of human driving by autonomous systems poses limitless engineering challenges, concerning the broader discipline of robotics, along with surroundings perception, choice making and control. Here we discuss all the types of autonomous cars invented and their most important technology used in it. And most importantly we discuss Tesla technology and the way they develop self-driving cars with the help of machine learning and giving cameras a vision using open cv, deep learning etc. Also find how cameras are best in place of lidar in autonomous cars.

## Credit Risk Analysis Using EDA

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**Abstract.** Organizations or banks providing funds to support people monetarily, keeping assets in return till the amount is repaid to the company with interest encounter loss at many instances when the borrower or the client fails to repay the loan appearing to be a defaulter. Also, when the firm disapproves the loan of an applicant who is likely to repay the sum, the loss is again withstood by the firm. Therefore, to avoid this loss this research is performed deeply analysing the factors using Exploratory Data Analysis, affecting the trend of defaulters as well as non-defaulters, helping the firm recognize the defaulters and disapproving their request to borrow. The Exploratory Data Analysis is performed by visually performing Univariate, bivariate and multivariate analysis on almost all the aspects of the two credit history datasets. The patterns and learnings were noted based on the visual as well as statistical analysis to determine creditworthiness of a client.

## Progressive Web Apps (PWAs) - Alternate to Mobile & Web

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**Abstract.** With the advancement in technology in each counting second new solutions to new problems comes into the picture and PWA are one of them which came as an alternative to the current leading technologies like android & Web, combining features of both the technology and overcoming the shortcoming of both the technologies. Progressive Web Apps are web apps that are built using the Service Workers API which can work offline by intercepting HTTP requests and delivering cached responses. The concept of progress is an approach that takes advantage of the capabilities of the environment instead of having rigid requirements. PWA is built without requiring the installation of a native app & works seamlessly across various platforms. Many Android Web browsers support Service Workers, which is a standard component of the PWA landscape. This paper aims to analyze the current state of support for PWA features in Web Views and how it fits into the overall web experience.

## ENTROPY GENERATION ANALYSIS OF MHD FLUID FLOW OVER STRETCHING SURFACE WITH HEAT AND MASS TRANSFER

Debasish Dey and Madhurya Hazarika

**Abstract.** Entropy generation analysis of MHD fluid flow moves through a stretching surface with velocity slip and chemical reaction parameter has been studied. The irreversibility ratios due to heat transfer, fluid friction, and the action of heat and mass transfer at the stretching sheet's surface are calculated. A system of non-linear partial differential equations with boundary conditions are translated into ordinary differential equations. The Runge-Kutta-Fehlberg technique (RKF45) is used to solve the system of non-linear partial differential equations with appropriate boundary conditions using symbolic computer algebra software Maple 21. The impact of many physical parameters on entropy generation number is visually plotted, including magnetic parameter, velocity slip parameter, velocity ratio parameter, Prandtl number, chemical reaction parameter and heat generation/absorption parameter. Another distinguishing feature of this work is the determination of the ratios of irreversibilities to the total entropy generation number at the surface.

## Impacts on health frameworks of big data analytics: A Review

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**Abstract.** Due to its volume, varied complexity, and high dynamics of data sources in health organizations, the health industry has been affected and improved from the presence of Big Data. Though the usage of big data analytic methods, instruments, and digital platforms are applied in a variety of fields, they have promising research guidelines for medical organizations to implement and deliver new cases of use for potential health applications. As evidenced by pioneering research initiatives, the success of medical applications in big data is dependent solely on the architecture and on the deployment of related tools. New research has been undertaken to derive specific healthcare frameworks, providing diverse analytical data capabilities for handling data sources, from electronic records to medicinal images. We have presented several analytical avenues from a variety of stakeholders in the patient-centered healthcare system. About underlying data sources and the analysis capabilities and application areas, we also reviewed different Big Data Frameworks. Moreover, the involvement of Big Data instruments in the development of the health eco-system is also presented.



## A Stacking Ensemble Framework for Android Malware Prediction

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**Abstract.** Every Android application needs the collection of permissions during installation time, and these can be used in permission-based malware detection. Different ensemble strategies for categorising Android malware have recently received much more attention than traditional methodologies. In this paper, classification performance of one of the primary ensemble approach (Stacking) in R libraries in context of for Android malware is proposed. The presented technique reserves both the desirable qualities of an ensemble technique, diversity and accuracy. The proposed technique produced significantly better results in terms of categorization accuracy.

## A comparative analysis of performances of different ensemble approaches for classification of Android Malwares

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**Abstract.** All Android apps require the accumulation of permissions during installation, and these are considered features that can be used in permission-based malware detection. Different ensemble strategies for categorization of Android malware have recently gotten a lot more attention in comparison to traditional methodologies. In this work, comparative analysis of performances of different ensemble approaches (Boosting, Bagging and Stacking) in R libraries for classification of Android Malwares is projected. Both the desirable qualities of an ensemble technique, accuracy and diversity, are preserved by the presented methods. In terms of categorization accuracy, the proposed techniques have produced significantly superior results.

## OPTICAL CHARACTER READER

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**Abstract.** We present an instance of the available OCR tools and teach the Tesseract tool in English which is transcribed in Latin male or female. OCR accessibility for the blind is a splendid development, where customers can experiment with books, magazines, plugins, or other programs. it can also be mixed with sound utilities, or sound synthesizers, which read textual content optically recognized by the software. OCR additionally has its own boundaries. this can no longer understand complicated text, mathematical variables, handwriting scripts.

The upscale OCR utility is used inside the vicinity needed, but it comes with additional computing fees. This paper targets to offer the OCR software that recognizes text characters, using the device getting to know model.

## Chaos-based Image Encryption with Salp Swarm Key Optimization

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**Abstract.** Substantial data is being transferred across the unsecured channel; with this considerable data transfer comes the need to protect this data. Thus, to achieve security during transmission, several encryption algorithms have been proposed. Chaos-based maps are widely employed for multimedia encryption due to their characteristics, like pseudo-randomness sensitivity to initial conditions. Inspired by researchers, we proposed an image security algorithm based on a chaotic tent map integrated with the Salp Swarm Algorithm (SSA) for key generation and optimization, for grayscale images. A diffusion and permutation are carried out in each round to make it secure. A simple XOR function is applied to encrypt and decrypt the data. Different statistical analysis has been applied to images, and results have been discussed to justify proposed techniques effectiveness.

## Role of IOT in Automated Hydroponic System: A Review

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**Abstract.** Many components are assumed for the growth of country economy. Agriculture is the major component for the growth of economy. The increasing demand for food, regarding quantity and quality, has raised the requirement for intensification of agriculture sector. Traditional methods use the soil for the growth of crop. It is an expensive process to prone the diseases. With the act of modern farming techniques, plants can be developed without the need of soil by utilizing nutrient solution. For this Hydroponics and Aeroponic can be used. Using IOT, smart hydroponic farming is implemented. IOT allows interaction of machines and controlling the hydroponic system without human interaction. Such systems are not harmful for environment as well as for the crops quality. IOT provide the innovative way for the modernization of agriculture. This paper provides an overview about the various types of hydroponic system, role of IOT in it and its application.

## AI-Based Real-Time Surveillance

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**Abstract.** Automatically describing the content material of an image can be an essential hassle in artificial intelligence that connects PC imagination and prescient and tongue processing, the problem will increase whilst we attempt to apprehend faces, gadgets and try and have a look at facial feelings with it or indifferent phrases whilst we attempt to generate the records we observe whilst we see something or a person. The idea of this venture after the desired amendment can permit one to maintain tune of suspicious or undesirable activities if passed off without continuously tracking them or without looking at the entire collection to be expecting the wrongdoer because it works in real-time. Also, it could be cross-checked if required because it stores the records that are secure from any leakage as its miles are encrypted and password protected.

## Natural Language Processing In Chat-Bots

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**Abstract.** Natural language processing (NLP) was utilized to include for the most part mysterious corpora, with the objective of improving phonetic examination and was hence improbable to raise ethical concerns. As NLP gets to be progressively wide-spread and uses more information from social media. The main goal is to develop a fully useful voice-based mechanization framework for the home that uses the “Internet of Things, artificial intelligence, and natural language processing” (NLP) to provide an inexpensive and efficient way to connect to home appliances for work. Chatbots could be virtual individuals who can successfully make conversation with any human being utilizing intuitively literary abilities. As of now, there are numerous cloud base Chatbots administrations that are accessible for the advancement and change of the chatbot segment such as “IBM Watson, Microsoft bot, AWS Lambda, Heroku” and many others. We displayed useful engineering that we propose to construct a brilliant chatbot for wellbeing care help. Our paper provides an outline of cloud-based chatbots advances together with the programming of chatbots and the challenges of programming within the current and upcoming Period of chatbots.

## CT Image Denoising Using Bilateral Filter And Method Noise Thresholding In Shearlet Domain

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**Abstract.** Computed Tomography (CT) proves to be one of the important apparatuses to diagnose disease in clinical science. The X-beam intensity decides the nature of C.T. images, if the X-beam portion is higher, the

nature of CT picture is improved yet it might create bad effect on the patients. Low portion CT pictures are noisy because of some significant reasons, for example, measurable vulnerability in all physical estimations. The major problem arises that if we lower the C.T. dose the quality of our image deteriorate and if we increase the dosage the risk on the patient increases. Thus in this paper, a technique is proposed in which Bilateral Filter and Shearlet based thresholding are used. For better edge safeguarding we have used the concept of method noise thresholding. From different output metrics such as PSNR, IQI, the accuracy of the resulting CT images is checked and evaluated. The findings are also contrasted with the related state of the art and some recent works as well. After review of the findings, it is noted that our proposed algorithm is better compared to existing algorithms.

## A COVID-19 Infection Rate Detection Technique using Bayes Probability

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**Abstract.** The main objective of this paper is to detect the infection rate of the SARS-Cov-2 virus amongst patients who are suffering from COVID with different symptoms. In this work, some data inputs from the intended patients (like contact with any COVID infected person, any COVID patient within 1KM, etc.) are collected in the form of a questionnaire and then applied Naïve Bayes probabilistic technique to evaluate the probability of how much that patient is affected in this deadly virus. Following this process, we collect sample data of 80 patients and apply the proposed analysis process using the C programming language. This approach also shows the comparison for different test cases with respect to the feedbacks of actual patient data analysis.

## Smart Car with Safety Features and Accident Detection Alert System

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**Abstract.** Technologically the automobile sector is rising fast and the road vehicles on road is stepping up everyday. On other hand, the safety of vehicles and riders also matters. We must ensure adequate safety in each vehicle. Our paper aims to provide safety features to a vehicle with real-time location access of the vehicle. Our prototype will consist of features like an accident detection and alert system, drunk driver alert, passenger safety button, and automatic airbag triggering. Various types of modules and sensors has intermixed with Arduino Hardware for making this prototype, such as, accelerometer (ADXL335) sensor to identify accidents, SW420 impact sensor to detect vibration in cars and activate the accident prevention system of the car, MQ3 alcohol sensor to detect whether the driver is drunk or not, GPS & GSM modules to locate car's location and to send an alert notification/message to it's nearest authority.

# Face Recognition Techniques and Implementation

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**Abstract.** Human face is multidimensional structure that conveys expression. Face recognition is one of the most essential techniques used these days for security purposes. Face recognition is capable of detecting human face. Face Recognition has been a great tool used in various real-life scenarios like security systems, social networking platforms & numerous commercial areas. As compared to traditional ML algorithms, deep learning techniques have improved the performance & accuracy of image processing such as contrast adjustment, histogram, image blending. Face recognition is a method of perceiving the face of a person based on distinctive features. In this era of artificial intelligence, face recognition is one of the most popular amongst other biometric techniques. Other biometric techniques may fail due to some reason but human face recognition will be the same and work properly. Different approaches like Statistical approaches, Principal component Analysis, Local binary pattern, hybrid approaches, Convolutional Neural Network & Support Vector machine are used to perform this task of face recognition. Finally, it is implemented using Matlab based on Eigen vectors. Face recognition is one of the most essential techniques used these days for security purposes Face Recognition has been a great tool used in various real-life scenarios like security systems, social networking platforms & numerous commercial areas. As compared to traditional ML algorithms, deep learning techniques have improved the performance & accuracy of image processing. Face recognition is a method of perceiving the face of a person based on distinctive features. In this era of artificial intelligence, face recognition is one of the most popular amongst other biometric techniques. Various approaches are used to do this task like Statistical approaches, Principal component Analysis, Local binary pattern, hybrid approaches, Convolutional Neural Network & Support Vector machine. Finally, it is implemented using Matlab based on Eigen vectors.

## Upgrading Search Link Priority by Content Analysis

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**Abstract.** As all of the valuable information related to different domains are available in the form of Hypertext in different web resources. Search engine provides a medium to retrieve this information according to the need of the user. There are various search engines available such as Google search engine, Alta, Vista, Yahoo Search Engine etc., which provides an interface an interface to access the web resources listing the search result according to the most relevant of the user query is an issue. In this chapter a new technique is suggested which take the search result of Google search engine and tried to rearrange the search results in increasing order according to the relevancy with the search query. Normalized term frequency of the keywords lying in the particular web documents is used to calculate the rank of a web page.



## A Python Based Virtual AI Assistant

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**Abstract.** Artificial Intelligence is a core specialization of making smart machines, especially computer programs. It relates to the familiar task of using computers to understand human intelligence. AI is broadly classified to study computations that permit perception, reason, and action. This paper gives an overview idea of a python-based personal assistant for Windows-based systems. This paper got its motivation from popular AI assistants like Windows's Cortana, Siri of iOS, Amazon's Alexa, and Google Assistant of Google. It is designed in a good user-friendly interface to execute various types of tasks by just saying certain set of instructions. As an AI personal assistant, this paper focuses mainly upon the assistance of the users with their daily activities like asking questions on Google, staying updated with the latest news, video watching in YouTube, sending e-mails, live weather forecasts, simple calculations, Wikipedia powered AI, utilization of Google Maps, keep tracks on time, operating system-based tasks like shutting down the PC, Restarting the PC, etc, plays songs, tells pyjokes, makes notes and last but not the least, greets the user when called by name.

## Reactive Mass Diffusion in Viscoelastic Fluid Past a Stretchable Exponential Sheet Due to Variation in Wall Concentration

Kamal Debnath and Sankar Singha.

**Abstract.** An investigation is initiated to study the solute diffusion with chemical reaction of the first order in non-Newtonian viscoelastic fluid through boundary layer over a stretchable exponential sheet due to variation in wall concentration. Walter Liquid (Model B/), a model of non-Newtonian fluid, exhibits the fluid's viscoelastic nature. The chemical reaction rate and distribution of wall concentration for the species are taken in exponential form. Utilizing suitable similarity variables, the equations guiding fluid motion and relevant satisfying boundary conditions are simplified to self-similar forms. The MATLAB solver 'bvp4c' is used to evaluate the resultant equations. The concentration profiles computed numerically for different involved flow parameters are plotted. The impact of flow feature factors on the concentration profiles is analyzed from graphs from a physical point of view. The mass diffusion process due to chemical reaction in viscoelastic flow through boundary layer past a stretchable exponential sheet affected noticeably with the variation of wall concentration.

## Technology Adoption for Facilitating Knowledge Management Practices in Firms

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**Abstract.** This paper aims at highlighting technological dimensions for knowledge management (KM) practices in firms with review of the potential conception of activities adopted by organisations to utilize the knowledge resources. The study systematically reviews the literatures available on KM practices with excluding articles based on keywords, abstracts, and full text. KM practices were incorporated in the Heisig's (2009) categorization format of human, technology, organization and management process oriented practices. The findings described that learning and sharing attitude in human, are effectively directing adoption of technological tools for KM in firms. Top management support and strategy are also key KM practices supporting technology usage. In term of originality and value, the paper reviews all latest technologies and their integration for supporting KM in firms. The study promotes for faster and accurate business ideas with accumulation of advanced technological tools for knowledge storing, sharing and application. The famous Nonaka and Takeuchi (1995) KM Model is adopted to integrate the technology and KM practices.

## Slip Flow and Heat Transition for Hydromagnetic Elastico-viscous Fluid past a Flat Moving Plate

Kamal Debnath and Bikash Koli Saha

**Abstract.** A theoretical approach has been made to investigate the hydromagnetic and slip impact on heat transport for elastico-viscous boundary layer fluid flow past a flat moving plate considering non-Newtonian fluid model Walters Liquid (Model B/). To transform equations governing fluid motion to solvable form, similarity variables are introduced to obtain the self-similar resulting equations. The specially designed solver 'bvp4c' of MATLAB for solving boundary value problems is used for numerical computation. To study the influence of hydromagnetic and slip parameters on the elastico-viscous fluid together with other flow feature parameters, the computed results are plotted for discussion purpose from physical standpoint.

## Comprehensive analysis of various distance metrics on colour based CBIR System

Shaheen Fatima

**Abstract.** In the recent decades, lots of images have been added to the database and is growing rapidly. Since the database is very huge, hence retrieval and querying of these images becomes difficult. The Content Based Image Retrieval (CBIR) system provides an efficient option, that is based on extraction of image features and compare. The primary method of feature extraction in CBIR system is based on the colour content of images. Finding the similarity among image features is mainly based on distance metrics and it plays crucial role in image retrieval. There are many such similarity metrics found from literature, few of them perform well on some specific cases. Thus, it is important to know, the appropriate metrics for optimal image retrieval. This article presents a comprehensive survey on various popular distance metrics on wide range of image database. The survey is based on finding the similarity of image features, that are based on colour content of an image. The survey gives good insight into the similarity measuring metrics. The popular set of large image database is used for analysis purpose. The results show, superiority of Canberra and Bray-Curtis distances over other distance metrics.

## Numerical Simulation of MHD Viscous Fluid Flow over a Porous Stretching Surface with the Effects of Power-law Heat and Mass Flux

Ashim Jyoti Baruah and Rupjyoti Borah

**Abstract.** A numerical investigation has been made to analyze the simultaneous effects of both thermal and mass transmissions of viscous fluid flow caused due to an extending surface that is situated at a porous medium. A homogeneous magnetic field is utilized in the vertical direction of the flow. The non-linear supported equations are modernized into solvable form by employing similarity transformation. The MATLAB routine bvp4c scheme is taken up to carry out the results of the problem. The results are discussed in terms of pictorial mode with different novel flow parameters. From the results, it is perceived that the temperature and mass fraction of the fluid enhances from water to oil and hydrogen to ethanol respectively.

## FREE CONVECTIVE OSCILLATORY FLOW OF VISCO-ELASTIC DUSTY FLUID IN A CHANNEL WITH INCLINED MAGNETIC FIELD

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**Abstract.** The time dependent oscillatory flow of a conducting visco-elastic dusty fluid with inclined magnetic field and radiation through a vertical channel filled with a saturated porous medium is under consideration. In the Cartesian coordinate system, x-axis lies along the centre of the channel, y-axis is the distance measured in the normal direction. The motion of visco-elastic fluid with dust is governed by second-order fluid model and Saffman model. The partial differential equations governing the motion of fluid and dust are obtained and solved by analytical method. The analytical expression for velocity field, temperature field, shearing stress and volume rate of flow are obtained. Velocity profile, shearing stress and volume rate of flow of the fluid motion and dust particles have been represented graphically for different values of flow parameters involved in this study.

## CARGIoT: Concept Application Review in Green Internet of Things

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**Abstract.** The Internet of Things (IoT) is an emerging technology around the world that helps in connecting different sectors and human beings to the Internet. This connection has different network technologies and application protocols that contain physical objects with embedded sensors that can transfer information to the internet with the help of network technologies. Several factors challenge the development of the Internet of things. Security and privacy are the measure concern, data released in IoT is a huge amount. Managing this big data is one of the challenges. Sensors used in IoT devices are low-powered devices, its efficient use is also a challenge in IoT. This is the motivation for doing research on energy-efficient and moving towards Green IoT. In this paper, we have given a light to review Green IoT and its architecture, its application, and protocols used in Green IoT. This research paper helps in giving a comprehensive review to other researchers.

## Stock Price Analysis using LSTM

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**Abstract.** The most important aspect of the stock market is finding a stock in which anyone can put their money with confidence. Most traders these days don't know where to invest or on what premise to put their money. In this work, we created a strategy that assists traders in deciding whether or not to put their money in a specific stock. This method is being developed by leveraging Long Short Term Memory (LSTM) in Machine Learning to anticipate stock performance based on prior data from the firm.

## A User Independent Recommendation System for Web-Series

Aditya Vikram Singhanian, Anuran Bhattacharya, Priyanka Banerjee, Ritajit Majumdar, Debasmita Bhounik

**Abstract.** The number of people streaming content over the internet has boomed in the recent years. However, streaming platforms have to promote the right kind of titles to the right people in order to keep them interested in using their platform and that is why a recommendation engine is important. Different people choose to like webseries in different ways. Some like to watch multiple shows of their favorite actor, while some prefer some genres over others. Therefore, not only do the recommendations have to be accurate in the sense of similarity, but that similarity also has to be localized to within parameters, set by the user. In this paper we have proposed a recommendation system that can recommend web-series to a user without any extensive data. Our recommender can recommend TV shows, both using all possible and localized parameters, tailoring the recommendations to exactly what the user wants, without imposing the bias of other users on them.

## Study of Power Law Fluid Flow through a Stretched Vertical Surface with Viscous Dissipation and its Rheology

Debasish Dey and Bhagyashree Mahanta

**Abstract.** An analysis on steady flow of Hydromagnetic power Law fluid past a stretched surface which is vertical together with viscous dissipation has been carried out. The governing equations pertaining to velocity curve, temperature and concentration curves has been derived and further elucidated by bvp4c method which is built- in the MATLAB software. The above mentioned profiles for various fluidic parameters are shown graphically in this paper. Also, the tabulation for skin friction for different parameters is also shown. It is witnessed that Magnetic parameter (M) aids in lowering the shear stress in shear thickening fluid. Also, a fall in temperature is noted as Prandtl Number (Pr) is increased.

## More patients or more deaths: Investigating the impact of COVID-19 on important economic indicators

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**Abstract.** The impact of COVID-19 over various sectors has continued to interest researchers. This work will investigate the impact of COVID19 for economic uncertainty and gold price across various countries. This investigative research is done with the help of Panel data concept programming packages associated with the R programming language and therefore we can call it longitudinal research. The current research deals with two important features related to COVID. These two are monthly COVID patient average and monthly COVID death average and data is collected from countries such as India, China, Russia, USA, UK, Japan and Germany and apply Panel data regression techniques to understand whether these two COVID related factors significantly impact upon economic uncertainty and gold prices. The current work also observes that the monthly confirmed COVID patient average have more impact across the spectrum of countries on the economic policy uncertainty and the gold price in these countries compared to the other feature i.e. monthly average COVID death tolls. The same conclusions have been made in the graphical abstract as depicted below.



## Analysis On Potential Use of Crowdsourcing in Different Domain Using Meta-Synthesis

Nivedita Kasturi , S G Totad , Goldina Ghosh

**Abstract.** The concept of crowd-sourcing is gaining its importance in all the domains viz innovation, micro tasking, health care, software engineering, education and many more. People and people are the important part of society in day-to-day life. How the potential of crowd can be utilized in all domain is becoming an interesting topic of research. In this paper we tried to gather information and techniques from all the domains where the crowd activity and communication is utilized. There was no comprehensive literature review carried out on crowd-sourcing for the filed as a whole. Most of the reviews are concentrated on specific field like data acquisition for machine learning, micro tasking, emergency management and so on. Here we tried to combine all the research under single umbrella and conduct analysis and synthesis on the data collected. We tried to find what is the least touched area and which domain was given more importance. What are the reasons for most people to work in particular domain and how to drag researcher's attention towards least touched domain? A systematic review process is followed using the keyword search and including subtopic search using advanced search provided by sources like IEEE, Springer and Elsevier etc. Then the screening was done using the reference section for most cited papers. The meta-synthesis is being used for finding the answers to all the questions posed.

## A Simulation of Nanofluid Flow with Variable Viscosity and Thermal Conductivity over a Vertical Stretching Surface

Debasish Dey, Rajesh Kumar Das and Rupjyoti Borah

**Abstract.** An effort has been put numerically to explore the nanofluid flow in porous medium past a vertical elongating surface with thermal and mass transportations by considering the non-homogeneous flow factors. In methodology, adopting some pertinent similarity conversions, the non-linear governing PDE's are converted into its corresponding ODE's and this system of ODE's are solved numerically utilizing MATLAB built in bvp4c solver scheme. The results are displayed through pictorial mode in terms of velocity, thermal and mass fractions of the nanofluid. This fluid model has imperative applications in the modern times due to the presence of non-homogeneous flow factors and nanoparticles. Due to the presence of nanoparticles, the Brownian motion and thermophoresis parameter have played a great rule during the flow.

## Developing Smart ML Based Recommendation System

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**Abstract.** Sometimes, music plays an important role in our life. Whether you are sad or happy, music plays an important factor as it expresses your mind, also the importance of music in your life will depend on your personal experience. This Recommendation System is developed for those users who express their feeling and prefer listening as well as viewing music videos depending on their choice. The recommendation system will filter out the contents depending upon user choice with similar data. For this Recommendation System, two techniques are used which are Collaborative Filtering and Content-based filtering. Considering the issues for some users while searching they can play music with help of a voice assistant.

## Soret and Dufour effects on MHD Micropolar fluid flow with heat and mass transfer past a horizontal plate in porous medium

Krishnandan Verma

**Abstract.** In the present study, efforts have been made to investigate numerically the impact of Soret effect along with its reverse effect i.e. Dufour effect on steady, MHD micropolar fluid flow over a horizontal plate which is semi-infinite in extent with the transmission of heat along with mass in a medium taken to be porous. The effect of chemical reaction and heat source is further considered. Appropriate dimensionless transformations are used to reduce the equations governing the problem to non-dimensional form. The numerical solution of the problem is obtained in graphs for velocity, angular velocity, temperature and concentration distributions for important parameters affecting the problem using bvp4c, which is inbuilt solver in Matlab. Coefficient of Skin-friction, surface couple stress, Nusselt number as well as Sherwood number are determined. The validity of our solution is established when the current outcomes are compared with some other published work. Numerical findings show that Soret and Dufour number boost the heat transmission rate but slow the mass transfer rate.

## Experimental Study on Resource Allocation for a Software Defined Network based Virtualized Security Functions Platform

S.D.L.S. Uwanpriya, W. H. Rankothge, N.D.U. Gamage, D. Jayasinghe, T.C.T. Gamage and D.A. Amarasinghe

**Abstract.** With the advancements of technology, outsourcing organizations' applications such as web servers, email servers and security functions such as firewalls, intrusion detection systems etc. to Cloud Service Providers (CSPs) has become a general practice within the business community. CSPs use their cloud infrastructure and provide these applications and Virtualized Security Functions (VSFs) as services. Also, they take the advantage of Software Defined Networks (SDN) approach to managing their network, which uses a software-based controller to maintain a programmable data plane. When providing VSFs as a service, resource management is one of the core aspects to consider as it drives the CSPs business towards profit, utilizing the resources to the maximum. In this paper, we have introduced a resource allocation approach with the objective to use existing non-used VMs with the minimal CPU and RAM variance, compared to the required CPU and RAM for a VSF as much as possible. According to our performance evaluation observations, the resource allocation decision is taken within few milliseconds.

## Heterogeneous BigData Analysis in IoT Cloud Environment

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**Abstract.** People may now gain important insight into huge heterogeneous data created by IoT devices, thanks to a variety of big data, IoT, and analytics technologies. This paper examines the most recent academic initiatives focused on massive IoT data analytics. The connection between big data analytics and the IoT is explained. Furthermore, by introducing a novel paradigm for massive IoT data analytics, this research review introduces different types, methodologies, and technology for massive IoT data analytics. The advantages of data analytics under the IoT paradigm are then highlighted. Finally, future study directions include open research challenges, visualisation, and integration. The Internet of Things is considered as a catalyst for the creation of intelligent, context-aware services and applications. These services could respond to changes in the environment in real time.

## Unsupervised Hybrid Change Detection using Geospatial Spectral Classification of Time Series Remote Sensing Datasets

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**Abstract.** This paper presents a hybrid spectral unmixing-based change detection approach for the time series remote sensing datasets. The proposed approach has an enormous capacity to act positively with the complex and heterogeneous background and distortion present within the datasets because of sensor errors and environmental hazards. The entropy and geo-spatial information have been adopted in the classification process followed by the smoothing operation, which improves the efficacy of the proposed method for time-series datasets. The derivative-based linear comparator with morphological operators has been applied on the binary classified datasets to estimate the changed elements and geospatial positions as the changed map. Ultimately, the efficacy and estimated outcomes of the hybrid classification-based change detection approach for the Yellow river estuary of China have been validated using quantitative parameters i.e. overall error, percentage correct classification, kappa coefficient, and change map image. The presented approach is thoroughly compared with the state-of-the-art and advanced changed detection approaches and found that the proposed method is superior in numerous ways.

## Using HMM, Association Rule Mining and Ensemble Methods with the application of Latent Factor Model to detect Gestational diabetes mellitus

Jayashree S Shetty, Nisha P Shetty, Vedant Rishi Das, Vaibhav and Diana Olivia

**Abstract.** Gestational diabetes mellitus (GDM) is a condition often seen during pregnancies in which a hormone made by the placenta prevents the body from using insulin effectively. Women with GDM are at an increased risk of complications during pregnancy and during delivery. The offspring and the mother are also at an increased risk of getting diabetes in the future. Therefore, careful screening is necessary to avoid further complications. The objective of this research is to facilitate proper prediction of the presence of GDM in women so that timely intervention can help prevent future adversities. Multiple machine learning algorithms with data analysis methods are employed to investigate the probability of GDM and reach an optimal solution. The methodology makes use of the latent factor model and stochastic gradient descent to account for the missing data. Information entropy is used to calculate the amount of information each variable presents. The final classification is done and compared using three methods. These include ensemble method, hidden Markov model, and association analysis. Experiments reveal that the ensemble method involving decision trees, k-nearest neighbours, and logistic regression with weighted averaging delivers promising performance. Test data accuracy of 80% was recorded on the ensemble method.

## CYBER SECURITY VIS-A-VIS ARTIFICIAL INTELLIGENCE: AN ANALYSIS OF THE INTERNATIONAL CONVENTIONS

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**Abstract.** The expansion of digitalization, not only has brought convenience to individuals, however, it has resulted in the vulnerabilities of the data and threat to cybersecurity. Where a new age technology in form of Artificial Intelligence has intruded into many fields, cyberspace is no exception to it. Artificial intelligence can be a technology to make cyberspace a more secure palace but the same technology can be utilized by the cybercriminal to penetrate cyberspace resulting in the breach of individual privacy. Protection of individual rights has been the sole objective of international organizations and the conventions. However, with the rise of Artificial intelligence and its intrusion into the cyberworld, the prevalent international laws don't appear to be competent enough to secure individual rights. Two major questions of research have been addressed in this study, namely (1) what are the issues and challenges posed by artificial intelligence, and (2) whether the laws

governing the use of Artificial intelligence are self-sufficient to regulate cyber security intact or not. Through this paper, an attempt has been made to analyze international conventions governing AI and their relevancy in reference to cybersecurity.

## Trust based resolving of conflicts for collaborative data sharing in online social networks

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**Abstract.** 21st century, the era of Internet, social networking platforms like Facebook and Twitter play a predominant role in everybody's life. Ever increasing adoption of gadgets such as mobile phones and tablets have made social media available all times. This recent surge in online interaction has made it imperative to have ample protection against privacy breaches to ensure a fine grained and a personalized data publishing online. Privacy concerns over communal data shared amongst multiple users is not properly addressed in most of the social media. The proposed work deals with effectively suggesting whether or not to grant access to the data which is co-owned by multiple users. Conflicts in such scenario are resolved by taking into consideration the privacy risk and confidentiality loss observed if the data is shared. For secure sharing of data, a trust framework based on the user's interest and interaction parameters is put forth. The proposed work can be extended to any data sharing multiuser platform.

## Systems biology paradigm for exploring the relation between obesity and ovarian cancer with a focus on their genome-scale metabolic models

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**Abstract.** Obesity is an intricate condition that has been related to the precarious development of lethal gynecologic cancers including ovarian cancer. Ovarian cancer offers a significant number of metabolic dysregulation profiling opportunities, which aids drug discovery and development. Despite the reality that extensive studies have been undertaken on the area, the connection between body weight and ovarian cancer remains uncertain. Genome-scale metabolic models (GEM) are a useful tool in this situation because they represent the metabolic framework of cells and provide a practical platform for simulating and measuring metabolic fluxes in human beings using constraint-based mathematical methodologies. The model obtained can be utilized for understanding cell metabolism. The dataset GSE130350 was utilized to evaluate and create a model to comprehend their reactions and metabolites. The flux score was calculated by the Recon3D based metabolic model using MATLAB's Cobra toolbox and Python's Cobrapy, and data analysis was done. The resulting model consists of 10610 reactions and 5837 metabolites with a flux score of 1.72. Absolute quantitative gene expression data has been defined to predict genome-scale flux patterns. RNA sequencing methods like single-cell RNA-seq (scRNA-seq) method and bulk RNA-seq method were used for understanding gene expression. scRNA-seq was designed to exhibit distinct cell behaviour in relation to its environs, bulk RNA-seq on the contrary, was never meant to characterize a cancer formation precisely.



## Startup Profit Predictor using Machine Learning Techniques

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**Abstract.** Startups focus on uplifting and transforming the old markets by bringing in new technologies that may possess the power to bring a revolution in the world. Hence, they find it very essential to keep their venture in a profitable position from beginning itself so that they can achieve their goals sustainably. Intelligent systems which use Machine Learning can process huge amount of statistical data and can be used to predict profits based on the startup's various expenses and other parameters. This can help them in regulating their expenses and grow quickly. The predictor makes use of four parameters, i.e., Spend on R&D, Administration, Marketing [22], and the location where the startup is based out of, and predicts an approximate value of the profit that it's most likely to make. On finding the perfect dataset, data pre-processing and data visualizations were done. The data was split for training and testing and the score of the model obtained on the test dataset was 0.9691. The Startup Profit Predictor was successfully built using Random Forest regressor model and it can be used for making profit predictions with 96.91% accuracy.

## From the Perspective of Digital Transformation: Amazon's Tryst with Competition Law

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**Abstract.** With the unprecedented shift to the online space, as a catalyst for digital transformation, the dynamic e-commerce industry finds itself presented with the best opportunity to grow and cater to a large demographic. Having taken interest in the industry, the CCI, apart from conducting studies and meetings along the subject lines, initiated an investigation into the actions of e-commerce retailers which include Amazon. This paper makes a comparative analysis of Amazon's practices and its interaction with the antitrust laws in the US and addresses the same in the Indian context, whether the amazon.in would be classified as an enterprise following unfair trade practices.

## RIGHT TO BE FORGOTTEN IN A POST- AI WORLD: HOW EFFECTIVE IS THIS RIGHT WHERE MACHINES DO NOT FORGET?

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**Abstract.** The right to be forgotten is the concept wherein an individual has the right to request for data deletion. While it is simple from human perspective, data-deletion becomes complicated when an AI based technology is involved as AI neither process the data nor do they 'forget' the way humans do. The laws on privacy have been enacted from the perspective of human memory and therefore, their efficacy is in question when AI based technologies process the data. Data protection laws are majorly about safeguarding the right to decide how the information is being used by the algorithm. This can become challenging when the data processing is done by an artificially intelligent entity, since it would be difficult to understand and explain how the information is correlated and used in the specific process. Moreover, the privacy rights can be exercised only when the individual is aware of the process details regarding the usage of the data. In this paper the authors have analysed the right to be forgotten in the context of AI and explored legal provisions in the light of how far this right can be exercised with AIs.

# ANALYSIS OF CHINA'S NEW MEDIA, REGULATIONS AND VIOLATION OF HUMAN RIGHTS

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**Abstract.** The famous line given by George Orwell “Until they became conscious they will never rebel, and until after they have rebelled they cannot become conscious”. There is no country that doesn't follow certain regulations on their e-platforms. These regulations are justified only till it's helping to maintain peace and tranquility of the nation. These regulations should not be such as to trample on the rights of individual to have freedom of speech and expression. In this paper, author have analyzed the China's new regulations dealing with social media and cyber-crime and to what extent these regulations are stringent in order to control the media and violation of fundamental right of freedom of speech and expression which is against the basic human right, briefly discussed PIPL regulation.

## IRIS: A pragmatic approach to build an Integrated and robust IOT system to counter malware

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**Abstract.** In the current scenario, the necessity of IoT security and the prevention of system misconfiguration has become unequivocal. Recent inclinations have presented a staggering upsurge in the rate of malware targeting IoT and other end-point devices. Cyber-attacks on IoT devices are booming, as people and organizations are purchasing ‘smart’ devices such as routers, security cameras, on surplus mode and do not considers them worth protecting and often these devices are misconfigured making them vulnerable to attackers. Majority of attacks on IoT devices are not sophisticated but more stealth-like so that the user does not notice that their devices are being exploited. This paper depicts implementation of IRIS. IRIS an acronym for Integrated and Robust IoT System, focuses on the security of IoT devices as well as caters to the need of proper access control, two factor authentication and also offers real-time scanning and malware protection.

## GDPR ORIENTED VENDORS CONTRACTS IN RELATION TO DATA TRANSFER: ANALYSIS OF STANDARD CLAUSES 2010 & 2021

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**Abstract.** Nowadays, data protection and its laws been in an unstoppable debate. Every countries have established their own data protection law in respect to European Union GDPR (Global Data Protection

Regulation). Each & every organizations of any sector have to comply with some global standards while dealing with some other organizations which have been termed as vendors and to ensure them that they have took appropriate measures for protecting the information of consumers or employees. Standard contractual clause has been established by EU (European Union) in which two major terms have been discussed under which liabilities have been defined. These two major terms i.e. Data Processors and Data Controllers discussed in whole contract. In 2021, new Standard Contractual Clauses (SCC) have been published which has defined the similar liabilities of Data Processors and Data Controllers unlike of 2020 SCC, the liabilities are different. In this paper the author have analysis both 2020 & 2021 Standard Contractual clauses and their implications.

## Age, Gender, and Gesture Classification using Open-Source Computer Vision

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**Abstract.** In every country, there are a plethora of laws whose very foundation stands on the age of the concerned. Similarly, successful gender recognition is essential and critical for many applications in the commercial domains, like human-computer interactions: such as computer-aided physiological or psychological analysis of a human. In this work a face and gesture detection & verification system is proposed that classifies them on the basis of gender while providing the most probable age-range of the concerned face and also detecting the gesture of the hands using convolutional neural network architecture. The principal idea behind the system is to compare the image with the reference images stored as templates in the database and to determine the age and gender.

## AN ANALYSIS OF LEGAL and CYBERSECURITY ISSUES IN INTERNET OF THINGS

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**Abstract.** Nowadays, the technologies in the world developing a lot. Daily new technologies or new versions of existing technologies have been popping up with some benefits to the world. Just like artificial intelligence which has changed the life of people, similarly Internet of Things (IoT) helps the citizens to work more efficiently and to grow more. IoT linked with other technologies have changed the nature of work for the organizations and living style of human beings. Hence, the meaning of IoT in simple words is network of physical objects which means the physical devices/objects embedded with other technologies for the purpose of connecting and exchanging information/ data with other devices and systems over the internet. IoT plays a beneficial role in every sector such as education, agriculture, healthcare and it has been deeply interwoven in the lives of peoples and societies. Benefits aside, exchanging of data and connecting to the internet, also connecting to potential cyber threats/crimes, where cyber security concept/ law comes into picture. In this paper the author have discussed the evolution and meaning of Internet of Things, challenges involved, security in IoT and its legal implications with special references to Indian laws.

## Estimated Time of Arrival for Sustainable Transport using Deep Neural Network

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**Abstract.** Time of arrival estimation is a challenge in a world where swiftness and accuracy is a new normal. During the year 1997, a summit in the United Nations showed concern for sustainable transport. This sustainability is for rural-urban linkage, pollution-free environment, health etc. We understood the importance of estimating the time of arrival for the sustainable transportation and formulated a deep neural network model which increases our estimation of the time of heavy vehicles from source to destination. In our proposed research paper, we created a grid-based network dataset from a raw GPS truck data stored in a form of Data Lake. We introduced a vanilla neural network with three-layered architecture which works well with our grid-based dataset. Gradually the velocity and volume of data increased and the dataset obtained was with labeled attributes of continuous type. The traditional Machine Learning Algorithms failed or took more time to train on rapidly increasing GPS-Dataset. The Vanilla deep neural network in a three-layered architecture outperforms various our deep learning method with an accuracy of 85%.

## Texture Feature based on ANN for Security aspects

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**Abstract.** Centered on ELM, to achieve high-performance picture steganography, we suggested an innovative OEPF model. An updated ELM algorithm is used in this method to set up the supervised computational framework to evaluate the optimized hiding picture position with a minimum distortion. The ELM is trained on a part of the image and checked in regression methodology to pick the optimum message hiding spot. It has permitted the supreme outcomes of the expected measurement indicators to be obtained. Training is carried out on the basis of a collection of extracted textures, statistical characteristics and their related visible imperceptibility metrics that use a portion of the graphic. For output enhancement, the learned model is further utilized. To surpass the current innovative frameworks, the proposed model is shown.



## ML based prediction model for cardiovascular disease

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**Abstract.** In this paper, the Prediction of Cardiovascular Disease model based on the Machine Learning Algorithm is implemented. In medical system applications, data mining and machine learning play an important role. Machine learning algorithms will predict heart disease or cardiovascular disease. Initially, online data sets are applied to preprocessing stage. Preprocessing stage will divide the data from baseline data. In the same way, CVD events are collected from data follow-ups. After that, data will be screened using the regression model. The regression model consists of logistic regression, support vector machine, naïve Bayes, random forest, K-Nearest Neighbors. Based on the techniques, the disease will be classified. Before classification, a testing procedure will be performed. At last from results, it can observe that accuracy, Misclassification, and reliability will be increased in a very effective way.

## Enabling Secure and Transparent Crowd Funding Approach powered by Blockchain

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**Abstract.** Now a day, crowdfunding is the most prominent area which the people are using to generate and create the funds. This is not only popular in developed countries, but also popular in developing countries. In India, the scope of the crowdfunding is increasing exponentially. Blockchain is one of the best way to do the fundraising and Crowdfunding. Many MSE and organizations are practicing the crowdfunding to raise funds for their infrastructures and the projects. The large number of people can easy contribute their funds electronically. Traditionally, the task was done in form of bank loans and partnerships, now the digital world has given so many options to raise the funds. Entrepreneur can easily generate the fund through the crowdfunding platforms. The proposed system addressed the various issues and their solutions to use the crowdfunding platforms. The article shows an approach and methodology which is secure and transparent to raise the fund using Blockchain architecture.

## Incorporation of Secure Channel Communications over Multi-tenant Database

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**Abstract.** The Enterprise IT industry is undergoing a paradigm shift – with the help of cloud computing which is one of the main reasons. The popular IT giants such as Google, IBM, Microsoft, and Amazon have started their cloud computing infrastructure. SaaS (Software as a Service) has been one of the major business models to provide cost saving Enterprise services to small and medium enterprises (SME). In SaaS cloud provider provides their services to their customer's on rental basis which is usually very less as compared as paying for licensed applications. Multi-tenancy which is an important feature of cloud computing provides a concept named multi-tenant database; is a relational model-based database architecture where single instance of the database servers multiple customers called Tenants. The application is planned to virtually partition its data and configuration and tenant is provided with a customized virtual application. However, the customers are often reluctant to store their highly confidential data using multi-tenant database in the fear of their information being exposed to other tenants either due to some application bug or any passive or active attack on the database. So, here we define a highly secured model of a multi-tenant database protected by different encryption algorithms. Every stream of data that travels through the channel is encrypted using AES encryption and is stored in database in encrypted form. Further, the key generated by AES algorithm has been encrypted using RSA encryption and stored in database data. The particular key corresponds to a particular User ID, So, even if the data is exposed to some unauthorized user due to some application bug, that will not be decrypted. Further, role-based access control (RBAC) defines the roles of different tenants and sub tenants using the application.

## Quantum Implementation of Reversible Logic Gates using RCViewer+Tool

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**Abstract.** To investigate quantum implementation method for estimation of quantum cost of reversible logic gates. Proposed quantum implementation method is used for estimation of quantum cost of reversible logic gates and further verification using RC Viewer+ tool to justify quantum cost. Proposed quantum implementation method is applied on R Gate and tested using RCViewer+ tool to justify quantum cost. The quantum implementation and related quantum cost of many invented gates is still unknown in literature. This paper deals with the approach to determine quantum implementation of reversible logic gates so that it can be beneficial to utilize process in investigation of new proposed reversible logic gates and their associated architectures.

## Smart Health Care System For Elders' Home To Monitor Physical And Mental Health In A Controlled Environment

Abhilash Krishan, Chinthaka Yashoda, Dilini Madhumali, Gayan Pradeep

**Abstract.** Nowadays, with the busyness of lifestyle, the focus on parents has diminished. At the same time, the need for nursing homes has increased. As the number of elderly people in nursing homes increases, the number of elderly people living there cannot be considered individually. And nowadays people are not willing to work in such places. Because they have to work without pay or at low wages. About 95% of seniors in nursing homes have poor health. And their behavior patterns are very different. For these reasons, the authority to manage nursing homes faces a major challenge. They have a big role to play in giving each adult proper medication and healing their mental level. As a solution to this problem, Authors hope to compare it with technology and provide a solution. Authors decided to create the relevant items and software for this. This is done using an adult friendly handrail and camera system in the proposed methods. Advanced ML, Image Processing and Hardware parts are used in this technology world. This allows you to focus on each adult 24h throughout the day. One of the main benefits of this is that it pays more attention with less staff. According to our survey, this has proved to be an essential factor for nursing homes. By creating this, it will be possible to provide healthier and more productive services to the elderly.

## Sentiment Analysis in Airlines Industry using Machine Learning Techniques

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**Abstract.** With the increasing power of internet, businesses get a huge number of customer feedbacks through: their business website, social media page, business listings etc. Majority of business do not know how to use this information to improve themselves. However, unstructured feedback on Facebook/Instagram/Twitter is where the volume lies. But the problem is these feedbacks are unstructured and there is no aggregated sentiment that we may conclude from them. To analyse these unstructured customer feedbacks at scale, machine learning is used. In this work we present a survey on various machine learning techniques that have been used in past eight years for analysis of tweets/comments related to airline industry.

## Review of Detection of Packets Inspection and Attacks in Network Security

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**Abstract.** In this paper, different types of attacks and their malicious act behind the scenes are presented. The solutions to defend the victim against attacks are given. In today's scenario when hackers typing away incessantly on keyboards, juggling multiple computers to take down a group of individuals, the user needs to focus on identification and solution from such misbehavior acts. Therefore, the paper includes the detection through acquiring knowledge about packets in networks, functionality of malicious attacks, deep packet inspection (DPI) mechanism together CIA triads and further prevention from new attacks by knowing the behaviour of all kind of attacks.

## Role of Multi Agent Systems in Health Care: A Review

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**Abstract.** A multi-agent system (MAS) is a complex system consisting of multiple intelligent agents which can operate in an autonomous manner, yet can still act in a consistent way due to the information connections amongst them. With the growth in population, demand for the healthcare services has also been increased. Multi-agent systems play a very significant role in the health care services. It has been analyzed that very few models have been proposed in the area of women and infant healthcare. In this paper, we have presented a comprehensive review of the research work for the use of multi agent systems in different aspects of healthcare system and find out the research gaps in the same

## Facial recognition to detect mood and play songs using Machine Intelligence

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**Abstract.** Face recognition technology has gotten a lot of press because of its vast range of applications and market possibilities ranging from gaming, security to entertainment [5]. It's used in a variety of fields, including security systems, digital video processing, and so on. When there are hundreds of songs, it is difficult for music listeners to manually create and segregate the play-list. The system's overall concept is to determine the song's mood based on the presence of tags in the lyrics, and then, using the mobilenet model, to detect the user's emotion and play the song on the music player according to the user's preferences. To create the required system, we employed two separate models: the Music mood prediction model and the Mood detection model utilising face recognition. We applied tf-idf on a variety of classifiers, with a particular focus on the Random Forest classifier. For detection of the face Haarcascade method was employed. The FER Dataset was utilised to train the model using the mobilenet model.

## Banana Leaf Diseases and Machine Learning Algorithms Applied To Detect Diseases: A Study

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**Abstract..** The world is changing continuously, nothing is permanent. What we think is new today becomes obsolete in a few days with better versions. All things have become computerized day by day. People are opting for technical methods to deal with the changes rather than following traditional methods. Agriculture is not an exception. Since in India, 70% of the population is dependent on Agriculture and also agriculture has a 20.5% share in India's GDP i.e. 17 to 18 percent of India's income comes from Agriculture, farmers have started opting for new methods to increase the productivity of crops. Researchers are working on Artificial Intelligence-based technologies to increase the life of crops by which crop diseases can be predicted in their early stages. India is a land of agriculture and there are varieties of crops available. Since there are different climatic conditions, depending on which soil also changes its behaviour. Pests are also a major problem. Image Processing has evolved as an effective thing for the early analysis and detection of plant disease. Several algorithms have used to analyse the diseases at the early stage that results in minimum loss to the farmers and good quality of crops. This paper is presenting a study on the diseases found in banana crop along with their solutions available. This paper is different from other survey papers because it has focused mainly on banana crop while study had done on multiple crops earlier in a single paper.



## The State of Art in Information Security Epoch Iterated Function System in Fingerprint Images

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**Abstract.** Biometric identification is the process of determining a person's identity. Everyday people want to protect their personal belongings and have easy accessibility to it at a fair cost. Biometric –based identification is more-secure than any other technique since it binds an identity to a specific person rather than a password or a code that anybody could use. Other security measures, such as smart ID cards and chips are frequently paired. One of the important biometric systems is fingerprint images. Iterated function systems are self-similarity based method for creating fractals. In this paper, it obtains an Iterated function system for fingerprint images which leads a good representation of the given images.

## Covid-19 prediction analysis using machine learning approach

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**Abstract.** The unforeseen outbreak of Covid-19 which resulted in a global pandemic posed a threat to the human civilization. The entire world is trying their best to combat against the outspread of the disease. The rapid spread of the disease has put governing bodies under pressure and made it difficult to confront the situation. The RT-PCR which is the test confirming if a person has Covid-19 infection, is restricted by the shortfall of reagents, time taking, high cost and need for dedicated labs with trained pathologists. With the sudden rise in daily cases, there were large queues for Covid-19 tests, stressing the medical laboratories with many such laboratories facing shortage of kits for testing. Hence, there is a requirement for cost effective and quick diagnostic model to determine positive and negative cases of Covid-19. This paper aims to predict Covid-19 infection in an individual person from initial symptoms and information like fever, cough, sore throat using machine learning algorithms. The study includes working with six predicting models, MLP, GBC, Decision tree, SVM, Logistic Regression and Random forest with highest accuracy of 92.94% achieved in logical regression. The results can help in the initial diagnosis of Covid-19, especially when there is a shortage of RT-PCR kits, specialized laboratories and to screen large number of patients.

## Comparison Based Analysis and Prediction for Earlier Detection of Breast Cancer Using Different Supervised ML Approach

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**Abstract.** Breast cancer is one of the most leading diseases in women which leads to an increase in the mortality rate unexpectedly. The tremendous growth of breast cells forms tumors that sense as lumps. Generally, two categories are most important Benign (non-cancerous) and Malignant (cancerous). In medical science different treatment strategies are there to identify which kind of tumor it is (Benign or Malignant). Image tests (X-Rays, CT SCAN), ultrasound, MRI, Radiation therapy, Chemo therapy, immune therapy, Surgery, Biopsy are the most common techniques that are used in hospitals depending upon different stages of lumps which is very important but expensive in breast cancer detection. As a solution in our paper, we have discussed a comparison-based analysis of different machine learning approaches on Wisconsin Breast Cancer (WBC) dataset for measuring the variance (Deviation between Training accuracy and Test accuracy) for early detection of breast cancer. But the question is what happens when the dataset is noisy or binary classification (Benign or Malignant) is crucial. SVM (Support Vector Machine) is an improvement over accuracy measure with respect to others. Binary classification is not possible always for higher-dimensional data, sometimes data that is not separable in 2D may be separable in 3D or higher dimension using transformation known as Kernel trick. In our literature, we have computed variance against nine machine learning models, three out of them (Gaussian Naïve Bayes's (0.014330739682853), SVM-polynomial (0.019316054532322), SVMsigmoid (0.000344725696839)) provides positive variances whereas others are provided negative variances (Logistic regression (-0.046554384582553), KNearest Neighbor (-0.018483863554286), Decision Tree (-0.083916083916084), Random Forest (-0.009291178305352), SVM-linear(-0.023227945763157), SVMRBF (-0.018533110082405)). Positive variance is an improvement of test accuracy whereas negative variance is a loss of test accuracy. Our goal is to consider only positive cases among which give the best result (where the variance vanishes or approximately tends to zero).

## Route Optimization for Waste Collection

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**Abstract.** The Vehicle Routing problem is a synonym used in the enclosure of transport, distribution, and outsourcing to optimize routes. Route planning techniques are one of VRP's major errands: planning to seek an optimal way on a map from a starting point to a destination. We strive to achieve a GIS-based transport system that provides the easiest, fastest, shortest route to reach the hub. In this paper, we discuss the description of the different route planning algorithms and then explain their efficiency comparison and analysis when Municipal Corporations implement them throughout the existing road network for use in the waste management framework. Along with Haversine Formula, we choose Dijkstra, the most well-known shortest path algorithm and Travelling Salesman Problem.

## Smart City Driven by AI and Data Mining: The Need of Urbanization

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**Abstract.** In the modern world of urbanization, the needs of any smart city are to manage the various important wheels of the city like water & electricity, urban transportation and traffic system, pragmatic approach to manage the solid waste, centralized management of information, better disaster management for the city, control over crime, an active emergency response system, renovating the heritage monuments and making the city beautiful etc. for the people living in the city. The city authorities are engaged to make their city smart by means of implementing different solutions vide different schemes of the Central or State Government or of combined effort, integrating solutions and generated data which is huge can be utilized to discover the gap, improve operation and services for citizens of the city. This research paper highlights the use of artificial intelligence (AI) and data mining in implementing the sustainable solutions for a smart city.

## Development of Android Applications and Its Security

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**Abstract.** Smartphones have gotten to be a major portion of a human's life. These days versatile applications are playing a major part in numerous zones such as keeping money, social organizing, money-related apps, and amusement, and so on. For each desktop or web application, a substitute portable app is accessible. With fair single press number of versatile apps are accessible from Google's play advertise. With this tremendous number of applications, security is a critical issue. This investigative article talks about the security of the applications and the malevolent apps that will influence or spill delicate information such as Worldwide Portable gear Character Number (IMEI) of gadget, credit or charge card data, area data, and so on. As the android showcase is developing, security hazard has expanded and, in this way, a center ought to be given to security.

## Smart COVID simulation App for tracking of area-wise COVID patients: Aware of number of patients while moving on the places

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**Abstract.** In modern days, people are eager to see everything on their mobiles through the usage of apps. In the present situation, the user supposed would like to check the count of COVID patients while the gadget in which the app is installed is moving on. There are certain specific option user has to choose in order to see the count details over the app. As the place changes, the details of the place which is in the circle of the cell tower would update the count of COVID patients. This kind of work is done with the help of an online cloud as well as an in-built service GPS module. Dynamically, the user moves, the switching of place is also done and also updates the counting of COVID patient details. The aggregate functions are performed and are customizable. The results are produced based on the region level chosen by the user. In the future, any unknown disease would be entered, this kind of app would display the count and statistics of that infected.

## Smart Intelligent drone for painting using IoT: An automated approach for efficient painting

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**Abstract.** There are many occasions there few people may die because of lack of efficient resources, lack of technology, and dependent more on human efforts when painting for high buildings and high temple arches. Whenever the high buildings and temples arches need to be coloring, they consume more time and a greater number of labor to complete it. The finishing of the given task depends on many external factors. To be independent of many external factors, a smart drone with loaded colors is assigned and loads the texture that is expected as output. As the intelligence is loaded to the drone as well as the specific sensors are embedded to it in order to notify the information about the color's deficiency is detected, any resource to be required to complete the given task according to the given texture, any accidental collisions also notified and be a safeguard, and etc. The output of this study is an array that allows analysis on how many are identically done using SSIM measure. The major advantages are manpower is becoming almost NIL while been painting; the time consumed for the task given is to be completed in less time. The accuracies and their performances are measured and are depicted in the results when comparing this approach against the traditional and semi-automated approaches.

## Auto-Guide for caroms playing using IoT

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**Abstract.** The playing of the caroms manually or by computer environment would not be sent percentage accurate. In order to get sent out of sent results, IOT simulator is created over the carom board with audio as a aid. This proposed system integrates manual approach with simulated approach in order to achieve the 100% accuracies. There are certain situations where this system gives free hand to the player when is there is no guaranty of result. The proposed system has many scenarios which are trained with accurate results; such successful scenarios would yield to accurate results. In a total of player turns, this system completes the rounds in less time with the support of the players co-ordination compared to manual approach. The experience of this proposed system is extra-ordinary and result self-satisfaction. The predefined recorded set of successful scenarios are helpful in giving the guidance to the player, that would help to complete the board with efficient expected results than the results of manual or other existing approaches. The player's side-line border is fixed with each programmed sensor, which directs which coin if hits, would be successfully fallen. The factors considered here performance and accuracy, which makes the system more effective using IOT and specific machine learning technique.

## Intelligent Process Automation for Detecting Unauthorized Entry by Actors in IoT Imbedded Enterprise Setting

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**Abstract.** IOT shall be facilitating visualizing and identifying people who consciously / or by accident enters in to restricted parts of enterprises, which spreads over large land mass. The paper executes detailed study of the concept and construct of robotic process automation in the overall system design. The central theme of the problem-solving strategy is revolving around deploying IOT enabled devices in a structured layout to offer a solution which is 100% reliable, cost effective and higher longevity. One of the initial solution buildings was based on the use of audio-visual technique to see the unauthorized entry and subsequently document the complete event in a quasi-judicial framework. Another procedure involves providing communication between the authorized user and the person attempted the violation of existing protocols of the Enterprise. The paper envisages authenticating the newly enrolled personnel's remotely and instantaneously by capturing person's biometric markers and modifying the database which controls the entry. Further the paper also delves into providing safeguard from fire and gas leakage using the IOT enabled smoke / gas sensors.



## Machine learning for Speech Recognition

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**Abstract.** Machine learning paradigms that are used in automatic speech recognition (ASR) have been improved in the past decade. The improvement in speech recognition has been developed to help make the technology more efficient by dealing with various challenges affecting speech recognition such as speaker identification, capitalization, correct formatting, domain-specific terminology, background noise, the timing of words, and punctuation placement. Some other issues that have come up in speech recognition include data security and privacy, deployment, and language coverage. Any speech recognition system must have a noise removal feature to perform in the best way possible. This paper gives a brief about the machine learning techniques that can be used in speech recognition. A better understanding of the models will help understand the systems, and it may help improve the technology even further for the benefit of society.

## Secured Quantum Key Distribution Encircling Profuse Attacks and Countermeasures

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**Abstract.** To enhance security in today's computerised environment, communication must go above the boundaries of protocols. On the one extreme, improvements in encryption technology have been achieved, while the integrity of traditional techniques has indeed been repeatedly violated on another. In an on-line shopping, financial activity, or exchanging message communication via networks, safe transmission or activity should be considered at all times. The traditional cryptography's integrity is frequently reliant on computational limitations. The safety of the RSA system, one of most frequently used public-key encryption technique, is predicated on factoring's claimed difficulty. As a result, traditional encryption is followed more by possibility of unanticipated developments may be hacked or attacked in quantum code-breaking technology and techniques. In the proposed system of quantum key distribution the Trojan horse attack and time-shift attack are discussed. Quantum Key Distribution (QKD) is often recognized as a way to provide encrypted systems, or communication services that assure communication security and reliability. Algorithms based on the concepts of Quantum Key Distribution have showed promise in the pursuit for a higher security approach. So the proposed Quantum key distribution (QKD), the best aspect of quantum cryptography, decides to make cryptography unconditionally secure in communication of the networks. This suggested system also addresses quantum key distribution protocols in the context of significant network loss, as well as different threats and counter measures that are taken into concern. They produce a safe key by using traditional post-processing techniques like error checking and safety amplification. By using protocols, these keys can be utilized for making transmission completely trustworthy.

# ANALYSIS OF ROAD ACCIDENTS PREDICTION AND INTERPRETATION USING KNN CLASSIFICATION MODEL

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**Abstract.** Roadway accidents are very common and cause a great threat to developing and developed countries. Some basic knowledge is very important for everyone because safety of road accident and its prediction is more important in present days. Most of the variables influence the frequent accidents and these are as road features, weather conditions, type of accident, road condition. These parameters or influential components are used in selecting the effective model for evaluating the accident reasons. This paper presents a model system for analysis of road accidents prediction and interpretation using KNN classification model. By using this described method, the best and effective performance of the road accident prediction model and their reasons is discovered with K-nearest neighbor classification. By the comparative analysis of described method with the previous methods like logistic regression (LR) and Naïve bayes (NB). According to the performance parameters it can be clear that best model of road accident prediction is discovered. Therefore the government is takes the suggestive results from the model and improves the road safety measurements.

## An Overview of Efficient Regression Testing Prioritization Techniques Based on Genetic Algorithm

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**Abstract.** Testing is crucial in delivering a bug-free application to the client. Retesting the application whether there is a modification in different functionalities of the application when there is a code change is called regression testing. It is discovered to be expensive as it should be introduced after every code change. Among the numerous strategies existing for regression testing, reordering the test cases through prioritization, and just the low prioritized test cases are ignored without executing which saves cost, and time. The fault detection rate is found to be more for search-based techniques that apply genetic algorithms. Multi-Objective search-based prioritization was proved for its better performance when compared to the single objective genetic algorithms. Hence this paper reviews and analyze the multi-objective search algorithms and it is subjected to improvements. The review proves that genetic algorithms when integrated along with an efficient approach yield a better result compared to other prioritization algorithms.

## Impact of Dispersion Schemes and Sensing Models on Performance of Wireless Sensor Networks

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**Abstract.** With a view to assort the difficult tasks in distinct domains of pharmaceutical, technical, horticultural, WSNs are spreading speedily. In WSNs the remarkably practical and novel research domains coverage and dispersion schemes. In WSNs dispersion schemes precisely control the functioning of the networks. In disorderly dispersion employment of enormous amount of sensors mended the authenticity and scalability. For how much duration a physical area is supervised by sensors is known as coverage. For trespassers investigation in conserved or sensitive regions barrier coverage is primly measured. In WSNs recent research concentrates on coverage, connectivity, dispersion schemes, localization and power saving methods. Therefore this paper presents an advanced analysis of WSNs depending upon distinct aspects such as count of sensors, dispersion schemes, sensing range models.

## Path Segmentation for Visually Impaired People Using U-Net Architecture

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**Abstract.** According to WHO, at least 2.2 billion people are suffering from some type of visual Impairment and the number is rising continuously. So, the research to assist the visually impaired person is gaining much importance nowadays. So far, there are many assisting methods like white cane, guide dog and several ETA (Electronic Travel Assist) but they all come with various limitations. To overcome these limitations, we have proposed an assistance system to help the visually impaired person in low structured environment. The system will capture the images from the low structured environment with a camera. The image will be processed using a GPU at backend which in turn segment the path from the image with the help of artificial neural network and will provide the appropriate feedback for the visually impaired person. This paper will present the segmentation of the traversing path in the captured low structured environment images using the artificial neural network. A dataset is formed and UNET architecture is evaluated. The optimized architecture is managed to segment the image with the IOU score of 0.9012 and can also perform real time segmentation with a frame rate.

## Segmentation of Sidewalk for Visually Impaired using Convolutional network U-Net

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**Abstract.** Image segmentation can play the significant role in helping the Visually Impaired people to walk freely. We are proposing Image segmentation on our custom dataset of tactile paving surface or blind sidewalk. The underlying model for the image segmentation is U-Net. We have used IoU (Intersection over union) as a metric to know how our model is performing. We have achieved IoU score of 0.9391.

## A research perspective of VANET applications: A review

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**Abstract.** There is a need to develop an Intelligent Transport System (ITS) that can manage the traffic flow without causing any issues. An increasing number of vehicles, with a variable network density, results in difficulty for the development of ITS. Vehicular Adhoc Network (VANETs) make it possible to communicate the information among the vehicles by using roadside units deployed along with the roadsides, application unit, and onboard unit deployed within the vehicle. By creating a virtual link between the vehicles, it will be easy to make communication possible among the vehicles. It would help the transportation system to communicate all informational messages among the vehicles. VANETs are included in Sustainable Goals by the US government, it is also considered as a challenging goal for India as well. This paper presents a survey on the basics of VANET, its components, communication among vehicles, characteristics, and applications classified based on the safety and comfort of the traveler.

## Cloud based COVID-19 Analysis and Future Pandemics Prediction using IoE

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**Abstract.** Each zone could be very well investigated and ability packages, social and financial affects, and limitations to mass rehabilitation are discussed in greater detail. It describes the demanding situations and opportunities for IoE framework solutions inside the post-COVID-19 generation. The COVID-19 epidemic has furnished a far-wanted check of IoE-stimulated frameworks and answers. IoE solutions together with a ways flung fitness monitoring and phone tracking have supplied the guide of authorities to successfully manage to unfold the corona contamination. The principle contribution of this compare paper is the in-intensity analysis and segmentation of vicinity-unique IoE technology, which have the potential to be remarkable applications inside the new present day. So far, privacy worries and the protection of IoE applications are thoroughly analyzed with rising standards and the code for multitasking practices is likewise being mentioned.

## Cognitive Study For Online Education in COVID Using Python

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**Abstract.** This paper highlights the impact on education due to the corona virus/COVID 2019 crisis across the world. Over 100 million students in India will be phasing out this issue from 2019 onwards. The impact of this pandemic is not only on education but even on all sectors of the world. The enforced lockdown is having a bad effect on the students lives. Due to the pandemic, students as well as educational institutions have to attain technology in the education sector. This paper is going to use the online survey method to gather the responses of some 20 schools and 10 college students from different states in India by using self-developed questionnaires to analyse the effect of online based learning on students. We compare the different surveys of other countries to find out what major steps help in the education sector of those countries. Using Python discovered that 90% of students are currently dealing with health issues, and 70% are not receiving financial assistance. Only 30% of students are found proficient in digital skills, and many of them feel a lack of teacher-student interaction. We found some negative and positive impacts of COVID-19 on students. Also, we are suggesting some solutions for the educational sector to opt for ICT at a low cost.

## IOT SECURITY: RECENT TRENDS AND CHALLENGES

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**Abstract.** The use of Internet of Things (IoT) devices is increasing day by day along with the increased use of advanced technologies in almost every field. IoT provides technologies like Wireless Sensor Networks (WSNs) and Radio Frequency Identification (RFID) which are used in several applications like forest fires, home automation, military equipments, traffic signals, medical sciences, agriculture, etc. Large amount of information is being obtained by the sensors and then sent to data centers through the transceivers for analysis and decision making purposes. Based on these decisions, the actuators perform a particular tasks based on the applications. This large amount of data can be used by a third party for malicious purposes, so there is a need for information security almost at every level of IoT. IoT is the kind of technology that involves several fields of computer science at step. With the usage of multiple technologies like Artificial Intelligence, Machine Learning, Data Mining methods, etc, there is a need to provide proper security to the IoT system also. Several layers used in the IoT architecture need to be protected. Hence, there is a need to make a robust system in order to deal with the existing vulnerabilities, threats, attacks, privacy and security challenges existing in IoT system. This paper discusses the recent trends in the IoT architecture along with the acknowledging the threats present in different architecture layers. Along with this, the security threats and challenges are also discussed.

## Comparative Analysis of Machine Learning Classification Algorithms for Predictive Models using WEKA

Siddhartha Roy, Runa Ganguli

**Abstract.** The world is becoming progressively more dependent on technology. Artificial Intelligence (AI), part of such technology is the simulation and emulation of human intelligence by machine and computer systems. Machine learning, one of the most significant branches of AI, makes it possible for machines to learn from experience and historical data using simple and complex algorithms. Predictive algorithm is a scientific idea of empirically establishing a relationship between the historical set of data which can then be used to make future decision in an attempt to solve some real-life problems. The action of predictive algorithm on big data results into predictive modelling which has been applied by various researchers to solve numerous problems including prediction of weather condition, rate of disease spread, birth rate, death rate, rate of road accident and in population prediction too. In this paper, we have presented a comparative analysis on the performance of four major Machine Learning classification algorithms namely K-nearest neighbor, Naïve Bayes, Random Forest and SVM on three case studies of predictive modelling using WEKA tool. The case studies selected for this paper are Station-wise Rainfall Prediction, Life-time of a Car Prediction and Detection of Breast Cancer.



## HYBRID SECURITY FOR DATA IN CLOUD COMPUTING: A REVIEW

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**Abstract.** Cloud computing is the most current technology to emerge in the last several decades. It is a great platform for the users to share data or applications on remote server that can be processed and accessed through internet. Users are always concerned with security issues which are really challenging in cloud computing because many customers were sharing the same cloud. The cloud service provider must ensure that the sensitive information in the cloud is secured using the latest security techniques to protect the data, applications and infrastructure associated with the cloud. This study aims in discussing, various cloud security hazards and different hybrid cryptosystem used for security. A new method is proposed for high security which includes Blowfish symmetric algorithm and RSA asymmetric algorithm for data privacy along with Password-Based Key Derivation Function 2 (PBKDF2) algorithm for strong password security.

## COVID-19 Disease Classification Model Using Deep Dense Convolutional Neural Networks

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**Abstract.** Preventing the transmission of COVID-19 necessitates diagnosis and identification. Researchers have developed algorithms to detect the presence of COVID-19 in X-ray and CT scans and images. These, although methodologies produce skewed data and incorrect disease detection. So, in the case of COVID-19 forecasting utilizing CT scans in an IoT setting, the current study paper established an Oppositional-based deep dense convolutional neural network (DDCNN) and chimp optimization algorithm. The framework proposed is divided into two stages: preprocessing and estimation. Previously, a CT scan pictures generated from anticipated COVID-19 are acquired utilizing IoT devices from an open-source system. After that, the photos are preprocessed with a Gaussian function. A Gaussian filter can be used to remove undesirable noise from CT scan pictures that have been obtained. The preprocessed photos are then transmitted to the prediction process. DDCNN is applied to the images pre-processed in this step. The recommended classifier is designed to be as efficient as possible using the Oppositional-based Chimp Optimization Algorithm (OCO). This approach is used to choose the best classifier parameters under consideration. Furthermore, the suggested method is applied to forecast COVID-19 and categorizes the findings as COVID-19 or non-COVID-19. The proposed technique was used in python, and results were assessed using statistical analysis. CNN-EPO and CNN-FA were compared to the new method. The results proved that the proposed model was optimal.

## Forecasting COVID-19 Confirmed Cases in China Using an Optimization Method

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**Abstract.** COVID-19 is a brand-new coronavirus, was found in Wuhan, China, in December 2019 and has since spread to 24 additional nations as well as numerous locations in China. The number of confirmed cases continues to rise every day, reaching 34,598 on February 8, 2021. We present our findings a new method was used in this investigation, predictive framework for such number of reported COVID-19 cases in the China. During the next 10 days, predicated on recently known cases in China. The suggested an upgraded adaptable neuro-fuzzy powerful instruments (ANFIS) with an updated floral modeling is used in this model. The salp swarm algorithm (SSA) was used to implement the pollination algorithm (FPA). Generally, SSA is used to enhance FPA so order to minimize its shortcomings. The fundamental theme of the essay is FPASSA-ANFIS seems to be a proposed paradigm of improving ANFIS effectiveness through determining FPASSA was used to determine the ANFIS specifications. The World is also used to analyze the FPASSA-ANFIS model. Statistical figures from the World Health Organization (WHO) on the COVID-19 pandemic for forecast the cases reported These following are indeed the cases for the next 10 days. Most specifically, the FPASSA-ANFIS model in comparison to such a number of other models, but it outperformed them in term of computing time, Root Mean Squared Error (RMSE), and Mean Absolute Percentage (MAP). Researchers also put the suggested model to the tests utilizing two distinct datasets of week pandemic confirmed cases from two or more countries: the United States and China. These results also indicated incredible performance.

## Issues of commodity market and trade finance in India and its solutions using blockchain technology

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**Abstract.** A commodity market is a marketplace where different primary products and raw materials like precise metals, base metals, energy products, and agriculture products get traded. The entire trading process is managed by different governing agencies like MCX, NCDEX, NMCE, ICEX, etc. All these exchanges manage different types of commodities like future commodity trading as well as option commodity trading. For the economies of developing countries, the commodities sector is very important, and it is estimated that more than 100 developing countries rely on primary commodities for their export earnings. Currently, commodity and finance trading is facing different problems like getting new commodities, attracting small participants, fewer commodities of agriculture products, managing a huge set of documentations, inefficiency due to physical marketplace, the collaboration of all stakeholders, etc. These problems many times increase rates of commodities and surveys reported that commodity price rise can bump up inflation by 1%. This paper suggested solutions to these problems using a blockchain distributed ledger, which helps to create a network of trust and digitize every product connected to the trade and finance industry using Ethereum blockchain and smart contracts.

## Activation Functions for Analysis of Skin Lesion and Melanoma Cancer detection

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**Abstract.** Skin cancer is the most common occurred cancer on the body which is time-consuming and tedious. Detection of this cancer at early stage has a high effect on the disease treatment. Skin cancers are defined as either malignant or benign cells. With the advancements in deep learning algorithms in image processing and computer vision, there was a great evolution in medical image analysis especially for the classification of melanoma from skin cancer diagnosis. A convolution layer with activation function will move to next layer. The activation function plays a prominent role in the deep neural networks. On the proposed transfer learning method various activation function are implemented to check the model accuracy and to classify the melanoma. For experimental purpose we use the datasets collected from various patients towards melanoma detection.

## AUTOMATED REAL-TIME FACE DETECTION AND GENERATED MAIL SYSTEM FOR BORDER SECURITY

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**Abstract.** This paper focus on face recognition and automatic mail generated system for observations by using a solitary camera. The application is created for detection and capturing the face, which can be applicable in surveillance system at border gateway. The camera is fixed for human face identification. A framework that perceives human information is handled in a second and an email alert is produced for security reasons. The key regions for examination of face detection have taken as consideration in scenario. After applying in real time state Viola-Jones Algorithm is used for face detection from different angles. The better pixels based image is used for sending emails. The performance has been checked and analyzed after repeating iterations of experiments through simulation.

## SMART CROP PREDICTION AND ASSISTANCE

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**Abstract.** Agriculture is the backbone of the economy of our country. Agriculture and its allied work is undoubtedly the largest livelihood provider to the vast rural people. Modern agronomy, plant breeding, pre-analysis of weather condition and soil conditions, agro-chemicals such as pesticides and fertilizers, and technological developments like using IoT devices for collecting data, usage of Machine Learning for the prediction, etc have sharply increased crop yields. Climate conditions plays very important role for the growth of any crop. Agrochemicals can enhance the crop growth when used in proper amount and right composition. Every year there are losses in many crops cultivation due to lack of climatic condition or soil nutrition. Internet of Things (IoT) is the technology which helps to communicate with things like systems, machines or static objects around in various ways. IoT technology can be used to interact with real time facts and figures. Machine learning (ML)

is an application provides the capability to learn automatically to the system. It is a part of Artificial Intelligence (AI). ML helps in improvement from experience without being explicitly programmed/ modified. Machine learning in agriculture can be used to improve the productivity and quality of the crops for the betterment of the society.

## A Review of Time, Frequency and Hybrid Domain Features in Pattern Recognition Techniques

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**Abstract.** The treatment and rehabilitation of individuals with motor disabilities is one of the key application areas. Therefore in biomedical engineering, the detection of EMG signals using efficient and advanced methodologies is becoming a critical requirement. Clinical diagnosis and biomedical applications are the key reasons for EMG signal analysis's popularity. Modern signal processing techniques, which can provide a time-frequency representation, are one of the possible solutions for automated EMG analysis. Furthermore, EMG-based prosthetic control supports varying levels of freedom operations, enabling amputees to operate the device intuitively. This paper highlights a detailed comparison amongst the data acquisition methods, features extracted like time-domain, frequency-domain and time-frequency domain by deploying different feature extraction techniques, distinct machine learning and deep learning classification methods and their respective accuracy for decoding the various limb movements done by the normal and disabled subjects.

## Early Parkinson Disease Detection Using Audio Signal Processing

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**Abstract.** Parkinson disease is a long terms degenerative disorder and it has been found in the studies that a person diagnosed with PD suffers several speech impairments and this problem in patients can be used to differentiate them from a healthy person. In this paper different machine learning algorithms have been used such as, Random Forest Classifier, Xgb Classifier, Naive-Bayes, K-nn, Decision Tree Classifier. The data set used in this paper was divided in the ratio of 70:30, 70 for training dataset and 30 for testing dataset and then hyperparameter tuning was done to select the best of the hyperparameters to be used for the models and to get good accuracies from implemented algorithms and for the evaluation of model accuracies and f1-score has been used to evaluate the models. The XgbClassifier gave the best accuracy of 96.61% and f-1 score of 98.00.

## Unveiling the Success behind Tesla's Digital Marketing Strategy

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**Abstract.** Tesla is an American Automobile company founded in 2003 and has been an ever-growing brand in terms of its revenues and sales since its early days of inception in the market. The entire marketing strategy of Tesla is done digitally and very less or almost negligible amount is spent on traditional marketing methods. The entire promotion of the brand and its various products is done through the various online social media platforms like Facebook, Twitter, Instagram and You Tube. In fact, 70% of the company's sales are done online. There are significant differences in the designing and the availability of the retail outlets as compared to the other big brands in the industry. This paper presents a detailed study of unique and innovative marketing strategies of Tesla for making its presence in the market.

## Supervised Learning Techniques for Sentiment Analysis

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**Abstract.** Data mining implies the application of techniques of obtaining useful knowledge from a huge data. Another term for data mining is Knowledge Discovery from Data. For the same, various data mining technologies are available such as statistics (lay the foundation of data mining), Artificial Intelligence (applying human thoughts like processing of data) and Machine Learning (union of statistics and artificial intelligence). In this research work, authors employ natural language processing in order to perform sentiment analysis using various feature extraction techniques of NLP. Sentiment analysis is especially important to gain users' feedback and opinion about products. In this paper, authors perform sentiment analysis of twitter data. Each data point (tweets in considered case) will be classified as "positive tweet" or "negative tweet". For this classification, six different techniques i.e., Information Gain, Gini Index, Naive Bayes, K-nearest neighbor, Random Forest, and Gradient Boost are used. In the end, classification through all these techniques are analyzed and a comparative analysis is made based upon accuracy, precision, recall, and f1 score. Experimental results suggest that random forest aces the current analysis by yielding an accuracy of 97%.

## Cataract Detection on Ocular Fundus Images using Machine Learning

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**Abstract.** Cataract is a very common condition affecting the elderly. The onset of cataract is slow and is therefore not detected until it starts to obstruct the vision of the affected patient. One way to detect cataract is



through study of the ocular fundus images. Machine learning techniques trained on available datasets offer effective and fast methods of detecting abnormalities in ocular fundus and can be used for identifying patients affected by cataract. In this paper, we trained and tested various machine learning techniques in order to perform binary classification for cataract detection on ocular fundus images. We implemented techniques such as support vector machines, random forest, decision tree, logistic regression, naïve bayes, k nearest neighbors, XGBoost, light gradient boosting and voting classifier. Improved results were obtained through light gradient boosting.

## BLOCKCHAIN ENABLED INTERNET-OF-VEHICLES ON DISTRIBUTED STORAGE

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**Abstract.** The world today is witnessing a paradigm shift attributed to expedited penetration of new technologies in the ecosystem of routine human lives. One such domain, soon to be impacted is the way traffic and transportation system is organized today. The futurity of transport will be completely different from what we have today. It's going to be based on Internet-of-Vehicles. Still in evolving times though, the envisaged growth of the Internet-of-Vehicles has thrown multiple challenges of ensuring seamless, secure, robust exchange of information between devices. These challenges majorly include large data sets storage, real time intelligent management and information security for the entire eco system of these connected vehicles. The Internet-of-Vehicles being proliferated further by autonomous vehicles in the not so distant future will add to the existing challenges. Blockchain technology, majorly associated with cryptocurrencies, has recently envisaged a range of benefits vide implementation across multiple domains, by offering its inbuilt characteristics including decentralized architecture, enhanced security, immutable and transparency etc. This paper explores the advantageous connect between smart contracts and Internet-of-Vehicles and need of distributed storage to redefine trust enhancement, security and high storage generated amongst devices. It proposes architecture based on smart contracts while also simulating a limited part with Internet-of-Vehicles concluding with discussion on challenges ahead.

## A Future Perspectives on Fingerprint Liveness Detection Requirements and Understanding Real Threats in Open Set Approaches to Presentation Attack Detection

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**Abstract.** In the last few years, researchers are reporting a gap in the requirements of fingerprint biometric systems and their implementation which is evident from increased personal identity theft. However, authentication using fingerprint biometrics is in wide use in a variety of domain applications. The fair uses of biometric systems are questionable even now in conventional uses, frequent incidences are available which report security and privacy risk along with other problems. At the time of designing of biometric system, security and privacy is the main key. For example, unauthorized person access in a biometric system is possible with spoof samples generated from a latent fingerprint image. In this paper, we discuss problems included in the biometric system i.e., performance, security, bias, interpretability, and privacy. These problems help to access the real threat through a critical review of LivDet 2017, 2019, and 2021 competition. It is observed that the accuracy of the system is increased in the past decades but the error rate is still not zero, false-negative error detection is a challenging task and it is difficult to handle in generalized cases. The various performance measures are showing that current solutions need a re-look to operate in an open-set environment. The literature work presented here shows current trends and practices that evolved during the last five years. This work proposes a simple architecture for fingerprint presentation attack detection using Naturalness Image Quality Evaluator (NIQE) model and Perception-based Image Quality Evaluator (PIQE) no-reference image quality score. To

handle the generalized cases, this proposal propound a person-specific liveness model for each individual which is independent of spoof sample training requirements.

## OPTIMAL SELECTION OF CLOUD SERVICE PROVIDER USING MCDM APPROACH

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**Abstract.** Cloud Computing Services has become progressively much desired since it gives the user a variety of adapting features, systematic and genuine computational Services. As Cloud Services are very popular among users now a day, it grows very fast and almost many IT Service Providers engage to give services with good quality and well-structured which would adapt the features actually required by the users'. As there is a vast range of Cloud Provider, choosing the best provider had become a great challenge for Cloud users. Multiple criteria has to be analysed by the user before selecting the best Cloud Service Provider (CSP) which is an complex problem. Thus, the problem comes under Multi Criteria Decision Making(MCDM) problem where the MCDM handles the data in a systematic way, so that the user gets the best provider. This study incorporates different methods of MCDM techniques which would rank the Cloud Service Providers(CSPs) according to the user specifications. The techniques includes Weighted Sum Model (WSM), Weighted Product Model(WPM), Technique for Order of Preference by Similarity to Ideal Solution(TOPSIS) and Evaluation Based on Distance form Average Solution(EDAS). Thus, the ranking will help in giving out the efficient Cloud Service Provider for the customers' specification.

## Plant Species Recognition from Leaf-vein Structures using ResNets

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**Abstract.** Leaf-vein structures are equivalent to fingerprints for a plant species. Each species of plant has a unique vein structure and this structure identifies species. In this paper, we have used a leaf vein dataset that contains 64x64 pixel green-channel center-focused images for four species, two from monocotyledon and the other two from dicotyledon categories. We have trained two state-of-the-art Residual Neural Network (ResNet) models with a recently introduced leaf-vein image dataset. We also introduced two extended versions of those models. Our study shows that ResNets are efficient in recognizing vein structures from those partial leaf-vein images with 78.98% accuracy for ResNet50 and 81.63% accuracy for ResNet101. Also, our proposed extended versions of the ResNets prove to be more efficient than the existing ones with around 82% accuracy for DenseResNet50 and approximately 83% accuracy for DenseResNet101 models.

## Plant-species Classification from Bark Texture using Hybrid Network and Transfer Learning

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**Abstract.** Every plant species has unique characteristics for leaf shape, vein structure, bark texture, fruit shape, or others. These characteristics identify plant species distinctly. In this paper, we have classified plant species from two bark image datasets, Bark-101 and Trunk12. We developed residual learning-based extended DenseNet201, where the DenseNet201 part of the network was pre-trained with the ImageNet dataset. The proposed extended part of the model is comprised of 14 layers with one residual block. We then compared the performances against benchmark results. For the Bark-101 dataset, our hybrid model achieved 53.88%. In the case of the Trunk12 dataset, we applied 10-folds cross-validation and our model gained 96.56% on average. This research will significantly help plant researchers and others to classify particular plants easily.

## Tomato Leaf Disease Recognition with Deep Transfer Learning

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**Abstract.** Transfer learning has introduced us to a new aspect of sensitive image classification tasks, such as disease recognition from both flora and fauna. It enables us to achieve significant performance faster and more effectively. On the other hand, plant-disease recognition is undoubtedly important from nutritional and financial aspects. In this manuscript, we have deployed ImageNet pre-trained ResNet152V2 along with a custom 10-layers Densely connected neural network for automatic disease classification from 10 types of tomato leaf images, 9 diseased classes and healthy class. Our approach demonstrates significant performance against other recent works on tomato leaf disease classification. Our model performed well with almost 97% accuracy on the testing set.

## IoT Enabled Automated analysis and Classification of COVID-19 disease in Lungs CT images based on Edge Computing Environment

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**Abstract.** A new coronavirus outbreak (COVID-19) has created a dire scenario around the world, making it one of the most acute and severe diseases to strike in the last century. Daily, the number of people infected with COVID-19 increases across the globe. Despite the fact that there are no vaccines for this pandemic, deep learning techniques have shown to be a helpful addition to the arsenal of diagnostic tools available to clinicians. IoT-enabled edge computing environments necessitate the use of the federated deep learning (FDL-COVID) COVID-19 detection model. First, the FDL-COVID method allows IoT devices to collect patient data, and secondly, using SqueezeNet architecture, the DL model is developed. The encrypted variables are uploaded to the cloud server by the IoT devices, and the SqueezeNet model is used to perform FL on the major variables in order to generate a global cloud model. As a result, a Glowworm Swarm Optimization (GSO) algorithm-based hyperparameter optimizer is applied to the SqueezeNet model's hyperparameter selection. The CXR dataset was used to run a large number of simulations on the SqueezeNet model, and the results were analyzed using a variety of metrics to create a global cloud model. Additionally, the SqueezeNet architecture's hyperparameters are optimized using the glowworm swarm optimization (GSO) technique. The benchmark CXR dataset was used to conduct a wide range of experiments, the results of which were analyzed using several metrics. The experimental results showed that the FDLCOVID technique outperformed the other methods in terms of performance.

## An Exploration of Machine Learning and Deep Learning Based Diabetes Prediction Techniques

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**Abstract.** Diabetes is now one of the world's leading chronic diseases, affecting the middle-aged and elderly in most cases. This disease will gradually transform a person into death. There is an imbalance in blood glucose with the consequence of this disease that prompts the production of lower insulin. Medical science for the treatment of this disease is now advancing steadily. In addition to this, research focused on Artificial Intelligence (AI) is now advancing to define the stage of diabetes so that steps can be taken by everyone. A state-of-the-art analysis of various techniques for predicting diabetes is seen in this paper. For the last decade, several techniques based on Machine Learning (ML) and Deep Learning (DL) have been focusing on diabetes prediction. This research shows a summary of the published literature on the prediction of diabetes in the last six years. A recommendation system for observing the health of a patient through a web portal is proposed at the end of this article.

## Machine Learning Based Smart Tourist Support System (SmartGuide)

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**Abstract.** In order to conquer global tourism, Sri Lanka needs to adapt to modern trends in order to provide a better service to travelers. The tourism industry has become one of the fastest-growing industries in the world's revenue generation. The ultimate goal of our project is to support the betterment of the tourism industry by suggesting best locations for users using preferences such as age group, gender, religion, country, traveled month, travel group type(s), food preferences, suggesting best routes and transportation methods for travelers, planning trips according to traveler's preferences, customizing and managing time throughout the journey. Moreover, the proposed system provides the opportunity for hoteliers and other related service providers to customize their business to suit the needs of tourists. We obtained past visited data set from Sri Lankan Tourism Board and also we collected data from tourists using a google survey via a tourism agency. In this study, we propose a classification of AI models to predict the best locations and best transportation methods. The classification model selected for this study is Random Forest, which has exhibited an accuracy level of 90% in location prediction and 86% in transportation method prediction. The other one is exponential smoothing time series models, which have shown an accuracy of 84.74% level. To plan the trip optimistically, an algorithm that generates trip plans according to user preferences is implemented.

## Review of Toolkit to build Automatic Speech Recognition Models

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**Abstract.** Speech is one of the most significant types of communication between human beings. It is beginning to be a preferred means for communication between machines and humans. The mechanism of transforming human speech into its equivalent textual format is known as speech recognition. Various toolkits are being used to automate the process of speech to text conversion, and this process is referred to as Automatic Speech Recognition (ASR). The usage of the ASR system is becoming prevalent with the implementation of human-machine interaction. Numerous speech-based assistive systems are available today used in several different areas. This paper provides insight into the ASR domain and toolkit used in ASR system – HTK, CMU Sphinx, Kaldi, Julius with their comparative analysis in terms of Installation, ease of use and accuracy assessment.



## Loyalty Score Generation for Customers using Sentimental Analysis of Reviews in e-commerce

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**Abstract.** Presently, the existing systems use the star ratings of products as the quality factor, but ignore the tangible feedback. It is problematic since the star ratings may differ from the intensity of written feedback given by the user. This motivated authors to come up with the system that will use both ratings and reviews together. In this paper, the author has proposed a model in which sentimental score will be generated for the reviews given by the user by using sentimental analysis and shall derive the correlation between the ratings and sentimental score generated by analyzing the customer reviews. By doing the same for all the reviews given by the user, the model will assign a loyalty score automatically to the customer. This loyalty score can be used to build customer profile and also the sentimental score generated can be used to boost the products when the user applies a sort by ratings filter as the user will get to see not only the products that are having good ratings, but also the products that got better reviews along with it.

## Secure 6G Communication in Smart City Using Blockchain

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**Abstract.** The next-generation cellular network will aim to overcome the existing Fifth Generation (5G) networks' shortcomings. At the moment, academics and business are concentrating their efforts on the Sixth Generation (6G) network. This 6G technology is expected to be the next great game-changer in the telecommunications sector. Due to the outbreak of COVID'19, the entire globe has turned to virtual meetings and live video interactions in various fields as healthcare, business, and education. We explore the most recent viewpoints and future technology trends that are most likely to drive 6G in this paper. The incorporation of blockchain in 6G, will allow the network to efficiently monitor and manage resource consumption and sharing. We explore the potential of blockchain for sharing in 6G utilizing a variety of application scenarios in the smart city. To strengthen security and privacy in 6G networks, we introduce potential difficulties and solutions with various 6G technologies. In addition, we examine the security and privacy issues that may arise as a result of the current 6G standards and prospective 6G uses. Overall, our study aims to give insightful direction for future 6G security and privacy research.

## A Machine Learning Supervised Model To Detect Cyber Begging In Social Media

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**Abstract.** The misuse of social media leads many of the users to fall into crimes that they are not aware of it especially financial ones. Recently, cyber begging has grown significantly on social platforms, impacting users and actual beneficiaries. The effects of this threat are serious and harmful that could lead to financial crime charges. With the spread of social media in recent times, this threat has become a globally important issue due to the economic and security implications. Most of the researchers discussed different types of cybercrimes to discover them and develop solutions to them. However, the number of research that focuses on cyber-begging in social media is insufficient. In this paper, we used machine learning to automatically identify cyber-begging in social media. The proposed model identifies cyber-begging using the Naive Bayes (NB) classification algorithm by training and testing the classifier using a real dataset collected from Twitter.

## Privacy Conserving Using Fuzzy Approach and Blowfish Algorithm for Malicious Personal Identification

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**Abstract.** As we know that when we exchange data through the network, system need more security and approval. Generally crisp algorithms are used for extraction and identification of data. When we use crisp logic it is very complex and tedious work, so we recommend a fuzzy approach for data extraction. Security is the main part of data exchange. In this article, we have to discuss how fuzzy logic is used in Blowfish algorithm to secure communication. Multimodal Images uses the rules of the Fuzzy Logic Fuzzy Inference System to design a 64-bit Blowfish algorithm that increases security and improves performance. This algorithm helps protect data from unauthorized access and runs faster. Our proposed algorithm is designed using MATLAB R2017a. We also discussed the pros and cons of fuzzy and blowfish.

## Retinal Optical Coherence Tomography Classification using Deep Learning

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**Abstract.** The execution of medical decision-making or clinical diagnosis in medical or clinical imaging generally involves difficulties with reliability, robustness and interpretability of data. In this project, we set up an analytic and predictive system dependent on a deep learning technique for the screening of patients with treatable blinding retinal illnesses, specifically related to Choroidal Neovascularization (CNV), Diabetic Macular Edema, DRUSEN or Normal retina. We use the power of transfer learning in our neural network, which prepares our deep learning model to perform better on X-ray retinal images. When a dataset of optical coherence tomography(OCT) pictures are given to a model, we are able to exhibit results comparable to that of human specialists in characterizing and segregating age-related illnesses of the retina, especially corresponding to choroidal neovascularization, macular degeneration and diabetic macular edema. Transfer learning leverages the power of pre-trained weights and biases to allow a deep learning neural network to find better patterns and classify more efficiently. This system may assist in the conclusion and reference of treatable retinal diseases and eye-related conditions, consequently allowing early detection and treatment of illnesses, bettering medical treatment of patients.

## Social Engineering Attacks

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**Abstract.** We live in an Internet-based world, and our personal and professional lives are more intertwined. Systems of information technology (OS). These mechanisms are frequently subjected to public scrutiny. To avoid being hacked or infected with a virus, we are all on the lookout for the greatest antivirus and anti-spyware software. Install the program, yet the malware still exists. Our system has been hacked into. The most influential people Social Engineering is a type of system attack. These attacks aim to tricking individuals or businesses to perform acts that benefit the attackers or to provide them with sensitive information such as social security numbers, medical records, and passwords. Because it takes advantage of the inherent human desire to trust, social engineering is one of the most difficult problems in network security. This paper provides a comprehensive overview of social engineering attacks, including classifications, detection and prevention procedures.

## Predictive Analysis of Covid-19 Data using Two-Step Quantile Regression Method

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**Abstract.** In the year 2019, research community began with new challenge called novel corona virus disease (COVID-19) has opened up new challenges for the research community. From the report of the world's health organizations (WHO), the new virus COVID-2019 [2] causes dangerous illness to the concerned person and it spread to other peoples with huge rate thorough contact. Such kind of pandemic analysis needs efficient methods to predict data and also helped further to analyze such epidemic risks. These kind of analysis are used to handle and control the epidemic kind of diseases. Regression Analysis is kind of ML methods and is worked well to analyze such kind of epidemic data. The work in this paper, about analysis of COVID-19 data especially focused in the state of Andhra Pradesh. First, data collected from the website (i.e., <https://prsindia.org/>). Next, applied various regression techniques like linear, multi-linear and quantile regression for covid-19 data for the prediction of cases. Further extended work to derive penalized quantile results using lasso. The results shows that the Two Step Quantile Regression (TSQR) has been shown to be a better predictive method for predicting confirmed cases compared to linear and multi-linear regressions in terms of MSE, and R-Score parameters.

## A Novel Approach for Iris Recognition Model using Statistical Feature Techniques

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**Abstract.** Numerous researchers have proposed iris recognition systems that use various techniques for extracting features for accurate and dependable biometric authentication. This study proposes and implements a statistical feature extraction approach based on the correlation between neighbouring pixels. Image processing and enhancement methods are utilised to identify the iris. Statistical characteristics have been used to assess a system's performance. Experiments on the influence of a wide range of statistical characteristics have also been carried out. The studies' findings, which were based on a unique collection of statistical properties of iris scans, reveal a considerable improvement. A receiver operating characteristic curve is used to do the performance analysis.

## Automatic CAD System for Brain Diseases Classification using CNN-LSTM Model

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**Abstract.** Development portrayal is a troublesome investigation issue in the space of therapeutic science. The frontal cortex development is fundamentally fundamental and envisions a threat to life. We propose a novel and totally automated brain development portrayal CAD system using significant learning estimations. The proposed model involves steps like pre-planning, division, features planning, and portrayal. In division, we revolve around discovering the ROI of tainted regions using dynamic thresholding. We dealt with the pre-taken care of

MRI picture to the generous CNN model for modified features extraction using the pre-arranged ResNet50 model. The isolated components are moreover lessened using the Principal Component Analysis (PCA). We plan the Long Short-Term Memory (LSTM) classifier to vanquish the dissipating point issue. The vanishing point issue of neural association classifiers prompts request batches.

## Deep Learning Based Emotion Recognition using Supervised Learning

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**Abstract.** Facial emotion recognition using deep learning is getting lot of attention by the researchers in the past years. Since the images are non-linear and noisy in nature, it is very difficult to develop an intelligent system capable of higher accuracy to recognize facial emotion. In this research, we introduced an intelligent framework for facial emotion recognition that used deep learning for feature extraction and random forest for classification. The extracted features obtain from the deep learning are used further for the classification to identify different types of emotions. The results are obtained from the three publicly available datasets: AffectNet, CK+, and EMOTIC. We have also shown the effectiveness of our framework in comparison with the research where deep learning is used as feature extractor to recognize emotions. The results prove that the introduced technique can able to improve the emotion recognition rate on the different size datasets.

## Sentiment Analysis of user groups in an working Environment using CNN for Streaming Data Analysis

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**Abstract.** The domain of sentiment analysis is mainly concerned with observing the nature of text with positive, negative, and neutral effects in a given environment. It is also called the process of opinion mining in which the emotion behind the idea, service, or product completely signifies the nature of the environment as observed. The insights from this unorganized textual data can be evaluated along with the methods available in machine learning. This research work completely focuses on the mechanism of observing the project teams with a significant analysis in monitoring the percentage of happiness involved in executing a specified project. In addition to the collection of views from the different groups of employers, we have observed their nature through a webcam-enabled platform to best determine the work nature of team members. We have used CNN with the available streaming data and captured the nature of workers in a dignified environment. A set of statistical measures has been evaluated to best validate the proposed method which extracts sentiments for the observed data. Future work can be progressed with the extraction of organizational data rather than focusing on working teams in a given environment.

## A Short Review on Automatic Detection of Glaucoma using Fundus image

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**Abstract.** Among the eye diseases, glaucoma is considered the second leading disease all around the world that develops intraocular pressure and damages Optic Nerve Head (ONH) within the human eye, which causes vision loss. Early-stage diagnosis of glaucoma can provide various benefits using fundus images. This study introduces various types of glaucoma, their associated risk factors, and a short review of various methods used to identify glaucoma automatically. This review discusses various image processing and deep learning-based techniques in detail. In this review, in the image processing-based techniques section, a high emphasis is given to segmentation techniques used in handcrafted features extraction. However, features are extracted automatically in deep learning techniques, so high emphasis is given to various deep learning models and classifiers in the deep learning-based techniques section. This study briefly described the details about the publicly available datasets. The study also discussed the analysis of various medical features such as CDR, ISNT, NRR, RNFL, GRI, and performance metrics, namely sensitivity, specificity, and accuracy, used for glaucoma detection.

## Comprehensive Review of Learnable and Adaptive Recommendation Systems

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**Abstract.** Due to the dynamic and heterogeneous nature of the web, it is increasingly difficult for users to choose among large amounts of data. For this reason, the modelling of users and access to personalised information becomes essential. Recommendation systems stand out as systems that aim to provide the most appropriate and efficient services by offering personalised recommendations to users. Traditional recommendation systems provide suggestions to their users with static approaches and do not include user preferences that change over time in suggestion strategies. In this study, a comprehensive review and comparison of recommendation systems that can adaptively develop suggestion approaches according to changing user preferences and learn user preferences are presented.

## Study on Optimizing Feature Selection in Hate speech using Evolutionary Algorithms

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**Abstract.** Hate speech is an important problem while dealing with user-generated content on online social media platforms. The huge amount of data generated makes it nearly impossible to manually moderate hate speech content and take appropriate measures. In this paper, we utilize various optimisation algorithms to enhance the feature extraction and vectorization, of various techniques like TF-IDF, Word2Vec, and Bag of Words and appertain on the machine learning models for two-fold classification. We gauge and visualize the conclusion of the propounded methodology of the hate speech problem about Twitter tweets. We examine our suggested technique on three datasets; out of which two of the datasets were highly unbalanced and SMOTE was used for class balance. Our experiments indicate the random behavior of Particle Swarm Optimization and



Genetic Algorithm, and the decrease in accuracy when applied individually to the experiments. The results also indicate that the accuracy can be achieved back by applying Particle Swarm Optimization and Genetic Algorithm parallels, countering their random behavior.

## On-Device Emotional Intelligent IoT- based Framework for Mental Health Disorders

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**Abstract.** There has been a massive surge in mental health cases around the world post COVID-19 pandemic, which can be defined as an urgent and dangerous world health threat. According to pre-COVID-19 estimates, depression and anxiety alone has cost the economy over US\$ 1 trillion each year. Every dollar spent on evidence-based care for depression and anxiety results in a return of \$5 as per the research conducted by WHO [1]. Moreover, when a person is sick, they visit the doctor to perform some tests to determine a medical diagnosis. But when it comes to mental health, there is no test to determine the diagnoses, which makes mental health diagnosis challenging. The paper proposes on-device IoT framework to aid in the identification, assessment, treatment, and potentially alleviation of symptoms associated with mental health disorders. To determine and investigate the effectiveness of the the proposed system used in the paper for diagnosis, treatment, follow-up, and mental health enhancement, we will be using the Diagnostic and Statistical Manual of Mental Disorders 5 (DSM 5) [2], an authoritative reference used for defining and categorising mental health disorders. The proposed system will leverage the On-Devices ML capabilities to identify the symptoms from raw heterogeneous sensor data like apple watch, Raspbian, textile t-shirts, smart mirrors, mobile phones etc. And use Here SDK to identify the person travel patterns. The proposed system includes features like emotional intelligent IoT, data privacy, model adaptability.

## Autoencoder: An Unsupervised Deep Learning Approach

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**Abstract.** With the advent of science and technology, It has been observed that autoencoder plays a vital role in unsupervised learning and in deep architectures for many tasks like transfer learning and other tasks. Learn efficient data coding in an unsupervised manner, a variety of artificial neural network is used, which is known as autoencoder. Here we present an entire overview of an autoencoder and learning about what actually autoencoder is and how are they used. Here we will learn about the architecture of autoencoder, their implementation, types of autoencoder like denoising autoencoder, sparse autoencoder, the use cases, and a lot more things.

## A comparative survey of consensus algorithms based on Proof-of-Work

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**Abstract.** Blockchain is the foundation of cryptocurrencies and many other industries such as healthcare, supply logistics, and so on. It is a system of distributed ledger that is now attracting lot of research attention. Peer-to-peer and cryptography technologies are essential components of blockchain, as are consensus procedures that ensure blockchain systems' transparency, decentralization, and security. The Proof of Work (PoW) consensus protocol is now adopted by most blockchain systems, although other variations are available. We examine PoW and its six variants and analyze their pros, cons, scalability, maintenance cost, block generation time, transaction cost, energy consumption, validator selection criteria, mining profitability, and 51% attack in this study.

## Analysis of User Inclination in Movie Posters Based on Color Bias

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**Abstract.** Visual bias can be described as the phenomenon of showing a preference for a particular visual stimulant based on some inherently unique characteristics possessed by it. This predisposition is quite apparent in everyday life: different people respond differently to the same visual information. The careful utilization of this phenomenon can be extremely utilitarian. This is apparent from the recent widespread acknowledgment of visual bias and its manipulation to bring about salutary business effects. Today, visual bias utilization can be seen at play in a number of different industries ranging from advertisements to recommendation systems of OTT giants. Despite the fact that the existence of visual bias is now widely accepted, few empirical studies have been conducted to confirm the same. The present article and the ensuing research serve to bridge that gap. In our article, we elucidate the salient points of the research we conducted using movie posters as a means of estimating and studying the effects of visual bias. We built a web application to survey and collect user ratings for movie posters belonging to different genres and thus having different visual effects. Based on the user's input, a bias mapping was done, the result of which was the genre that the user was most visually partial to. Contingent on that, neural style transformation was applied to movie posters and the augmented results were presented to the user to rate. By comparing the initial genre-wise ratings to the transformed genre ratings, the extent of visual bias was detected and thus analyzed. Our study not only confirmed the empirical existence of such bias, but the detection methodology outlined here may serve as a visual bias manipulation tool that can utilize real-time machine learning to optimize AdSense and the likes.

## Data mining approaches for Healthcare decision support systems

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**Abstract.** Data mining is a user-friendly approach to locating previously unknown or hidden information in data. The employment of data mining technologies in the health care system may result in the finding of relevant data. Data mining is used in healthcare medicine to construct learning models that predict a patient's condition. Data mining technologies have the potential to benefit all stakeholders in the healthcare industry. For example, data mining may aid health providers in detecting theft and fraud, medical organizations in making customer service management decisions, physicians in discovering effective therapies and best practices, and customers in obtaining suitable and less expensive healthcare. Contemporary systems, due to their complexity and size, are unable to control and analyze the huge amounts of data generated by healthcare operations. Data mining is a technique and mechanism for converting a large amount of data into useful information. The fundamental purpose of this research is to look at what makes clinical data mining unique, to give an overview of existing clinical decision support systems, to identify and select the most common data mining algorithms used in modern Health and Demographic Surveillance System (HDSS), and to compare different data mining algorithms.

## STOCK PRICE PREDICTION USING PRINCIPAL COMPONENT ANALYSIS AND LINEAR REGRESSION

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**Abstract.** To determine the future stock value of a company is the main purpose of stock price prediction there is a continuous change in the price of stocks which is affected by different industries and market conditions. The high dimensionality of data is a challenge for machine learning models because highly correlated dimensions/attributes may exert influence on precision of the model. PCA is used to reduce dimensionality to fit linear regression algorithm for future stock price prediction. Linear regression algorithm is used prior to and subsequent to implementation of Principal Component Analysis on the Tesla stock price data. Results manifest that production of machine learning models can be boosted by PCA, reducing the correlation and appropriate selection of principal components for high redundancy of data. Root mean square value and R-square value is used for assessment.

## The Changing Role of Information Technology Management in the Era of Artificial Intelligence

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**Abstract.** Artificial intelligence (AI) has proven its popularity in the age of industry 4.0 through reforming the area of information technology (IT). It intends to transform information technology infrastructure into intelligent systems, restoring AI importance in the IT industry. AI may play a critical role in information technology because it is primarily about virtual machines, applications, and data communication protocols. Presently, AI has established itself as a brand that identifies innovative techniques and its implications in a variety of disciplines. IT is changing at a rapid rate. This rapid change has become a continuous strength, but change has always been extremely problematic. It requires rapid change in information technology management. Change is not easy to adopt as we strongly fight with any change and the similar case also correct for business organizations. For business organizations, new change can associate to more dangers and more probable for business interruptions if it is not managed efficiently with a pre-defined information technology management policy and procedures. In business organization information technology management requires proper training, procrastination, internal support, vendor support, new measures and inducement. This paper provides an overview of the changing role of information technology management in the era of Artificial Intelligence.

## Energy Minimization of cloud computing data center strategies, research questions: A survey

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**Abstract.** Large client models use cloud computing because it has several benefits, including minimizing cost of construction resources and its elasticity property which enables services to also be up or down to current demand. And order to provide cloud services, which meet all the requirements specified in service levels agreements, there are so many challenges to still be overcome from the cloud-provider viewpoint (SLAs). As data centers absorb huge quantities of power it is a major challenge in cloud computing to increase their energy efficiency. The main purpose of this systematic analysis is to present and analyze many algorithms in this cloud computer environment used to reduce the energy from datacenter and to compare solutions for research challenges. In the energy-conscious cloud applications of the data center, a new combination of the Virtual Machine Image Constructor (VMIC) is possible to evaluate component efficiency. In addition, the capacity to satisfy the required SLAs would ideally reduce energy on various host machines using VM implementations. Using less VM migration and PM shutdowns than a common heuristics method. The ongoing research work on the minimizing of energy strategies used in cloud computing is a comparative research study.

## A hybrid grey wolf optimizer for modeling and control of permanent magnet synchronous motor drives

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**Abstract.** The model order diminution and controller design of the permanent magnet synchronous motor drive, which is commonly called PMSM, are performed in the complex delta framework using a hybrid metaheuristic

algorithm. Two fundamental algorithms viz. the firefly technique and the grey wolf optimizer (GWO) are combined to develop a new topology termed as the hybrid grey wolf optimizer (HGWO). A PMSM drive made up of both the speed and current controllers was originally generated, by using an identification method used for signal processing, to yield a lower-order model. The second-order model in cascade with an appropriate controller is thus compared with a chosen reference to estimate approximately the control parameters which are not known beforehand. The continuous parameters almost imitated the parameters set with the delta operator. Thus for the drive thereby a unified control system is built. Therefore, both for order reduction and for calculating the control parameters of PMSM drives, the proposed algorithm is successfully used. Besides, a case study for the control of such special motor drives can also be investigated in the future for many household as well as commercial purposes.

## An Extensive Survey on ICT based English Language Teaching and Learning

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**Abstract:** Learning and teaching a language is perceived to be a difficult task. Advanced teaching aids should be available to make such intricacies easier, as it is the need of the hour. The rapid growth of the Internet has ushered in a technological revolution in all aspect of our lives, including teaching and learning. The use of information and communication technology (ICT) has a noteworthy impact on the quality and quantity of the teaching-learning process. ICT can improve teaching and learning by providing dynamic, interactive, and interesting content, as well as actual opportunity for personalized education.). Due to technological advancements, today's classroom atmosphere differs significantly from the previous-traditional arrangement. This paper, on the other hand, focuses on ICT tools that aid in the development of English language learning and teaching methods in order to demonstrate how technology affects second/foreign language education and how it can be effectively used in the EFL (English as a Foreign Language) classroom; these tools include both web-based and non-web-based tools, as well as how they can be used in the classroom.

## Utilizing Off-Chain Storage Protocol for Solving the Trilemma Issue of Blockchain

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**Abstract.** Today, numerous apps are being deployed on the blockchain to extend security and transparency. In order to cope with most of the real-world applications, blockchain is needed to be in its perfect state. For this purpose, the trilemma concept is addressed to emphasize the complete cooperation of decentralization, security and scalability without compromising any of these attributes. However, after years of revolution in the digital transaction sector, miners face serious scalability issues with bitcoin's peak limit of only 2-3 transactions/second. Furthermore, the ledger size of bitcoin is on the way to exceeding 350 GB and growing exponentially. Among all other cryptocurrencies, bitcoin is far ahead in terms of security and decentralization. However, it lacks proper scalability. Instead of being secure and decentralized enough, the bitcoin blockchain cannot sustain any longer without scalability. In this paper, this trilemma problem is focused on making the bitcoin scalable enough, so that a bitcoin-like secure and decentralized blockchain can be adopted in real-life applications. A theoretical strategy for increasing throughput and reducing storage dependency is introduced in this paper. A solution for bitcoin's scalability issue in terms of throughput and storage, which uses IPFS and a dual-blockchain technique, is presented.



## Study Of Document Clustering Algorithms applied on Covid Data

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**Abstract.** The advancement in the technology rises online unstructured data. As the data grows rapidly, tackling the information is becoming hard. There is a demand to maintain these unstructured data to gather important insights. Clustering of the text documents has become leading edge over internet. Document clustering is mainly described as grouping of the similar documents. It plays vital role for establishing massive information. The paper shows an overview of study done on different clustering algorithms on covid data. The study of the semantic links between words and concepts in texts aids in the classification of documents based on their meaning and conception. The clusters were visualised using the k-means clustering technique, which was then evaluated using t-distributed stochastic neighbour embedding (tSNE) and Principal Component Analysis (PCA).

## COURSE AND PROGRAMME OUTCOMES ATTAINMENT CALCULATION OF UNDER GRADUATE LEVEL ENGINEERING PROGRAMME USING DEEP LEARNING

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**Abstract.** Outcome based education (OBE) is playing important role for producing successful engineering graduates. OBE provides an engineering graduates are employable and accepting their graduation as globally competent. After end of the graduation, this outcome based education will enable graduates to compete the global market. This paper gives course outcome (COs), programme outcome (POs) and programme specific outcome (PSOs) attainment calculation of under graduate level engineering course. Here, we are taking Cloud Infrastructure and Computing core course for B. Tech – Information Technology programme. This paper explains detailed view of course plan, knowledge levels, delivery methods and assessment. The direct and indirect methods are used for assessment and attainment process. At the end, based on attainment results we find the graduates level and programme outcome attained or not. The course end reflective report provides information about course attained or not. Also this end report will be used for next academic year course input. At the end of this paper, we can easily track the performance and attainment of POs and PSOs.

## Multilayer Communication Based Controller Design for Smart Warehouse Testbed

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**Abstract.** Regarding a smart warehouse, building an industrial control system (ICS) that works effectively with the requirements is essential. An ICS, on the other hand, is a broad category of command and control networks and systems that support a wide range of industrial processes. They include SCADA systems, distributed control systems (DCS), process control systems (PCS), safety control systems (SIS), and other, generally smaller control system designs like programmable logic controllers (PLCs). In this paper, a typical 4-layers ICS, including a warehouse management system (WMS) software, was introduced to control all processes in the supply chain of a smart warehouse testbed. The WMS software initially achieved the set goals in terms of basic tasks. Furthermore, ICS worked well without incidents such as blocked or delayed flow of information, inaccurate information sent to system operators, etc.

## Career Advisor Using AI

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**Abstract.** Nowadays, students have difficulty choosing the right career choice for their future. Students need to know their abilities and interest before choosing their careers for a bright future. The system will help the students opt for the apt career choice based on their performance in the aptitude test. The system uses AI to predict the career path of students. Once the student clears the aptitude, a certificate of achievement is issued to motivate the student, along with a dashboard consisting of career trends for the next five years. The dashboard will help students in choosing a career in that field. The model learns continuously from student feedback there upon latest trend could be captured. Using such a system would prove beneficial for educational institutions in shaping the future.

## Empowering Indian Citizens through the Secure E-Governance: The Digital India Initiative Context

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**Abstract.** In India, e-governance has progressed from the computerized system of government units to programmes that encompass the finer elements of governance, including the citizen-centric approach, responsiveness, and accountability. Lessons learned from prior e-Government programmes have helped to shape the country's advanced e-Government policy. Although, policymakers have been persuaded to speed up the deployment of e-Government across the different bodies of government at the national, state, and municipal level, yet there is a need for preventative steps to minimize cyber-attacks. In other ways, cyber-security issues appear to be roadblocks to e-governance achievement. These challenges may include socioeconomic, religious,

and technological limits, as well as privacy and security implications. Despite the numerous obstacles and limits, the government is confident in its ability to overcome these obstacles and pave the road for the success of e-government. Different significant initiatives of e-governance, security issues-challenges, and prospects of e-governance in the Digital India context are discussed in this study.

## A novel blood vessel parameter extraction for Diabetic Retinopathy Detection

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**Abstract.** Diabetic retinopathy (DR) is one of the leading causes of visual loss if it is not treated at an earlier stage. Manual identification of diabetic retinopathy is a time-consuming process and regular screening is a must for an early diagnosis. This paper presented a novel blood vessel parameter extraction method for DR identification using image processing and data mining techniques. An automatic DR diagnosis through image processing techniques, by extraction of blood vessel parameters such as vessel density, minimum and maximum thickness of blood vessels and classification through data mining techniques was proposed. Mostly diabetic retinopathy identification was done by lesion pattern identification such as exudates, microaneurysms, cotton wool spots, etc. However, this work concentrated on calculating the disease parameter through segmented blood vessel region from full fundus image, optic nerve head region and Inferior, Superior, Nasal and Temporal (ISNT) region. Evaluation of this work was performed on DRIVE and HRF datasets and achieved overall accuracy of 97.14% in terms of DR prediction.

## Identifying Criminal Communities in Online Networks via Non Negative Matrix Factorization-Incorporated Sentiment Analysis

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**Abstract.** Right from the internet has been publicly available users have been able to engage with one another through virtual networks and in the last decade, due to the emergence of online social networks, community identification in complex networks has received a lot of attention. As community identification task involves identifying important people and their linkages, social network analysis is one such technique to analyse complex networks such as criminal networks. Keeping in view the diversity of actors and gangs involved in crime activities, the goal is to investigate and assess their characteristics so that the essential information characterising their behavior is extracted. The current work will employ a social network analysis based novel approach called SAOIN (sentiment analysis on influential nodes) to attain this important goal. Our approach claims to be computationally efficient as only the influential nodes (aka leaders) of the established subnetworks (communities) are taken into consideration for further investigation rather than inquiring each and every actor of a network. This discerns our model from other already existing community identifying techniques. The proposed model generates small subnetworks that can be used to discover the list of actors and their relationships that need to be inquired further, As opposed to other already existing community detecting methods that generates larger and much complex networks. This study inquires actors of the social network like twitter whose activities promotes criminal propaganda across diverse stages. The information dissemination among these actors directs sole insight towards their behaviours.

## A Performance Evaluation of Genetic Algorithm and Simulated Annealing for the solution of TSP with profit using Python

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**Abstract.** The Travelling Salesman Problem with profit (TSPP) is defined on an graph  $G = (V, E)$ . Traveling salesman problems with profit (TSPP) is a generalization of the traveling salesman problem (TSP), with one condition that it is not required for a sales person to travel all cities of the network. Our main purpose is to optimize the total profit and cost of the travelling. Here we are focusing on that in the case of TSPs; in real world scenario it is not always relevant for the salesman to visit each and every customer or city. To solve the problem, a GA with special mutation operators has been presented. Here we have utilized and compared different heuristic techniques GA (Genetic algorithm) and SA (Simulated Annealing). Numbers of tours plots are generated for the comparison of performance of both the algorithm implemented for the solution of TSPP. These plots are beneficial for route planner and for those who want to apply this concept of TSPP. It has been observed that SA performs better than GA, as the response consumed less time than GA.

## Fuzzy Logic Based Disease Classification Using Similarity Based Approach with Application to Alzheimer's

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**Abstract.** With the advent of the post genomics era, there has been a surge in the amount of medical data for healthcare applications as well as the number of novel solution methodologies. The management and analysis of this data is a tricky task, as the data is scattered over a plethora of public and private repositories. The task becomes challenging if the data exhibits diverse characteristics such as gene information. Finding the gene of interest, causing a certain disease, or understanding the case-control dataset is a much daunting task for the researchers. Locating the targeted gene, responsible for causing a certain disease, will depend upon the ability of computational methods. The current software based on these methods use various statistical tests for performing the intended function. The statistical test used performs univariate classification independently for each gene of interest. To circumvent the uncertainty of the role of each gene independently, fuzzy logic plays a crucial role. It uses similarity-based approach to analyze the data especially real time data. Therefore, the aim of this work is to demonstrate the use of fuzzy logic for gene identification and disease classification in an efficient manner.

## IMPLEMENTATION OF E2EE USING PYTHON

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**Abstract.** The need for cyber security is felt now more than ever. In an era of constant mass surveillance, illegal spying and cyber-attacks, it is extremely important to have a secure means of communication which cannot be intercepted. Several new protocols were introduced such as HTTPS to encrypt the connection between the client and the server. This made sure that no third person can read the data being transmitted to and from the client. This model of encryption had one major flaw: the server itself. Every message that was encrypted by the sender

was decrypted at the server, encrypted again and sent to the receiver. Thus the server can read all the messages. The users of such chatting services had to trust the owners of the services with their privacy. Even if the owners were not involved in shady data deals, they still had the risk of their servers getting hacked or being pressured by the government to reveal the data of their users. All these issues paved the way for a new type of implementation of encryption known as end-to-end encryption often abbreviated as E2EE. The message to be sent is encrypted by the sender and is sent to the server which relays it to the receiver as it is. Since the keys used to encrypt and decrypt the data are available only to the users, the server cannot read the messages sent through it. This model quickly gained popularity and was implemented by many messaging applications, the most notable being Whatsapp, Signal, Telegram, Wire. In this project we are going to implement E2EE using python. For encryption we intend to use the AES algorithm. AES stands for Advanced Encryption Standard which was introduced in 2001 by the NITS (U.S.A.). It was developed by Vincent Rijmen and Joan Daemen in response to the earlier broken algorithm DES. AES is a symmetric key encryption algorithm meaning that the same key is used for encryption as well as decryption of the messages. This algorithm has 3 key lengths - 128, 192 and 256 bits whereas a single block size of 128 bits. The version we are going to implement is 128 bits key size.

## Performance Assessment of DVR in a Solar-Wind Hybrid Renewable Energy Connected to Grid Using ANN

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**Abstract.** The accessibility of Renewable Energy (RE) resources are getting cheaper day by day, using technological advancement and the connectivity with the conventional grid is very common now a days. The hybrid power generation has been rising exponentially in order to meet the power demand. In such constraint the distribution lines are becoming more complex to analyse the real time operation when there is any disturbances occur. It not only initiate several power quality problem at industrial & utility consumer end but also disturbs the performance of the line. Therefore study of performance assessment is important in a grid connected solar-wind hybrid renewable energy in the presence of Dynamic Voltage Restorer (DVR). In this paper, DVR is connected to the grid under abnormal condition as the generation of solar-wind hybrid power varies from time to time. To assess the system reliability and effectiveness of the scheme, different types of shunt fault cases are conducted with and without DVR. The result of this paper shows that during small transient disturbances or the fault cases, DVR helps to mitigate the sudden decrease of voltage magnitude by injecting the reactive power. The wind turbine (WT) and Solar Photovoltaic (PV) duo system when connected to the Conventional Grid (CG) should follow standard Grid Codes (GC). Further to validate the fault case an attempt is considered using artificial neural network (ANN).

## WhyMyFace: A Novel Approach to Recognize Facial Expressions using CNN and Data Augmentations

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**Abstract.** Aptitude, in terms of human facial recognition, cases prior one of digital image's fundamental parts. This conveys facial parameters in many social contexts. Medical imaging, robotics, intrusion detection system with sentiment analysis, Automation and some industries use computer vision to understand human facial expressions. Studying human facial expressions using deep learning has become popular in recent years, and several efforts have been made. However, facial expression recognition remains challenging because of the wide range of persons with similar facial expressions. This paper proposed a 16-layer efficient CNN technique to categorise human facial expressions with data augmentation. Then, we evaluated our proposed approach on a well known facial expression recognition, the FER2013 benchmark dataset. And, the proposed technique achieves state-of-the-art testing accuracy of 89.89% exceeding some prior research.

## DEVELOPMENT OF IOT MIDDLEWARE BROKER COMMUNICATION ARCHITECTURE FOR INDUSTRIAL AUTOMATION WITH FOCUS ON FUTURE PANDEMIC POSSIBILITIES: INDUSTRY 5.0

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**Abstract.** Internet of things is becoming more prominent development domain globally. Developments in the industrial IoT are necessary for consideration of future pandemic situations like Covid-19 pandemic. Covid-19 pandemic almost affected all domains throughout the world. Now it is necessary to think in a progressive manner and be ready to tackle such situations. One of the most affected sectors is the manufacturing sector, which failed to match the demand and supply chain due to frequent lockdowns. A development of recent Industry 5.0 is a result of a need for the industrial automation. Even though the challenge remains to lower the human-machine interfacing with the development of maximum IoT automation and we may call this as a building block of Industry 6.0 based on feedback from Industry 4.0. What if manufacturing industry is molded like call center support where workers can manage the production line by operating processes from anywhere? As an initial step, this paper presents the new middleware broker communication architecture design for MQTT and CoAP protocols, which can be a building block for Industry 6.0. This paper focuses on two key roles as the design of middleware broker communication architecture for MQTT and CoAP for industrial automation with consideration of common packet format parameters and development of deep learning algorithm "Multi-ProTest" for IIoT security analysis. This improves the overall system performance by reducing delay by 6.17% and jitter by 14.10%.

## Development of DeepCovNet Using Deep Convolution Neural Network for Analysis of Neuro-Infections Causing Blood Clots In Brain Tumor Patients: A Covid-19 Post-Vaccination Scenario

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**Abstract.** Covid-19 outbreak is ones in hundred years' experience for each human being around the globe. Frequent lockdowns and unpredictable days shaken whole world. While researchers are struggling for genome sequencing and understanding the changes occurring in virus sequences, on the other hand, common people are struggling to control their fear about the future in all aspects. After the successful research for vaccination, the medical experts analyzed the post-covid-19 impacts on various health fronts like heart failures, thrombosis, impact on brain and many more complications. Out of which identification of post-covid-19 impact on brain

took more time to understand the exact way the virus is affecting because psychological behavior is the first symptom and that takes keen observation to suggest the possibility of neurological infections. But, by that time, the illness reaches to more serious complications. Also, post-vaccination evidence shows that the blood clot formations becoming a new challenge for brain tumor patients. The blood clots in nervous systems are so tiny that by MRI/CT, it is not possible to differentiate between cerebral fluids. Hence, it becomes necessary to operate patient immediately with a clear vision facility for blood clots. Hence, this paper suggests the new deep learning algorithm which can be a great solution for image analysis with high level of accuracy. The proposed deep CNN module further can be used as a software package for needle camera for robotic assisted surgery, which intern saves time for image analysis and direct location of tumor can be identified during live camera surgery.

## An empirical evaluation to measure the blended effect of Test-Driven Development with Looped Articulation Method

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**Abstract.** Attendance monitoring system is an inevitable part to judge the student performance in any academic setting especially for Higher Academic Institutions (HAIs). Attendance is an important governing factor to let institutions decide whether students would appear for various end term examinations, collaborative projects, national international hackathons and a lot number of in/out-house activities. It also controls students' performance in various National and International endeavors related to placements, internships etc. outside the institution. So there has always been a dire need to develop a high performing efficient attendance monitoring system. Various softwares are already available which follow the traditional software development methodology i.e. the waterfall approach. Since the inception of a new approach of software development called Extreme Programming methodology, one of the best practices called Test Driven Development (TDD) is replacing customary development extensively. TDD methodology addresses various issues related to the efficiency and usefulness of softwares developed through customary waterfall approach. The work in this research work proposes a tool AMS<sub>td</sub> which blends TDD with the looping articulation method. Looping articulation method further improves the efficiency of TDD approach. The concept of looping articulation with TDD is new to the development of attendance monitoring system software. The proposed tool is compared with various similar existing tools and the results are quite promising in terms of quality attributes governing softwares. Two groups of students are taken with the same grade (same caliber). One group uses the traditional approach and another group adopts the proposed tool AMS<sub>td</sub>. The discipline size is kept same in both the groups to maintain the consistency of results. The results obtained through the proposed tool are much more promising as compared to similar work done in literature till now.

## Machine Learning Models to Predict Girl Child Dropout from Schools in India

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**Abstract.** Good education is the foundation of developing nation. Government and number of NGOs are continuously working to spread awareness about importance of education. Smile foundation's "Each One Teach One" teaching philosophy is one such initiative. The paper proposes a model to predict dropout rate among school girls, which will further help School authorities, Govt. agencies & NGOs to reduce school dropout at an early stage. For prediction, two machine learning techniques Naïve Bayes classifier and Logistic Regression model have been compared.

## Keeping the Integrity of Online Examination: Deep Learning to Rescue

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**Abstract.** Online education is growing remarkably because of its capability to transfer knowledge and skills remotely. It is playing a key role in this pandemic. However, it poses new challenges that need to be addressed. The examination is an integral part of any education system to judge the learner's depth of knowledge. In the online examination, keeping the integrity of the examination is very difficult since students and examination proctors remain in remote places. Manually proctoring several students continuously and consistently using webcams is a tedious process. Several unethical activities may remain unnoticed. It will be beneficial if machine intelligence can help human proctors. Existing researches are either based on student identification using face recognition without considering different inconsistent activities or fully automated bypassing the intelligence of human proctors. Thus, we propose a semiautomated proctoring system using machine intelligence that helps a human proctor by reporting inconsistent activities and annotated videos. Inconsistent activities during examination are done to deceive in the examination, such as copying from other resources, communicating with other people, or not being present in front of the camera. Such activities can be identified by excessive eye or lip movements or the absence of the student. The proposed system uses videos captured by a webcam and continuously verifies and logs these three activities. We experimented with two different models using Convolutional Long Short Term Memory (convLSTM) and Residual Network (ResNet50). We obtained validation accuracy of 92% and 97% respectively using convLSTM and ResNet50.

## Study of Spike Glycoprotein motifs in Coronavirus infecting animals and variants of SARS-CoV-2 observed in humans across Countries

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**Abstract.** The greatest threat the world currently faces is due to the Covid-19 pandemic and its adverse effects. This in turn has obtained greater support in research and study on this field with the aim of a better tomorrow. Due to the large scale spread of Covid-19 which in turn caused high possibility of mutations in this virus prompted us to conduct a study on the spike glycoprotein sequence of this highly debated organism. This study is conducted on two aspects: first on the spike glycoprotein sequences of coronaviruses infecting animals based on association with humans and the second on variants of SARS-CoV-2 based on geographic location of the sequences collected. Corona virus is considered to be originated in bats and reached humans through unknown sources. We extend this possibility by conducting studies on the spike glycoprotein of coronaviruses that infect animals having some association with humans directly or indirectly as well as to provide better insights into the different mutations that had occurred to the SARS-CoV-2 as it spread through countries. The most similar organisms sharing a significant motif 'KRSFIEDLLFNKV' of spike glycoprotein in our study are coronaviruses found in bats and cat. From the current study of mutations in the surface glycoprotein domain of SARS-CoV-2 observed in samples collected from 15 different countries, the amino acid present at 613th position was found to have the most stable mutation. The computational study detailed here provide better insights to the possible origins and transmission of SARS-CoV-2 viruses

## Graceful Labeling of Hexagonal and Octagonal Snakes along a Path

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**Abstract.** This paper focuses on rows of Hexagons linked to one another forming Hexagonal Snakes (HS<sub>n</sub>). These Hexagonal Snakes are aligned as vertical columns by connecting them to every vertex of a Path. The vertices and edges of this graph are provided with numerical values using Graceful Labeling and satisfies the condition of Alpha Valuation.

## Impact of Security Challenges over Cloud Adoption – A Comparative Study

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**Abstract.** Offerings of increased efficiency, better scalability and faster deployment make the cloud environment highly demanding in the business. Nowadays, successful cyberattacks are continuously rising, organizations are paying more ransom to the cybercriminals to recover their own data. Moreover, the confusion over the fundamental responsibilities of shared cloud security among the stakeholders are still unresolved. Consequently, security became the biggest challenge for the cloud. Moreover, public cloud has increasingly gained the trust over the on-premises security provisions. This paper is an attempt to find the correlation existence between the ‘cloud security’ and ‘cloud adoption’, for that a hypothetical test has been conducted to defend the significance of correlation to draw a statistical inference from it. The outcome of this research hypothesis indicates that the cloud security is not the biggest concern as compared to the benefits it offers. Overall, the significance of correlation, significance of observed correlation, confidence interval and probability (P), all together justify the assumed hypothesis: “Cloud security challenges have no impact on cloud computing adoption”. Finally, Despite the highly beneficial offering of cloud services, its threats and challenges are more prevalent than ever, regardless of its threats and challenges the rate of cloud adoption is continuously rising.

## A Passive Infrared-Based Technique for Long-Term Preservation of Forensic Evidence

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**Abstract.** Accurate and precise measurement of evidence is fundamental to forensic investigations. Incorrect mapping of evidence to the surroundings can lead to the eventual exclusion of evidence or spark a debate over its significance. The paper proposes a technique to record the traces of thermal radiation at the crime scene to recreate and preserve the evidence for future forensic analysis. The research introduces a novel application of passive infrared radiation to preserve biological evidence for a longer duration.

## Steering Wheel Angle Prediction from Dashboard Data Using CNN Architecture

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**Abstract.** Various innovations on self-driving cars are trending in the automobile industry these days. The general approach for AI applications is to collect the data through various sensors that are fit in a car, process them through appropriate techniques, and then train a model upon which one can try and test the efficiency of the model. Many companies like Tesla, Uber, Waymo (a subsidiary of Google), Mercedes, etc. are already working with a lot of sensor-captured data and high computation power. The sensors range from normal Cameras to high end Ultrasonic and LIDAR sensors. Whatever be the data that we capture, the basic intention is to move swiftly through a path given various twists and turns, and other traffic conditions, where the car needs to be correctly steered as per the external environment. We should know that more the data we capture, more shall be the complexity of the system, hence more will be the required computational power for that. In this paper we present a simple model where we capture data through a front dashboard camera, process it through a CNN and predict the appropriate steering angles based on the external traffic conditions, where we have acquired a significant level of accuracy. We assume automatic transmission system in our vehicle without clutch and gears.

## Comparison and Analysis of Various Autoencoders

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**Abstract.** The autoencoder is family of deep neural network which learns to reconstruct its input. It has three main parts encoder, code and decoder. Autoencoders are effective unsupervised learning method which encode an input into a lower dimensional representation. This representation input consist of input as features are useful for image processing applications. The size of hidden representation is lesser then the original image that's undercomplete autoencoder. If the size is greater than the hidden representation that is overcomplete autoencoder. This paper compares and evaluates many architectures of autoencoders model.

## A new delta ( $\delta$ )-doped partly insulated SOI MOSFET for analogue/RF applications

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**Abstract.** The scalability, thermal efficiency and analogue/RF performance of single-gate delta-doped completely depleted silicon on insulator MOSFETs are investigated in this paper. To lower the self-heating effects and enhance the high-frequency operation of D-Pi-SOI MOSFET, a new p-type delta-doped fully depleted SOI MOSFET (D-Pi-SOI MOSFET) is presented. The developed analogue/RF figure of merit viz. the transconductance generation factor, transconductance, maximum oscillation frequency, unity-gain frequency, and D-Pi-SOI MOSFET demonstrate the device's potential for analogue/RF applications. This device is also extremely scalable because of decreased subthreshold swing, drain-induced barrier lowering, and parasitic capacitances. The findings of this implementation demonstrate that the D-Pi-SOI MOSFET has a high gain-bandwidth product. The comprehensive manufacturing flow of a DSSB Pi-OX- $\delta$ - MOSFET is proposed, demonstrating DSSB SOI MOSFET's performance is notably enhanced with bare minimum steps.



# Smart Contract Assisted Public Key Infrastructure for Internet of Things

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**Abstract.** IoT devices use PKI to authenticate themselves in the network to manage the authenticity of network, data confidentially and data integrity. This paper proposes an approach to implement the smart contract-based Public Key Infrastructure (SC-PKI) for the Internet of Things. In the proposed approach, Smart contracts are used for public-key life cycle management starting from the generation of the public key, distributing public key to the revocation of the public key in the form of X.509 certificate. SC-PKI does not have any third-party centralized certification authorities (CAs) to issue, validate, and revoke the certificates. All these activities are executed by the smart contract on a dedicated blockchain network. The proposed approach enhances the network's security, avoids single-point failure, and increases the certificate verification performance.

## IoTFEC-19: Internet of Things based Framework for Early Detection of COVID-19 Suspected Cases

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**Abstract.** World is battling with COVID-19 Pandemic, it has infected 236 million and taken over 4.83 million lives globally. In India alone, 33.89 million are infected and caused over 4.49 Lakh of fatalities. In Jammu and Kashmir, 3.3 Lakh are infected and caused over 4.4 thousand deaths. Researchers are trying their best to come up with solutions that can combat COVID-19. It is slated that the world has to battle with it and to follow SOP's until and unless an effective vaccine will be developed. On the technological side, IoT is a new and promising area to combat with the COVID-19 Pandemic. Nowadays, smartphones and wearables have various onboard sensors like temperature sensor, proximity sensor, an audio sensor, camera, inertial sensor, color sensor, etc. that can be used in getting the data of a person. The temperature sensor reading can tell us the temperature of a person. Based on that reading, a person can be sent for further clinical tests at an initial level. IoT technology can accurately manage patient information, and can be effective in proactive diagnosis with reduced cost. The IoT technology, a set of well-organised components, can work together as a part of an system to fight against and will lower the spread of the COVID-19 Virus. IoT has gained considerable attention from almost every field, such as industries and especially from healthcare. IoT technology is reshaping the traditional healthcare system by incorporating technology into it. In this article, a IoT layered architecture have been proposed with three different layers. The detailed working of all three layers is explained. A novel IoTFEC-19 framework has been proposed to detect COVID-19 suspects early with sensors and wearable devices. The Framework consists of three layers: Sensing Layer or Data Collection Layer, Data Analytics Layer and Prediction Layer. In Sensing Layer, different sensors are used to collect the data and send it for analysis. In Analysis Layer, the level of symptoms is calculated from the data received from the Sensing Layer. The third layer is the Prediction Layer, in which prediction is made from the computed values in Analysis Layer, whether the suspected may be COVID-19 positive or negative. The last layer is the cloud layer used for storage services and data used for further analysis. The proposed IoTFEC framework aims to detect the COVID-19 suspected early, provide early treatment, and stop further spreading.

## Location Accuracy and Prediction in VANETs Using Kalman Filter

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**Abstract.** Many vehicular network applications such network administration, routing, data transmission protocols require location information. If a precise prediction of the vehicle's future move can be made, resources can be allocated optimally whilst vehicle travels. Will result in improving VANETs performance. For that purpose, Kalman Filter is proposed for correcting and predicting vehicle's position. The research used both real vehicle movement traces and model-driven traces. Kalman Filter and neural network-based techniques are quantitatively compared. Across all scenarios proposed model exhibits superiority than other correction and prediction schemes.

## Implementation of a Multi-Disciplinary Smart Warehouse Project with Applications

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**Abstract.** In this study, a multi-disciplinary cooperative project was implemented with the desire to close the gap between university education and industry, equip students with “work-ready” competencies, and the ability to work in the global and emerging technologies environment. Consequently, a project entitled smart warehouse with the participation of students from three related schools was proposed and implemented. Through the project, the students developed a variety of competencies, including literature review, brainstorming, concept sketching and design, teamwork, peer/cross-evaluation, hand-on skills, interdisciplinary knowledge, problem-solving, project planning, modular design concept, design of experiment, etc. Specifically, through the survey, the average improvement in the Level of Confidence is 1.35 out of 4, and that of the Level of Knowledge or Skill is 1.29. Generally, the overall average improvement levitates from 2.20 to 3.51.

## Machine Learning Approach Based on Fuzzy Logic for Industrial Temperature Regulation

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**Abstract.** In recent times fuzzy logic has entered as a superior control methodology for processes that are mathematically difficult to model. Fuzzy based system focuses on systems that use knowledge based techniques to support human decision making, learning and action. In this paper a fuzzy knowledge based controller (FKBC) has been proposed based on fuzzy logic knowledge using linguistic variables representation and inference formalism. The proposed FKBC is a unique closed loop fuzzy logic controller (FLC) structure having a small rule base with an efficient realization and can be easily implemented in existing industrial temperature controllers. This includes dealing with unknown and probably variable time delays, operating at very different temperature set points without returning.

## Energy Monitoring with Trend Analysis and Power Signature Interpretation

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**Abstract.** Energy consumption and the science behind the patterns in electricity expenditure have been rapidly growing fields in technology for decades owing to the vital nature of fuel. This research explores room for advancement in exploiting consumption data and generating smart results powered by state-of-the-art algorithms and sensors. The line of experimentation for this problem statement is focused on enabling users to interpret their power consumption efficiently and interact with live visual trends and limit their consumption to a customized estimate. Prediction models for forecasting consumption, analyzing power signature of high load appliances, and monitoring of appliance power state have been built based on parameters such as instantaneous and cumulative energy, power, and solar energy. Although the scope of this setup is limited to individual accommodations, the purpose of this research is to extrapolate the functionalities to an industrial scale, where the importance of restricted consumption, and protection against casualties is truly evident. The proposed model improves the accuracy of time series forecasting of energy consumption as compared to existing forecasting models.

## Remote Authentication of Fingerprints using Meaningful Visual Cryptography

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**Abstract.** Now a day's fingerprint recognition plays a vital role in digital security. We can authenticate any person using a central remote server. Fingerprints have the unique characteristics to identify any person uniquely. In this paper, we propose a technique by which we can remotely transmit any fingerprint securely. Meaningful Visual Cryptography (VC) Scheme is used to implement this method. In VCS secret image (here fingerprint) is divided into multiple shares and each of these shares are integrated with some natural images and then transmitted using different network paths. Our model follows the 2 out of 2 secret sharing schemes. The major drawback of any VCS is loss of contrast in the output reconstructed image. Meaningful shares make this more difficult to retrieve the secret image. Our model uses some filtering techniques to overcome the problem and obtain the original fingerprint.

## Analysis of NavIC Signal Data for Topological Precision

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**Abstract.** Ionospheric Scintillations prevent the GPS receiver from locking on to the signal and make it difficult to compute a position. Small-scale composition in the ionospheric layer along the transmission source causes random fluctuations, which are created by the interaction of reflected light and reflected waves. Ionospheric scintillations and/or satellite unlock cause cycle-slip or total loss of GNSS signal. Low C/No (carrier-to-noise ratio), ionospheric scintillation, receiver position (low latitude), low elevation angle, and cycle-slip error are the main issues affecting PPP (Precise-Point Positioning) accuracy. Since a lot of studies have been done using GPS signals, but our NavIC technology has yet to be explored for this research, it is a major challenge and still ongoing research in PPP. Continuous tracking of GNSS carrier phase signals provides high-precision PPP solutions. PPP requires ionospheric research, which geostationary satellites can help with. The NavIC system, which includes three geostationary satellites in orbit, can fulfill this need. Pre-processing of data before positioning and identification & correction of cycle-slip error are the two methods investigated in this study that provides more efficient PPP.

## Predictive Analytics of Logistic Income Classification using Machine Learning

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**Abstract.** Accurate income data is one of the hardest piece of data to obtain across the world. Subsidy Inc. company delivers subsidies to individuals based on their income. We wish to develop an income classifier system for individuals. The income prediction model is designed using Logistic Regression classifier. The Logistic Regression model is a machine learning classification approach for predicting the likelihood of a categorical dependent variable.. In this work, we also made an experiment to compare Machine learning algorithms Logistic Regression with K-Nearest Neighbor on a data set with dimension 473421 rows and with 15 different number of columns or attributes. This experiment results shows that Logistic Regression classifier performs better with 90 percent accuracy where as KNN gives an accuracy of 87 percent.

## Early detection of breast cancer using CNN

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**Abstract.** High death rate in women is caused mainly due to breast cancer. Image processing, as well as data mining and machine learning approaches, have all aided in the development of autonomous cancer detection systems. One employed machine learning classification algorithms to distinguish between benign and malignant tumors. Digital mammography is found to be the successful tool for detecting cancer in women who have no symptoms and diagnosing cancer in women who have symptoms such as discomfort in a lump or nipple discharge. As a result, one can use Convolutional Neural Networks (CNN) in the suggested system, and Open CV was performed on a dataset from the UCI repository. [1]. The accuracy, precision, sensitivity, specificity, and False Positive Rate of each algorithm is analyzed and evaluated.

## Improvement of Speaker Verification Using Deep Learning Techniques

Kshirod Sarmah

**Abstract.** Deep Learning (DL) has been used to solve a range of real-time artificial intelligence (AI) challenges with great success. This is a cutting-edge area of machine learning (ML) that has been rapidly evolving. As a result, deep learning is quickly becoming one of the most popular and well-defined machine learning techniques, with applications in a wide range of fields, including image processing, computer vision, speech and speaker recognition, emotion recognition, natural language processing, hand-written character recognition, cyber security, and many others. Over other prevalent methods, DL approaches have demonstrated superior performance in speech processing areas like as voice recognition and speaker recognition. We describe an experimental setup for speaker verification (SV) utilizing DL techniques, and discuss its performance and findings, as well as how it outperformed established approaches such as HMM, GMM-UBM, and SVM. In this research works we analyse and review Deep Neural Network (DNN) approaches employed in SV systems. With a 1.51 % equal error rate (EER), the final result is the best performance of the SV systems of Restricted Boltzmann Machine (RBM)-based DNN.

## Hybrid Texture Based Feature Extraction model for Brain Tumour Classification using Machine Learning

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**Abstract.** The effort of detecting brain tumours by radiologists or clinical experts is arduous and time-consuming, and their accuracy is dependent on their level of knowledge. Medical scans, such as magnetic resonance imaging (MRI), provide a wealth of data that can be exploited to overcome these constraints by creating advanced methodologies and approaches for tumour detection. These approaches can assist radiologists in offering a second opinion when predicting tumours, hence reducing the human aspect in the process. In this context, the paper proposes a hybrid texture-based feature extraction (HTFE) technique by employing Gray level co-occurrence matrix (GLCM) and Gabor Filters for identifying brain tumours. Specially, the proposed HTFE technique assists the classifiers Gradient Boosting (GB), Random Forest (RF), and Decision Tree (DT) in predicting Glioma, Meningioma, and Pituitary brain tumours from T1-weighted contrast-enhanced MRI (T1-CEMRI) dataset. To train and evaluate the classifiers, the HTFE technique extracts a total of seventy-two second-order texture features from T1-CEMRI. In terms of accuracy, the suggested HTFE approach beats state-of-the-art techniques.

## A systematic review on approaches to detect Fake News

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**Abstract.** The widespread use of social media and digital content, it is extremely important for people and society to be able to assess the trustworthy sources transmitting information through social media platforms. Fake news is not a new notion, but widespread and frequent circulation of fake news is an issue nowadays. Fake news might lead to annoyance, influencing and deceiving society or even nations. There are a number of ways of identifying fake news. By performing a systemic literary evaluation, we identify the major existing techniques to identify fake news and how such approaches may be implemented in various scenarios. A comprehensive description of factors that promote and circulate fake news, challenges to identify such sources, and techniques used to determine the fake news is prepared and discussed to minimize the impact of fake news.



## An Analysis of Semantic Similarity Measures for Information Retrieval

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**Abstract.** One of the most significant difficulties in information retrieval is measuring semantic similarity. Semantically similar words, phrases, and concepts are measured in this field of study. It is the degree to which two concepts resemble one another depending on their meaning. Various measures of Semantic similarity have been suggested several times throughout the years. This paper divides these methodologies into two groups: knowledge-based and corpus-based, to demonstrate how they evolved. On specified parameters, a study of similarity approaches is performed. This assessment, which analyses each method for semantic similarity, provides an analysis, review of existing methods on semantic similarity to explore and create new ideas for researchers.

## IoT Based ECG and PCG Monitoring Systems

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**Abstract.** The utmost momentous problem for human race is the health care due to hasty surge in population and therapeutic expenditure. World Health Organization reports that population aging is the major cause of the issue. It is essential to monitor regularly the well-being of aged people. This imposes a heavy burden with the prevailing medical scheme. Hence there is a need for initial diagnosis of the disease at low cost. An effective healthcare monitoring system can be designed using Image Processing. Internet of Things assisted electrocardiogram and phonocardiogram monitoring system was proposed for secured data transmission. This system aids in continuous monitoring of the heart.

## Analysis of Misogynistic and Aggressive Text in Social Media with Multilayer Perceptron

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**Abstract.** Cyber-aggression and misogynistic aggression is a form of abusive text that has been rise on various social media platforms. Any type of cyber-aggression is harmful to society and social media users, it also provokes hate crimes. Misogynistic aggression shows hatred towards women. Automatic detection models for hateful tweets can combat this problem. Contextual analysis of tweets can improve existing detection models. We propose a novel syntactic and semantic feature-based classification model where Paragraph embedding enriches the contextual analysis of aggressive tweets and TF-IDF identifies the importance of each term in tweet and corpus. This study considers Trac-2 shared task English language dataset for multitasking classification. This novel research shows achievable performance against a baseline model and various classifiers. Among the various machine learning and deep learning classifiers, Multilayer Perceptron (MLP) portrays the preeminent performance.

## Intensity and Visibility of PSO based Waveguide Arrays with an Overview of Existing Schemes and Technologies for Multi-Beam Combination

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**Abstract.** Spectro-interferometry is a sophisticated astronomy technology that produces high-resolution pictures of celestial objects and allows researchers to investigate their morphological characteristics. In this paper, a waveguide array of 2x2 waveguides has been investigated with more than one waveguide excited simultaneously. Each and every waveguide available operates as a beam combiner, whose results determine the waveguide intensity, which means, the output intensity is determined by the waveguides used for stimulation. Hence, it is very important to select the appropriate waveguide in order to increase the intensity and visibility of outputs. The primary goal of this study is to determine which metaheuristic technique can fix the issues of waveguide selection. To achieve this, a basic variant of the Particle Swarm Optimization algorithm has been implemented and its software simulation has been done. An analysis is also carried out by calculating the performance matrix concerning magnification, intensity, visibility, and 1/Signal to Noise Ratio. Simulation results are compared with the existing models, which demonstrate an improvement of the proposed system by achieving high intensity and visibility.

## Traffic Sign Recognition Using CNN

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**Abstract.** With the revolutionary advancements in technologies such as Machine Learning, Artificial Intelligence, etc., many big companies such as Google, Tesla, Uber are working on creating autonomous vehicles or self-driving cars. Traffic Sign Recognition (TSR) plays a really important role in this as it is essential for vehicles to understand and follow all traffic rules to assure the safety of both the passengers as well as other drivers and pedestrians on the road. In this paper we study how traffic signs recognition can be done using Machine Learning. The dataset that we have used is taken from Kaggle and will contain around 50000 images divided into various different classes. This dataset will be used for testing as well as training our model. We will be trying out two major approaches used in traffic sign recognition. Our approach is based on convolution neural network (CNN) in which we vary some parameters and prepare a comparative study of how these factors affect the accuracy of our model. After comparing the accuracy of our models, we have implemented the best performing model in a web application using Flask. Also, we have included the text-to-speech feature which speaks the result to the user and makes our project more accessible.

## Learning Impact of Non-Personalized Approaches for Point of Interest Recommendation

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**Abstract.** Location-based social networks (LBSNs) have impacted our lives recently to a great deal. Typical location-based social networking sites have provision of declaring a check-in at a venue for users. Users can communicate this information with their friends, thus, generating huge dataset. This large geographical information has paved the way to build Location Based Recommender Systems. Location Recommendation service is an integral feature of location-based social networks. More and more users are using this service to explore new places and take timely and effective decisions. These Systems provide a rich knowledge about a new place that a user has never visited before and also recommend interesting locations to the user after mining socio-spatial check-in data. In this paper, the authors present non-personalized techniques to utilize the check-in information for recommending popular and interesting locations to users. Background of location-based social networks and various techniques to develop location recommender system is discussed initially, followed by existing work and research issues of location-based recommender system. Authors have presented illustrative examples to mine the available spatial information of real-world location-based social network to suggest best interesting locations.

## A Novel Approach to Ensure the Security of Question Papers using Visual Cryptography

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**Abstract.** In the recent COVID-19 pandemic situation, physical distributions of University question papers to the affiliated Colleges are very difficult. Though online distributions of question papers are a good alternative, they may be vulnerable in respect of security concerns. Hackers may intervene in the process and question papers may be stolen or altered. In this paper, we used K-out-of-N visual cryptography techniques to secure the question papers in between the transmissions. Before creating the shares, we applied an extra password protection to the original question paper using AES encryption. At the College examination center end multiple shares are received by the separate stakeholders, who were ultimately combined together to create the decrypted question paper only after having the password provided by the head of the Institution.

## Ensemble method of feature selection using filter & wrapper techniques with evolutionary learning

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**Abstract.** The improvement in data collection and mining methods have expanded the range of dimensionality or features in the data, which brings about an obstacle to many existing feature selection methodologies. This paper brings forth a fresh feature selection methodology rooted in particle swarm optimization (PSO) as wrapper method and an ensemble method to merge the results of the different filter techniques (chi-square, F-Regression, and mutual information) to find an optimal feature set that covers most of the key variables of the dataset. The local search is executed on the global best and makes use of a filter-based method, which then intends to take the advantage of the filter and wrapper methods. Our results exhibit that the proposed methodology can be successfully used to select fewer features and, at the same time, increase the classification efficiency over using all features. The proposed methodology also shows how well an evolutionary learning algorithm like the particle swarm optimizer can be used for search optimization of optimum features in the dataset.

## Recommendation Engine: Challenges and Scope

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**Abstract.** On the internet, with the increased number of users, its use for recommending products and services is also increasing. But there is a need to filter that data and provide only relevant recommendations. Recommendation systems help in solving this problem by providing personalized recommendations from a large pool of data. This paper provides an overview of the recommendation system along with its various filtering techniques. The paper also discusses various challenges faced by the current recommendation systems and the possible research areas in this field that can improve its efficiency.

## A study on using AI in promoting English Language Learning

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**Abstract.** The transformation in the way we live, work, and learn is characterised by the fast proliferation of technology and digital applications. It's a revolution propelled by the convergence and amplification of coming achievements in artificial intelligence, automation, and robotics, and amplified by the widespread connectedness of billions of people with mobile devices that provide unparalleled access to data and information. When AI is brought up in a classroom setting, it may be rather daunting. AI is commonly thought to relate to the collection and use of data. While this is true, the purpose of this article is to demystify the background and demonstrate the most practical ways in which language instructors may employ AI in the ELT classroom. The goal of this research is to show how successful AI-based instructional programmes are in teaching and learning English. It is impossible to prove effectiveness without putting it to the test in the real world. Digitalization has become an integral element of our daily lives. It is regarded as the world's unavoidable feature and driving force. Due to technology advancements and their applications, the world has achieved significant progress in a multitude of fields. Education, being one of the most important industries, has adopted a variety of techniques over time. In teaching and learning, trial and error are constantly present. In ELT classes, ICT (Information and Communications Technology)-based technology and gadgets have already been utilised. The most important and user-friendly AI-based strategies may help teachers make English language education more fascinating, interactive, dynamic, and joyful. It is certain that Artificial Intelligence would affect the entire educational system's view in the future.

## MOTION CONTROLLED ROBOT USING MULTISENSOR AND POWERED BY AI ENGINE

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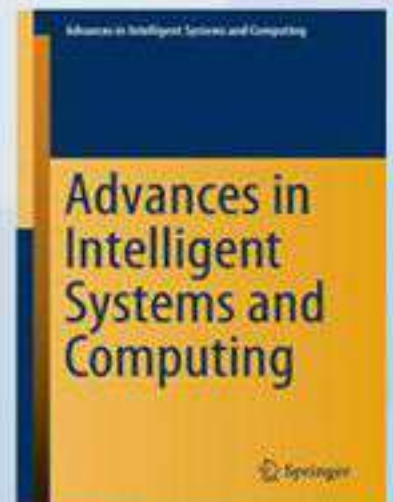
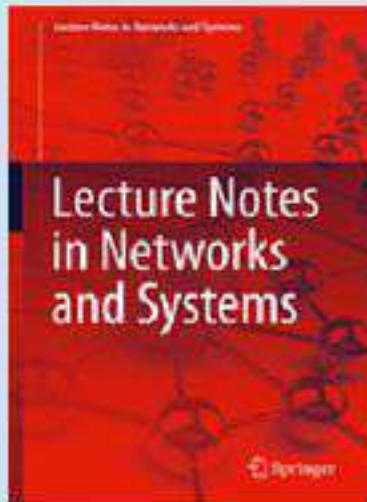
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**Abstract.** The main objective of our research is to design a motion controlled robot namely a wind mill robotic model to produce electricity in highways by movement of heavy vehicles. The electric energy consumption rate is increased day by day. Among the various renewable energy sources, wind and solar energy are vital energies. Wind energy is mainly used in generating power due to its generation cost. The term wind energy is a form of conventional, and it is available in affluence. Electricity is obtained with the help of a vertical axis wind turbine. Wind energy is the method where the wind is used to generate electricity. In this process, wind turbines convert the kinetic energy present in the wind into mechanical power into electricity. In this, the windmills are specially designed, and they are placed in between the divider on highways. The turbines are designed and fabricated based on the speculations the blades used in the turbines are semi-circular shape, and they are connected to the disc that is then connected to the shaft. The generated energy is stored on the battery for further usage.



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