Swami Keshvanand Ji
(1883 - 1972)

SWAMI KESHVANAND, one of the great visionaries of India and an enlightened philosopher, was born in Magloona, Sikar. He was a multifaceted personality and lived a life which was an amalgamation of various roles - a freedom fighter, a reformer, an educationist. He was inducted in the Udasin sect as a saint and it was here at the Udasin Sadhu Ashram, Fazlika, that he became proficient in languages like Hindi, Sanskrit and Punjabi. Despite having no formal education, he became an inspiration to educators worldwide by opening 300 schools, 50 hostels and numerous libraries, museums and social service centres. He was a champion of women's education and revived the Sangaria Vidyapeeth. He believed that Hindi alone had the strength to unite the country and propagated it by founding the Nagari Pracharini Sabha at Abohar. He also organised the 30th All India Hindi Sahitya Sammelan in 1941 and was honoured with the Sahitya Vachaspati award.

Profoundly moved by the Jalian-Wala Bagh massacre, he joined the Indian independence movement led by Gandhi ji and was put in charge of Congress activities at Ferozpur.

He was also a crusader for social justice and it was his lifelong endeavour to eradicate the social evils of untouchability, child marriage, illiteracy and backwardness from rural areas. A liberator, a philanthropist and a prophet whose conviction was " After the British leave India, the illiterate and ignorant masses of this country will become slaves of a few educated Indians. True freedom could become available to every Indian only if they got freedom from ignorance and illiteracy". Swamiji was also a firm believer in communal harmony.

Having led an exemplary life, Swami ji left for his heavenly abode in 1972. But his noble deeds remain a testimony to his great legacy and continue to inspire us long after his death.

6th International Conference on
Emerging Technologies in Computer Engineering:
Industrial IoT and Cyber Physical Systems
(ICETCE-2023), February 03-04, 2023

6th

International Conference

on

"Emerging Technologies in Computer Engineering: Industrial IoT and Cyber Physical Systems"

(*ICETCE-2023*)

03rd – 04th February, 2023

Organized By:

Swami Keshvanand Institute of Technology, Management & Gramothan, Jaipur

Venue:

Department of Computer Science & Engineering (NBA Accredited)

Swami Keshvanand Institute of Technology, Management & Gramothan, Jaipur-302017

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EDITORIAL BOARD

MESSAGE

Shri Surja Ram Meel
Chairman
SKIT, Jaipur
Rajasthan, India

It gives me immense pleasure that SKIT is organizing 6th International Conference on Emerging Technologies in Computer Engineering: Industrial IoT and Cyber Physical Systems (ICETCE-2023) on 03rd-04th Feb, 2023 which is hosted by Computer Science Engineering Department, SKIT, Jaipur.

The title reflects the evolution and progress in the field of intelligent systems. This year's theme of the conference provides a global assembly for exchange of knowledge and information on the frontier research, the latest development in the areas like machine learning, data analytics, communication etc. The use of present theme in computer science provides good opportunities for start-ups, industries for architecting intelligent applications and also provides individuals as a researcher to explore new ideas.

SKIT College aims to promote the young students paving way for immense success through a wide spectrum of activities in the campus. This International Conference provides a common platform for researchers, academicians, students and industrialists to exchange their areas of research and development. I hope that all the participant of this conference will have very pleasant and enjoyable experience in this event. I congratulate all the participants of ICETCE-2023 for their golden future and successful career. SKIT Family would like you to carry sweet memories of ICETCE-2023 and I wish this two-day International Conference all Success.

Surja Ram Meel
(Chairman)

MESSAGE

ShriJaipalMeel
Director
SKIT, Jaipur
Rajasthan, India

I am glad to know that department of Computer Science & Engineering is organizing International Conference on 6th International Conference on Emerging Technologies in Computer Engineering: Industrial IoT and Cyber Physical Systems (ICETCE-2023) on 03rd-04th Feb, 2023.

Such conferences are organized to dispense latent and innovative ideas, extremely helpful for the researchers, scholars and academicians in the field of computer engineering. These kind of conference provides a good platform for the researchers to showcase their ability and endeavors done towards the technological enhancement.

I extend my heartiest wishes for a grand success of the conference.

(Mr. JaipalMeel)

MESSAGE

Prof. (Dr.) S. L. Surana
Director (Academics)
SKIT, Jaipur
Rajasthan, India

On behalf of the ICETCE-2023 organizing committee, I am honored and delighted to welcome you to the 6th International Conference on Emerging Technologies in Computer Engineering: Industrial IoT and Cyber Physical Systems. It is quite gratifying to note that the department of Computer Science & Engineering is hosting its international conference with the association of Springer.

In this emerging digital world organizing such kind of conference, enforces us to exchange new technological ideas and develops an environment to showcase our evolution in the field of digital world. I wish the conference would be able to deliberate on current issues particularly in the field of machine learning, data analytics, networking etc. The technical program is rich and varied with keynote speech, invited talks and around 46 technical papers.

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

S. L. Surana

(Dr. S. L. Surana)

MESSAGE

Prof. (Dr.) Ramesh Kumar Pachar
Principal
SKIT, Jaipur
Rajasthan, India

On behalf of myself and ICETCE-2023 Committee, welcome to the 6th International Conference on Emerging Technologies in Computer Engineering: Industrial IoT and Cyber Physical Systems which focuses on advanced research and current trends in machine learning, networking and data analytics.

This conference will provide a forum for sharing insights, research experiences and various new techniques developed in the field of digital world. It is really good that such Conferences are held to enhance the spirit of innovation among Faculty Members, Research Scholars and Students. The technical sessions and papers to be presented will provide ongoing research trends and will encourage the academicians for the betterment of society, humans through technological advancements.

I truly hope that ICETCE-2023 conference meets your personal and professional expectations and wish a grand success of the conference.

(Dr. Ramesh Kumar Pachar)

About the Institute

Swami Keshvanand Institute of Technology, Management & Gramothan (SKIT) inspired from the learnings of Swami Keshvanand, was established in the year 2000 by Technocrats and Managers Society for Advanced Learning. Today the Institute is recognized as one of the centers of academic excellence in Northern India. The Institute is affiliated to Rajasthan Technical University, Kota for offering Postgraduate and Graduate Courses in Engineering and Management. Our sister institution Swami Keshvanand Institute of Pharmacy (SKIP) is affiliated to Rajasthan University of Health Sciences for offering Graduate Course in Pharmacy.

Located in the Pink City Jaipur, which is a blend of traditional history and modern outlook, SKIT is putting in efforts for making industry ready engineers and managers through effective Industry – Institute Interface. Apart from University curriculum SKIT also pursues activities for research and development in various fields.

The green landscaping, aesthetic elegance of arches and the vibrant pursuit of knowledge by the young aspirants make the environment serene, pleasant and dynamic.

Students joining the institute share the box full of opportunities for professional and personal development through an environment of practical orientation, industrial interaction and student led activities which help the students to develop good communication skills, integrated personality and greater competitive spirit.

Our Inspiration

"Mass illiteracy is the root cause behind backwardness of India. If we want speedy progress of Nation, we need to root it out as early as possible."

– Swami Keshvanand

Swami Keshvanand, an orphan, illiterate, nomadic man who never received formal education, was the founder of more than 300 schools, 50 hostels and innumerable libraries, social service centers and museums. Swami Keshvanand had a deep understanding of the rural society of the desert region. He had explained the peculiarities of the desert region, identified the problems and suggested appropriate and logical solutions. It was Swami Keshvanand's lifelong endeavour to eradicate social evils like untouchability, illiteracy, child marriage, indebtedness, poverty, backwardness, alcohol abuse, moral dissipation etc.

Vision:-

To promote higher learning in advanced technology and industrial research to make our country a global player.

Mission:-

To promote quality education, training and research in the field of Engineering by establishing effective interface with industry and to encourage faculty to undertake industry sponsored projects for students.

Quality Policy:-

We are committed to 'achievement of quality' as an integral part of our institutional policy by continuous self-evaluation and striving to improve ourselves.

Institute would pursue quality in

• All its endeavours like admissions, teaching- learning processes, examinations, extra and co-curricular activities, industry institution interaction, research & development, continuing education, and consultancy.

• Functional areas like teaching departments, Training & Placement Cell, library, administrative office, accounts office, hostels, canteen, security services, transport, maintenance section and all other services."

About the Department of Computer Science & Engineering

The Department of Computer Science & Engineering is a proud achiever of accreditation from NBA, a government body that guarantees our quality of education and academic services.

Accreditation is a quality assurance parameter of educational institutes that requires the institute to satisfy standard criteria of academic quality. It brings out the strengths and weaknesses of the institute and helps it to improve them further.

This accreditation is a confidence building factor for guardians of prospective students that their ward will experience an intensive teaching environment as per the best practices and standards. It is also a message to the recruiters that the students passing out through this program have competence based upon strong inputs.

About the Conference

6th International Conference on Emerging Technologies in Computer Engineering: Industrial IoT and Cyber Physical Systems (ICETCE-2023) is being organized by Department of Computer Science Engineering of Swami Keshvanand Institute of Technology, Management & Gramothan (SKIT), Jaipur, India on 03rd-04th Feb, 2023. The aim of the conference is to bring together the academicians, researchers, and industrial professionals to discuss and exchange their knowledge, innovative ideas, latest issues, advanced technologies, and advancements in the area of intelligent data analysis and related applications that will be presented in the conference. This conference will act as an International platform to share and demonstrate the novel approaches, development, technology improvement and research among interested researchers, students, developers, and practitioners. The conference invites and encourages the submissions in terms of concepts, surveys, state-of-art original and unpublished research, running implementation, applications, industrial case-studies and in progress research that can be categorized among regular and poster papers. The conference will be having many plenary and invited key note talks by the international reputed speakers covering the latest topic of wide range of interested researchers.

The conference will provide a platform for Computing, information technology and communication professionals to discuss current and upcoming developments in emerging areas. In addition to academics, researchers and government officials from around Rajasthan, the conference is expected to attract a wide audience from many sectors. A comprehensive range of cutting-edge theoretical and practical computing breakthroughs will be discussed in keynote addresses, research papers, seminars, tutorials and invited presentations at the conference. Multidisciplinary applications and solutions to real-world challenges such as secure data storage and management, Interoperability, Industrial espionage/sabotage etc. will be greatly welcomed.

The ICETCE conference aims to showcase advanced technologies, techniques, innovations and equipments in Computer Engineering. It provides a platform for researchers, scholars, experts, technicians, government officials and industry personnel from all over the world to discuss and share their valuable ideas and experiences.

Executive Committee

GENERAL CHAIR

- Prof. Seeram Ramakrishna, Vice President Research Strategy, Professor, Faculty of Engineering National University of Singapore (NUS), Singapore.

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- Prof. Samira Hosseini, Director of Writing Lab (IFE) & Professor (EIC) Tecnológico de Monterrey, Mexico.
- Dr. Hari Prabhat Gupta, Associate Professor, Department of Computer Science and Engineering, Indian Institute of Technology, BHU, India.
- Dr. Pankaj Dadheech, Associate Professor, Department of Computer Science & Engineering, SKIT, Jaipur, India.
- Dr. Mehul Mahrishi, Associate Professor Department of Information Technology, SKIT, Jaipur, India.

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- Prof. G. R. Sinha, International Institute of Information Technology (IIIT), Bangalore, IEEE Executive Council Member, MP Subsection, India.

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- Ms. Priyanka Bhardwaj, Associate Professor, Department of Computer Science & Engineering, SKIT, Jaipur, India.

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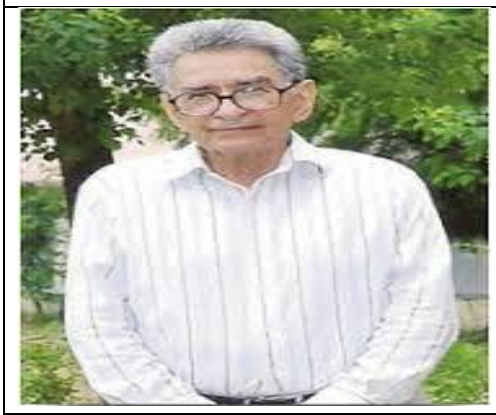
- Prof. (Dr.) Dinesh Goyal, Principal & Director (Academics), PIET.
- Prof. (Dr.) Reena Dadhich, HOD, Department of Computer Science & Informatics, University of Kota, Rajasthan.
- Dr. Arvind K. Sharma, Assistant Professor (CS), University of Kota, Rajasthan.
- Dr. Ramesh C. Poonia, Associate Professor (CS), AIIT, Amity University, Rajasthan.

- Dr. Vijendra Singh, North Carolina University, India.
- Mr. Mahesh Pareek, Programming Officer, ONGC, New Delhi Area, India.
- Ms. Kamaljeet Kaur, Campus Connect and Agile, ETA, Chandigarh DC, Infosys Ltd.
- Mr. Rupesh Jain, Practice Manager, Wipro Technologies Ltd.
- Dr. Gaurav Singhal, Assistant Professor, Bennett University, Greater Noida.
- Dr. Lokesh Sharma, Assistant Professor, Galgotia University, Greater Noida.
- Dr. Ankit Vidhyarthi, Department of Computer Science and Engineering, Bennett University, Greater Noida.
- Dr. Vikas Tripathi, Assistant Professor, Graphic Era University, Dehradun.
- Dr. Prakash Choudhary, Department of Computer Science and Engineering, NIT Manipur, Manipur, India.
- Dr. Smita Naval, Department of Computer Science, IIIT Kota.
- Dr. Subhash Panwar, Government Engineering College, Bikaner, India.
- Ms. Richa Jain, Assistant Professor, Banasthali University, Newai, Tonk.
- Prof. Binay Kumar Pandey, Assistant Professor, Govind Ballabh Pant University of Agriculture and Technology, Uttarakhand, India.
- Mr. Pankaj Jain, Assistant Professor, JECRC University.
- Dr. Digvijay Pandey, Senior Lecturer, Department of Technical Education Kanpur, Uttar Pradesh, India.
- Mr. Gaurav Meena, Assistant Professor, Central University of Rajasthan.
- Dr. Manoj Bohra, Associate Professor, Manipal University, India.
- Mr. Vishnu Kumar Prajapati, Lecturer, Govt. Polytechnic College, Sheopur, M.P., India.
- Dr. Madan Mohan Agarwal, Associate Professor, Birla Institute of Technology.
- Dr. Ajay Khunteta, Professor, Poornima College of Engineering, Jaipur.
- Sh. Subhash Gupta, Associate Professor, Birla Institute of Technology.
- Mr. Devendra Gupta, Lecturer, Govt. Polytechnic College Tonk.
- Dr. Baldev Singh, Professor, Vivekanand Institute of Technology.
- Dr. Vikas Tripathi, Assistant Professor, Graphic Era University, Dehradun.
- Dr. Rahul Dubey, Assistant Professor, Madhav Institute of Technology and Science, Gwalior.
- Dr. Smita Agarwal, Associate Professor, Global Institute of Technology.
- Dr. Sonal Jain, Associate Professor, Department of Computer Science, JK Lakshmipat University.
- Dr. Manmohan Singh, Professor, Department of Computer Science and engineering, Chameli Devi Group of Institution, Indore.
- Mr. Shrawan Ram, Associate Professor, MBM Engineering College, Jodhpur.

6th International Conference on

Emerging Technologies in Computer Engineering:
Industrial IoT and Cyber Physical Systems

KEYNOTE SPEAKERS

		
PROF. SEERAM RAMAKRISHNA Vice President Research Strategy, NUS, Singapore	**PROF. ARUN K SOMANI** Anson Marston Distinguished Prof. Sproul Professor of Electrical and Computer Engineering Associate Dean for Research and Graduate Programs Lowa State University, Ames,	**DR. GANESH R. SINHA** International Institute of Information Technology (IIIT), Bangalore, India
		
DR. GHASI RAM VERMA Professor Emeritus, University of Rhode Island, US	**DR. CHHAGAN LAL** Postdoctoral Research Fellow at Università degli Studi di Padova Padova, Veneto, Italy	**PROF. VALENTINA E. BALAS** the Department of Automatics and Applied Software at the Faculty of Engineering, "Aurel Vlaicu" University of Arad, Romania
		
DR. TARUN KUMAR SHARMA Professor, Dean, Department of Computer Science & Engineering, School of Engineering and Technology, Shobhit University, Gangoh, Saharanpur, India	**DR. KAILASH KUMAR** Assistant Professor, College of Computing and Informatics, Saudi Electronic University, Riyadh-11673, Kingdom of Saudi Arabia.	**DR. SUMIT SRIVASTAVA** Professor, Manipal University Jaipur & Senior Member, IEEE Delhi Section.

Department of Computer Science and Engineering
Swami Keshvanand Institute of Technology, Management and Gramothan (SKIT), Jaipur

6th International Conference on
Emerging Technologies in Computer Engineering:
Industrial IoT and Cyber Physical Systems

Program Schedule

DAY-1 (03rd February 2023), FRIDAY

INAUGURAL CEREMONY **WebEx Link (Panelist): https://skitjaipur.webex.com/skitjaipur/onstage/g.php?MTID=e2b42ac65a376fc827db4ff4633b2d3e0** **WebEx Link (Attendee): https://skitjaipur.webex.com/skitjaipur/onstage/g.php?MTID=ec98ccee852b5e36c4c0aed3529383cc2**	
9:00 am - 09:05 am	Inauguration
9:05 am - 09:10 am	Welcome Note by **Shri Jaipal Meel** - Director, SKIT, Jaipur
9:10 am - 09:15 am	ICETCE 2023 – The Journey by **Technical Program Chair Prof. (Dr.) Arun K. Somani,** College of Engineering, Iowa State University, Ames, USA.
09:15 am - 09:25 am	Conference Introductory Speech by **Prof. (Dr.) Anil Chaudhary**, Organizing Chair, ICETCE-2023
09:25 am – 09:35 am	Motivational Talk by **Guest of Honor Ms. Mona Bharadwaj**, Global University Programs - India Leader at IBM Research
09:35 am – 09:40 am	Motivational Talk by **Guest of Honor Ms. Kamaljeet Kaur**, Principal Consultant- Learning, Infosys
09:40 am – 09:50 am	Motivational Talk by **Guest of Honor Ms. Nivedita Sharma**, Cloud Specialist, Microsoft
09:50 am - 10:00 am	Motivational Talk by **Guest of Honor Dr. Mani Madhukar**, Program Manager, Global University Programs, IBM Research
10:00 am – 10:10 am	Motivational Talk by **Prof. Seeram Ramakrishna**, General Chair, ICETCE-2023
10:10 am - 10:15 am	Vote of Thanks by **Prof. (Dr). C. M. Choudhary,** Organizing Chair, ICETCE-2023
TECHNICAL SESSIONS	
Track-1 10:30 AM IST Onwards	**Track-1: Industrial IoT** **Keynote (10:30 am - 11:00 am): Prof. Seeram Ramakrishna**, Vice President Research Strategy, Professor, Faculty of Engineering National University of Singapore (NUS)**.** **Keynote (11:00 am - 11:30 am): Dr. Amit Barve**, Associate Professor and Head, Department of Computer Engineering, Parul Institute of Engineering & Technology Parul University Vadodara. Technical Session Chair: **Dr. Rajiv Singh**, Associate Professor, Department of Computer Science, Banasthali Vidyapith, Rajasthan, India. **Dr. Priyanka Harjule,** Assistant Professor, Malaviya National Institute of Technology, Jaipur. Session Coordinator(s): **Ms. Shalini Sighal, Ms. Neha Mathur, Ms. Anjali Pandey** **Google Meet Link: https://meet.google.com/kxf-mara-wgs?hs=224**
Track-2 10:30 AM IST Onwards	**Track-2: Cyber Physical Systems** **Keynote (10:30 am - 11:00 am): Dr. Hari Prabhat Gupta, Indian Institute of Technology, IIT BHU** Technical Session Chair: **Dr. Mithlesh Arya**, Poornima College of Engineering, Jaipur, Rajasthan, India **Dr. Swati Nigam**, Assistant Professor, Department of Computer Science, Banasthali Vidyapith, Rajasthan, India. Session Coordinator(s): **Dr. Meenakshi Nawal, Ms. Nikhar Bhatnagar, Ms. Shalini Pathak** **Google Meet Link: https://meet.google.com/hjw-tcrc-ofg**
Track-3 10:30 AM IST Onwards	**Track-3: Machine Learning and Applications** **Keynote (10:30 am - 11:00 am): Dr. Sumit Srivastava**, Professor, Manipal University Jaipur & Senior Member, IEEE Delhi Section. Technical Session Chair: **Dr. Digvijay Pandey,** Senior Lecturer, Department of Technical Education, Kanpur, Uttar Pradesh, India. **Dr. Binay Kumar Pandey**, Assistant Professor, Department of Information Technology, Govind Ballabh Pant University of Agriculture and Technology, Uttarakhand, India. **Dr. Ashima Shahi,** Professor, Department of Computer Science & Engineering, Vivekananda Global University, Jaipur. Session Coordinator(s): **Mr. Shirish Nagar, Ms. Rubal Deep Gill, Ms. Abha Jain** **Google Meet Link: https://meet.google.com/kwm-evrc-yfs**

6th International Conference on
Emerging Technologies in Computer Engineering:
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DAY-2 (04th February 2023), SATURDAY

Timings	Activities
TECHNICAL SESSIONS	
Track-4 9:00 AM IST Onwards	**Track-4: Cognitive Computing, Soft Computing** **Keynote (9:00 am - 09:30 am): Prof. (Dr.) Arun K. Somani**, Associate Dean for Research, College of Engineering, Iowa State University, Ames, USA. Technical Session Chair: **Dr. Bright Keswani,** Professor & Principal, Academic Staff College, Suresh Gyan Vihar University, Jaipur **Dr. Manju Kaushik,** Professor, Amity Institute of Information Technology (AIIT), Amity University, Rajasthan. **Dr. Vitthal Sadashiv Gutte**, Asst. Professor in School of Computer Engineering & Technology, MIT World Peace University, Pune, Maharashtra. Session Coordinator(s): **Ms. Shalini Sighal, Ms. Neha Mathur, Ms. Anjali Pandey** **Google Meet Link:** https://meet.google.com/vsg-jngt-kbh
Track-5 09:00 AM IST Onwards	**Track-5: Data Science & Big Data Analytics** **Keynote (9:00 am - 09:30 am): Dr. Priyadarsi Nanda,** Senior Lecturer, University of Technology Sydney (UTS), Australia. Technical Session Chair: **Prof. (Dr). Swapnesh Taterh,** Professor & Head, Amity Institute of Information Technology – AIIT, Amity University Rajasthan. **Dr. Yogesh Kumar Gupta,** Assistant Professor, Department of Computer Science, Banasthali Vidyapith, Newai (Rajasthan). Session Coordinator(s): **Dr. Meenakshi Nawal, Ms. Nikhar Bhatnagar, Ms. Shalini Pathak** **Google Meet Link:** https://meet.google.com/dzy-wpwq-aoc
Track-6 09:00 AM IST Onwards	**Track-6: Blockchain and Cyber Security** **Keynote (9:00 am - 09:30 am): Dr. Manju Khari,** Associate Professor, School of Computer and Systems Sciences, Jawaharlal Nehru University, Delhi, India Technical Session Chair: **Dr. Radhakrishna Bhat,** Assistant Professor, Dept. of Computer Science and Engineering, MIT, MAHE, Manipal, India **Dr. Charu Gupta,** Associate Professor, Department of Computer Science and Engineering, Bhagwan Parshuram Institute of Technology, New Delhi, India. Session Coordinator(s): **Mr. Shirish Nagar, Ms. Rubal Deep Gill, Ms. Abha Jain** **Google Meet Link:** https://meet.google.com/mno-kbqr-mqg
VALEDICTORY FUNCTION **WebEx Link (Panelist): https://skitjaipur.webex.com/skitjaipur/onstage/g.php?MTID=eb1be2c9d38587208313b78c66f65423c** **WebEx Link (Attendee): https://skitjaipur.webex.com/skitjaipur/onstage/g.php?MTID=e3d0f7cdedd31d338d8c6421c516fa9b2**	
12:00 Noon - 12:20 PM	Conference report by **Prof. Samira Hosseini,** TPC Chair and Adjunct Researcher, Nanodevices , School of Engineering and Sciences, Tecnológico de Monterrey.
12:20 pm – 12:30 pm	Announcement/ Distribution of Certificates (Best Paper Awards, Participation)
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An Intelligent Model for Early Fire Detection using IoT/ Lora in Smart City

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Abstract. The quotation "prevention is better than cure" holds appropriate about the Fires incidents. Usually fire start in the house due to carelessness and negligence. They create threats to the people residing and can cause human deaths. Therefore the fires in apartments or campus should be detected as early as possible to protect from such threats. Immediate notification of fire to fire extinguishers is the need of the hour. Fire alarm systems that usewireless sensor networks occasionally can no longer locate fires due to sensor failures andalso due to latency in multihop scenario in WSN. This paper uses an approach to collect the data from the sensors in single hop scenario on the gateway and then send them to the cloud and used it to predict fire using a Logistic regression model to make decisions on the server for early prediction and then give an alert in case of fire prediction to the user and fire agencies by using IFTTT (online digital automation platforms). The NodeMcu esp8266 wifi module with the Arduino Uno is used and connected multiple sensors for the prototype development and data collection is done. The model has 100% precision score over false prediction. The work will be extended for scalability using LoRaWAN technology and advanced machine learning model for fire prediction in smart city.

Keywords: Smart infrastructure, LoRaWAN, IoT, Logistic regression, IFTTT (online digital automation platforms).

Supervised Deep Learning Optimization Approach for the Small Vehicular Adhoc Objects

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Abstract. The objects of the vehicular network consist of the moving traffic which in view can be considered as very small objects with reference to the large environment. There are lot of different approaches used for the detection of objects but still there is a gap in finding the small objects and its tracking. To make the routing protocols vigorous to recurrent communication disruptions and also aware of un-stable traffic conditions, new routing techniques need to be integrated. This type of traffic is termed as Adhoc as it is not the static one, keeps on moving which makes the network temporary means Adhoc. In the proposed methodology, the presented approach is based on the supervised learning approach based on deep learning methodology. In the proposed work the Fast-CNN where the second polling layer is fed by the features extracted by the SVM (Support Vector Machine). The SVM is used to extract the desired parts from the noise and in parallel the features maps are obtained by applying the single stride on to the convolutional matrix. The SVM is the machine learning algorithm which extracts the desired parts from the undesired of the target very minutely. The purpose of the proposed work is to detect the very small objects from the large environment. The moving objects usually seem to be very small and difficult to easily track when the reference is considered large. The experimental work is performed using MATLAB 2021R software and the results are obtained in terms of accuracy and precious. The results obtained from the proposed methodology are compared with the previous approach and the present work outperforms the existing work.

Keywords: SVM, CNN, Image processing, Fast-CNN, Object detection.

Design of Energy Management Approach for Plug-in Hybrid Electric Vehicle using Optimized Deep Learning

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Abstract. A hybrid electric vehicle, often known as a HEV, is a product that has the potential to significantly mitigate issues with the current energy crisis as well as environmental pollution. Nevertheless, the cost of consumption will climb before the HEV reaches the end of its lifespan if such a battery needs to be replaced. Therefore, investigate on the multi-objective vigour organisation control delinquent, which goals to not minimise the ingesting of gasoline but also to prolong the life of the battery, is essential and stimulating for HEV. The goal of this research is to minimise the consumption of gasoline and expended electricity. hybrid electric vehicles (PHEVs) are the subject of the research presented in this article, which suggests a unique energy organisation technique with enhanced adaptation to varied conditions. The control settings are optimised offline for various driving scenarios after being resulting from the benchmark test. The improved parameters are applied in accordance with the various driving behaviours that were recognised online. The cooperation both offline and online increases the performance of the energy organisation approach under a variety of driving scenarios. There have been three primary efforts put forth: First, valuable features that describe different driving conditions are removed by Siamese networks, and then those features are used for determining driving illness categories, which are then utilised for online driving condition identification by Multi-Scale Capsule Network. Multi-Scale Capsule Network is a novel variation of capsule network that was developed to enhance the illustration capacity of capsule network. Second, the Artificial Plant Optimization Procedure (APOA) is used to optimise the control thresholds in the newly designed control strategy under a variety of driving situations. After a specific traffic condition has been characterised, an online calculation will be made to determine the control thresholds that are ideal for the various driving conditions. In conclusion, a simulation-based evaluation is carried out, which validates the improved performance of the suggested solutions in terms of energy savings across a variety of driving scenarios.

Keywords: Hybrid electric vehicle; Driving conditions; Multi-Scale Capsule Network; Siamese networks; Artificial Plant Optimization Algorithm.

A Review on the Investigation of Attacks on IIoT and their Probable Solutions

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Abstract. In current environment of Industrial Internet of Things (IIoT), diverse resources act together amid industries. The condition predicted via standards of Industry 4.0 leads to rising vulnerabilities; particularly as such systems accept data flows from numerous intermediaries. Due to the heterogeneity of things in the IIoT network and interoperability of software along with hardware, severe problems for the security of such systems crop up. Since the strengthening of industrial tools is a constraint that is associated with technological advancements through the utilization of IoT, it is imperative to recognize key vulnerabilities with allied risks plus related threats and figure out the probable solution. Their view supplies a narration of attacks adjacent to IIoT systems. A conservative scrutiny of solutions for the attacks is suggested.

Keywords: Cyber threats, Industry 4.0, IIoT, Attacks, Safety.

Developing an IoT-based Fog Computing Environment for Breast Cancer Disease Prediction

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Abstract. When resources like hospitals, ambulances, doctors, and other medical staff are scarce, the capacity to monitor and track a affected role health in an spare is vital since it may have a straight inspiration on a affected role life in a substance of seconds. Fog computing, which utilizes modest individual gadgets, can deliver lower latency than cloud computing. Healthcare organizations are investing in IoT-powered fog computing to enhance public services, which could save billions of lives. This cutting-edge computing platform, founded on the fog computing paradigm, has the potential to enhance the timeliness and precision with systems based on fog computing. When it comes to cancers affecting women, breast cancer is by far the worst. Using a computer to aid in a diagnosis is a very effective strategy that can greatly increase a patient's probability of survival when used in conjunction with a trained medical professional. Due to the delicate nature of medicine, it is essential to use AI in this sector. Cascaded convolutional neural networks are built in this work, with spider monkey optimization used to fine-tune the hyper-parameters of the proposed network (SMO). Patients can also set up alerts to help them remember to take medications on time or to eat healthily. The massive data set is being kept in the cloud for future reference by medical institutions and researchers. Based on the experimental results, it is clear that the projected work provides significant enhancements over the state-of-the-art stability.

Keywords: Healthcare; Internet of Thing; Artificial intelligence; Cascaded Convolutional Neural Network; Spider monkey optimization; Fog Computing.

IoT-Based Smart Air Quality and Waste Management System

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Abstract. In the present situation as the population is expanding slowly but surely, nature ought to be spotless and hygienic. In a large portion of urban communities, flooded rubbish containers make an unhealthy condition. Moreover, these garbage compartments lead to air pollution as they release sufficient amounts of unsafe gasses available such as CO2, smoke, liquor, benzene, and NH3. In order to monitor this situation we are proposing a model which is an IoT-based garbage and smart air quality (SAQ) monitoring system. We are in a period where frameworks are merged with IoT energy to have a more efficient working arrangement and to complete activities promptly. This paper will reflect on the facts of monitoring garbage quantity and air quality in a display that we have set to show, a web server will send a message utilizing the internet of identifying the presence of dangerous gasses in the atmosphere, smoke detection and alarm, and the amount of garbage inside the dustbin, as well as providing the data to the appropriate authorities.

Keywords: IoT, air quality monitor, HC-SR04 Ultrasonic Sensor, MQ-135 Air Quality Gas Sensor, ESP8266 WiFi module.

An Integration of E-Health Care System with Deep Forest Technique in Internet of Things

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Abstract. Internet of Things (IoT) has recently spread and integrated in the arena of healthcare devices and consumer electronic appliances, which has influenced the trend and way of numerous applications that aim to aid those who have difficulties maintaining self-governing living, such as those with attention deficit hyperactivity disorder (ADHD), a form of mental illness that frequently manifests in children. Classification of ADHD has been attempted using numerous machine learning strategies, including deep neural networks. Lately, the deep forest, also known as a gcForest, has shown exceptional performance on various imaging applications, making it a viable alternative to deep networks. This research, then, presents an e-health system based on the IoT and Fog computing, employing a modified gcForest, to track the behavioural and physiological data of people with ADHD. An Android app serving as the Fog server and the Mysignals HW V2 platform power this system, allowing for the periodic collection of physiological and other health-related data from users. Extracted from the fMRI data are the 1-D feature and the 3-D (ALFF) feature. We present an updated version of gcForest that use a multi-grained scanning structure to join the two features into a single one, yielding a new feature vector that is unique to each sample. In addition, we use the symbiotic organisms search (SOS) algorithm and the optimised synthetic minority over-sampling technique (SMOTE) to create synthetic minority concatenated feature vector samples to correct the imbalanced nature of ADHD data. Finally, the combined feature vector samples are input into a cascade forest for classification. The research uses the ADHD-200 data sets to test the suggested approach and assess its effectiveness on the hold-out testing data. The experimental results demonstration that our strategy outstrips the previously published approaches.

Keywords: Attention deficit hyperactivity disorder; Internet of Things; Amplitude of low frequency fluctuations; Symbiotic organisms search; Optimized synthetic minority over-sampling method.

A Novel Approach for Alpha Generation SDN-IoT Fostering DDoS Attacks

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Abstract. The Age alpha development in the world of web has arise the question on security after 2000s. The internet of Things(IoT) is confronting dissimilar network attacks. The alpha generation innovations used to moderate such attacks should be made do to invade the new distributed attacks. Henceforth proposing a technique to recognize and alleviate DDoS network attacks utilizing alpha age software defined network (SDN) and AI. SDN is a network computation that is utilized to screen and control the network traffic that assists dealing with the network assets. In the control system alpha learning models intended to characterize the traffic and from the starting point, the SDN controller will refresh the organization settings as needs be to moderate DDos attack. The traffic created from the applications is characterized by the AI classifier into harmless and malevolent classifications. Then, at that point, those characterized results will be shipped off to SDN controller which will either hinder egressing traffic or redirect the network settings to prevent the attacks.

Keywords: SDN, Learning classifier, DDoS, IoT .

An Artificial Intelligence-based Technique for Optimizing Electric Vehicles Performance

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Abstract. Due to the increasing demand for EVs around the world, there is a chance to build micro-grids and smart communities within the energy internet, based on the ability to switch and route vast amounts of energy efficiently. Smart EV charging is a potentially useful approach to managing EV charging loads, however it is dependent on making reliable predictions about future EV charging needs. The demand placed on power grids by electric vehicle charging fleets is projected to rise. Therefore, anticipating the load from EV fleets is critical for ensuring the continued security and dependability of the electrical grid. In this research, we introduce a novel hybrid Deep Learning charging forecasting model. We employ a hybrid model containing of a Convolutional Neural Network (CNN) and a Recurrent Neural Network-(RNN), where the hyper-parameters of the RNN are modified with a Novel Black Widow optimization approach (NBWOA). Model accuracy is checked against field-collected data sets of actual EV fleet charging times. By comparing the suggested model to the existing models, we can quantify the forecast presentation of the projected model using a number of statistical criteria. When compared to a lone deep learning strategy with no optimization model, it is shown that the hybrid approach is superior.

Keywords: Electric Vehicles; Fleet Load forecasting; Convolutional Neural Network; Deep Learning; Novel Black widow optimization algorithm; Recurrent Neural Network.

Terrorist Activity Story Chain Generation from Global Terrorism Database and Wikipedia

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Abstract. Terrorism is a grave humanitarian crisis that threatens global security. It poses serious challenges to policy-makers, organizations, and governments through numerous ideologies, objectives, actors, and tactics. Therefore, the development of efficient computational solutions to multiple facets of terrorism is a domain of active research around the world. However, as high levels of unpredictability and uncertainty characterize the basic traits of terrorist activities, attempts for the exploration of effective solutions have remained few and scattered. This paper proposes a new computational model based on an event classification ontology and story-chaining approach for forecasting the events of a vehicle ramming terrorist attack. As a work in progress, the paper confers over the mapping of different social events comprising a vehicle ramming terrorist attack and later links them together by use of story chains.

Keywords: Vehicle ramming, terrorist attack, story chain, ontology, Wikipedia.

Deep Learning based Network Intrusion Detection Systems: A Study

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Abstract. The transmitted data is increasing day by day which raises a security concern and IDS (intrusion detection system) is the only option which detect these security breaches. Thus, the importance of developing an effective IDS is also growing. Since Deep learning is an effective technique which easily cope up with large scale data thus modelling an IDS with deep learning technique is now-a- days gained attention of many researchers. This paper compares the different deep learning-based IDS based on feature selection technique, intrusion classification and detection technique, dataset use and finally the efficiency or accuracy of system. This analysis gives a brief overview of available deep learning architectures, the importance of choosing dataset and the importance of feature selection. The results highlight the areas where these IDS need improvement, and future study directions are also suggested.

Keywords: Intrusion Detection System, Attacks, Machine Learning, Deep Learning, Network Security

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A Comprehensive Survey on the Recent Trends of Cyber Security in the Healthcare Domain

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Abstract. Clinical treatment has relied more on computer technology over the past ten years. The delivery of safe, dependable, and appropriate healthcare now necessitates the use of cyber security for healthcare information networks. A thorough analysis of the literature on healthcare and healthcare delivery was the goal of this research. This article's objective is to examine the literature on the steps taken by healthcare organisations to safeguard patients' private information, how breaches and vulnerabilities happen, and the effects on those organisations. A comprehensive search for peer-reviewed English-language literature was conducted using Pub Med and Web of Science. Chronological analysis, domain clustering analysis, and text analysis were used to create a high-level idea map made up of specific words and the relationships between them. The significance of bolstering information technology (IT) systems in order to safeguard them from cyber-attacks. This article was mostly based on papers published between 2015 and 2020 on the topics of cyber security, cyber-attacks, healthcare facilities, and patient health information. Cyber-attacks are simple to carry out on devices with insecure IT or security systems.

Keywords: Cyber Security, Bolstering Information Technology, Attacks, Health Care, Vulnerabilities.

Emerging Role of Blockchain on Healthcare Management in COVID-19 and Beyond

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Abstract. The Healthcare industry is one of the largest and most heavily regulated industries demanding to benefit from the upscaling merits of blockchain technology accompanied by Artificial Intelligence and the Internet of things. The study focused on the relevance of blockchain technology in healthcare units in contrast to the traditional non-transparent cumbersome operations of the industry. The use cases developed in industry and academia are also discussed to corroborate the evidence of the study. The chapter showcased the instrumentality of blockchain technology in pandemic situations and how similar war-like scenarios can be tackled by the utilization of the benefits of the technology and concluded with the opportunities and challenges of blockchain technology in the healthcare industry.

Keywords: Blockchain, Healthcare, Pandemic, Internet of things

An Analysis of Vulnerabilities and Security Aspects of Docker Containers

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Abstract: Docker is one of the most popular containerization platforms for building, shipping, and running applications in containers as it provides a lightweight and efficient way of packaging and distributing software applications. It has been the most popular containerization solution since its introduction in 2013, owing to its portability, smooth deployment, and setup. However, with its widespread use comes the need for understanding and addressing the security risks and vulnerabilities associated with Docker. This paper explores the security risks associated with Docker and the steps that can be taken to mitigate them. The vulnerabilities that can arise due to improper configuration, weak passwords, and unpatched software are discussed in detail. Additionally, this paper also discusses the measures that can be taken to secure Docker containers, such as using strong passwords, regularly updating the software, and implementing access controls. Furthermore, the paper highlights the importance of security tools and techniques that can be used by different organizations to effectively protect Docker environments from potential security threats.

Keywords: Containers, Security, Docker, Virtualization, Vulnerabilities, Risks, Measures, Attacks.

Game-Theoretic Approach to Cybersecurity: A Bibliometric Analysis

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Abstract. Cyber Security is a primary concern today in the digital world. Abundant literature is available in this domain, tackling various cyber threats. As technology advances, cyber-attacks get complicated Making prevention detection and reacting to threats complex with attack-specific solutions. Hence, A holistic approach to cyber security is necessary. Game theory is one of the holistic approaches practised in cyber security. Therefore, this work runs a bibliometric analysis of the literature on game theory in cyber security published between 2016 and 3rd January 2022. One thousand one hundred fifty-four (1154) documents on the game theoretic approach to cybersecurity collected from the SCOPUS database were analysed. In this study, game theory was the most frequent keyword, followed by security, Nash-equilibrium, and network security. The present growth trends suggest a considerable increase in the number of publications globally on the game-theoretic approach to cybersecurity. China has made a tremendous amount of contribution to this critical field. The application of Stackelberg games, Evolutionary Game theory, and holistic cyber-defence systems have high scope for future research.

Keywords: Bibliometric analysis, game theory, cybersecurity, network security, Internet of Things.

Hybrid SVM-HHO Model is a Successive Tool for Flood Prediction: A Case Study

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Abstract. Flood events can cause devastation in heavily inhabited areas along rivers; thus, obtaining longer forecasts with superior accurateness is vital to protect public and assets. A soft computing approach is presented for the prediction of floods in the Mahanadi River basin, Odisha. River Mahanadi is a major eastward flowing river in the Indian Peninsula that originates in Chhattisgarh before entering Odisha. During the monsoon season, many regions where the river flows through in Odisha experience severe floods. This makes flood forecasting essential for mitigation and proper management of the watershed. For this purpose, Support Vector Machine (SVM) model and a metaheuristic algorithm known as Harris Hawks Optimization has been incorporated. 20 years of statistical data was utilised to train and test the model. The model's reliability was evaluated using Root Mean Square Error (RMSE), Willmott Index (WI), and Co-efficient of Determination (R^2) as performance indicators. It was concluded from results that proposed hybrid model produced superior results when compared against the conventional model.

Keywords: SVM, SVM-HHO, Mahanadi River, Flood.

Support Vector Machine Kernel Selection for Heart Disease Prediction

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Abstract. Heart disease refers to a range of illnesses that impact the heart or the blood vessels in humans. Although heart disease prediction is a very demanding and difficult issue, it is possible by employing advanced Machine Learning (ML) approaches. If the heart disease is identified early, it is easier to cure. Many instances demonstrated that heart disease may not be discovered until a person notices some physical symptoms. In this context, for providing feasible solutions, the Support Vector Machine (SVM) has played a critical role for heart disease prediction problems. However, the feasibility of implementing SVM is affected by the issues in selecting a suitable kernel and its parameters. From this perspective, this study efforts to employ four distinct kernels, including linear, polynomial, Radial Basis Function (RBF) and sigmoid kernel of SVM in Cleveland heart disease dataset of UCI (University of California Irvin) machine learning repository to determine which kernel is the best for predicting heart disease more accurately. The experimental finding shows that RBF obtains more accuracy on the given dataset.

Keywords: Heart Disease, Machine Learning (ML), Support Vector Machine (SVM), Kernel Functions, Disease Prediction.

Image-Based Plant Leaf Disease Detection and Classification Using Deep Learning Models

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Abstract—Early detection of plant leaf diseases is beneficial as it helps agriculturists to apply remedial measures well in advance. This is highly recommended for a good yield from crops, which enhances the economy of an agriculture-based country. In the field of precision agriculture, early detection of plant leaf diseases can be accomplished through deep learning and computer vision techniques. Literature proclaim that deep learning models give better accuracy when compared to machine learning approaches for classification of leaf diseases. In this paper, the different deep learning techniques are applied on banana leaf dataset for detection and classification. The AlexNet, VGG19, DenseNet201, ResNet50, and MobileNetV2 CNN are the models compared in this work. The images of banana leaves, collected from farm fields are used to train and test these models' using python. Healthy and two common diseases of banana leaves are classified in this work. After data augmentation and preprocessing, all the models could achieve good testing accuracies of more than 90.6% in the 80-10-10 training-validation-testing set.

Keywords: Plant Disease, Image Pre-processing, Data Augmentation, Computer Vision, Deep Learning.

An Efficient Keyframe Generation Method for Human Motion Detection

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Abstract. Tracking moving objects from the surveillance video is one the challenging task, due to the quality of the video**.** As surveillance camera is placed everywhere, Smart detection of human motion attracts researchers to design robust video surveillance algorithms. While detecting human action from video, frames play a very important role. Various researchers already focused on frame selection algorithms. But most of the algorithm converts the video into redundant frames. This proposed work mainly focuses on keyframe extraction. As input for the proposed work is Video, it's necessary to convert video into frames. One of the challenging tasks is selecting appropriate frames from the video. When we extract a frame from a video, there is a possibility of duplication. The process of removing duplicate frames is called a keyframe. Also, the keyframe makes the video sequences for faster pre-processing If the length of the video is more, then identifying the best keyframe is a challenging task. This paper focuses on Efficient Keyframe Generation (EKG) which helps to detect the frame in which best frame of human is available.

Keywords: Keyframes, video, Recall, Precision, Gradient Based Edge Detection.

Pashmina Embroidery Classification Using Transfer Learning

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Abstract. The exquisite display of craftsmanship in the design and embroidery of Pashmina products give them a unique antique look quite distinctive from other artworks. However, the general population lacks the expertise in recognizing the intricacies of Pashmina product design and embroidery. An expert system which can automatically identify different Pashmina shawls based on their embroidery works could help spread awareness about this unique and native product. In this study, we developed a deep learning model to identify Pashmina Shawls on the basis of designs and embroidery woven on them. We adopted convolutional neural network architecture and trained it to recognize various types of Pashmina shawls. The results of experimentation on a collected dataset with data augmentation demonstrated that our proposed approach can be efficiently used for Pashmina embroidery classification with a classification accuracy of 92.60%. Our proposed model provides an automatic identification and classification mechanism which would be helpful in the Pashmina industry.

Keywords: Pashmina, Image Classification, Deep Learning, Transfer Learning

Machine Learning-Based System for Movie Recommendations

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Abstract. In today's society, recommendation systems are critical. Because there is a huge amount of data all around us, whether it is music, book, or movie data; as a result, numerous programs or businesses, including Netflix, Amazon, and Spotify, focus on recommendation systems (Music apps). Systems for recommending movies to view at the movies are intended to assist moviegoers by reducing the need for them to choose from a large variety of films that may number in the thousands or even millions. With the help of the movie lens dataset, this work aims to conduct a study to analyze the effectiveness of machine learning techniques, like KNN, XG-Boost algorithms with Pearson Correlation Coefficient, and Count Vectorizer model. The performances of proposed systems are evaluated in this study using the RMSE (root mean square value) and RMSE of 1.1062 and 1.1089 is achieved using KNN and XG-Boost algorithm respectively.

Keywords: KNN, RMSE, XG-Boost, MAPE.

Selection of Features using Biological Optimization Algorithm with Machine Learning for Thyroid Disease Classification

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Abstract. Peripheral glandular tissue abnormality is a hallmark of thyroid illness. Hyperthyroidism (overactive thyroid) and hypothyroidism (underactive thyroid) are the two most frequent forms of thyroid disease, which result from the gland's abnormally high or insufficient production of hormones. The penalty area of this study was to improve the identification of thyroid disorders by developing a homogeneous machine learning strategy that makes use of feature-selection methodologies. When applied to the healthcare industry, Machine Learning (ML) can greatly improve the accuracy with which jobs like illness risk prediction are performed, thereby benefiting the people in the communities they are implemented in. According to the research studies, there is still a probability of 12% inaccuracy in the analysis of diseases by the medical practitioners. A unique Electric fish optimization (EFO) Feature Selection perfect is proposed to extract the most significant characteristics, which are strongly contributing, with the goal of reducing the error rate and further improving the presentation. Instead of relying solely on accuracy, we also take into account Area Under Curve (AUC) and other assessment measures because inaccurate predictions for unbalanced datasets might lead to harmful medical outcomes. In this case, we use the UCI ML mine's thyroid illness dataset. In addition to the EFO model, this research uses Select From Model (SFM) and Tree Based Feature Selection to identify the top features that contribute to the model, which are then matched with the ML method XGBoost. The proposed EFO-XGBoost model has an absolute maximum accuracy of 94.66% and a precision of 95%.

Keywords: Thyroid disease; Machine Learning; Electric fish optimization; Tree Based Feature Selection; XGBoost.

Conceptual framework for the Intention to Quit (ITQ) inHospitality Industry

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Abstract. This study investigates factors influencing ITQ (Intention to Quit). Using organizational culture, HRM policies and practices, and leadership as theoretical frameworks, this study will examine service sabotage, job satisfaction, and desire to leave among frontline employees in the Indian hotel industry (drivers). As an ITQ mediator, job happiness is important. Design/methodology/approach This cross-sectional survey uses many waves to collect data twice. India's hotels and eateries have agreed to test the study'sproposals. Statistical Product and Service Solutions evaluated the latest sample (SPSS). Leadership, organizational culture, and human resource management (HRM) policies and practices all affect employment outcomes, according to study. Happiness at work correlates strongly with positive employment outcomes. This study adds to existing literature in two ways. First, it studies how leadership, organizational culture, HRM policiesand practices, and other factors affect frontline hospitality staff job outcomes. Then, it conceptualizes and executes experiments to test these hypotheses. Second, this is the first study in the Indian hotel industry to examine the link between organizational culture, HRM policies and practices, effective leadership, and high work satisfaction.

Keywords: Organizational Culture, HRM Policies & Practices, Leadership, JobSatisfaction, ITQ (Intention to Quit).

A Comparative Study of KNN Implementation for Breast Cancer Dataset using scikit-learn and numpy library

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Abstract. Many Machines Learning (ML) methods are there that are used for estimate of breast cancer cell. Algorithms used for Data mining are very significant for the guess of early-stage breast cancer. Division of ccells into benign and malignant sets is a present problem of research. ML is famous and used for classification problem of breast cancer cells. It is used for sensing present unseen uniformities and forms in many datasets. Breast cancer classification is a significant problem in cancer research, and ML methods are extensively used for this task. In this study, we conducted a performance comparison of two K-nearest neighbor (KNN) algorithms for breast cancer classification: a built-in KNN implementation in scikit-learn and a custom KNN implementation using numpy. We used the Breast Cancer dataset from scikit-learn to calculate the accuracy, time of execution and CPU utilization of the two algorithms. Our results showed that both KNN implementations had similar accuracy, with the built-in implementation achieving an accuracy of 94.73%. However, the built-in implementation had considerably less execution time and CPU utilization as compared to the custom implementation. Execution Time required to execute the built-in KNN algorithm is very less i.e., 0.034 millisecond. Execution Time required to execute KNN algorithm constructed using Python numpy code takes 0.58 millisecond. These results suggest that the built-in KNN implementation in scikit-learn is a suitable choice for breast cancer classification tasks, particularly in production environments where efficiency is a concern.

Keywords: KNN, scikit-learn, numpy, classification, Machine Learning.

Prediction of Crop Yield for Cultivation Relying on Soil and Environmental Traits using Numerous Feature Selection Methodologies

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Abstract. In order to maintain food security and to satisfy the hunger needs of billions of people, agriculture serves as the foundation of the Indian economy. Crop cultivation used to be done based on the practical experience of farmers. Farmers were farming the same crops over and over again without attempting new varieties, and they were dousing their fields with fertilizer in arbitrary amounts without knowing how much of it was deficient. Additionally, crop production has already started to suffer from climate change. Improving crop output is consequently viewed as an important component of agriculture because agronomists are impotent to select the appropriate crop(s) depending on environmental and soil parameters, and the mechanism of forecasting the selection of the appropriate crops manually has failed. Crop productivity is boosted as a result of accurate crop prediction. This is where machine learning in the field of crop prediction comes into play. The soil type, temperature, humidity, geographic location, and climatic characteristics all affect crop forecast. An integral aspect of the forecasting process used by feature selection methods is choosing the proper features for the right crop or crops. The post here addresses agricultural issues by keeping an eye on the industry and assisting farmers in sharply raising productivity, profit margins, and cutting losses. This paper uses categorization approaches to recommend the appropriate crop or crops for the area and conducts a comparison research of multiple wrapper feature selection techniques.

Keywords: Precision Agriculture, Crop prediction, Machine learning, Classification, Feature Selection, Recursive Feature Elimination.

Feature Selection and Machine Learning Algorithms for detection of Thyroid Disease

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Abstract. Thyroid disease is a widely seen disease, especially in the female gender and mostly this disease is common in one of our neighboring country Bangladesh. The problem is usually most people aren't aware of it and neglect the symptoms of the disease which leads to the disease being in its critical stage. There are many types of thyroids available but this research paper focuses on Hypothyroidism wherein thyroid hormone is not produced enough by the thyroid gland. Machine learning and classification algorithms play a vital role to help doctors ease the detection of the thyroid. But to give accurate results we need to perform data cleaning and transformations. In this paper, we have used the concept of feature selection i.e., we have used chi-square test feature selection and RFE Feature Selection and 4 classification algorithms to identify hypothyroidism which are the KNN algorithm, Naïve Bayes Classifier, and Random Forest Classification algorithm and Support Vector Machine (SVM). There are three main attributes from which a decision can be taken, those are Thyroxine (T4), Triiodothyronine (T3), and Thyroid-stimulating hormone (TSH).

Keywords: Thyroid Disease, Data Mining, Chi-Square Test, RFE, Feature Selection, KNN, Naïve Bayes, Random Forest, Classification..

Crop Yield Prediction and Price Prediction Using Machine Learning*

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Abstract. Civilization began with agriculture. India is an agrarian nation whose economy is heavily reliant on crop productivity. As a result, agriculture is the foundation of all business in India. In terms of farm production, India now ranks second in the world. Climate, topographical, chronological, spatial, biotechnological, diplomatic, organizational, and socio-demographic factors impact Indian agriculture. Machine learning is a new area of study in growth and yield analysis. In agriculture, crop productivity is a critical issue. Every producer would like to know how much yield he can expect. The prediction of yield is a major issue that has yet to be resolved according to the available information. For this purpose, machine learning techniques are the preferred idea. Different artificial intelligence techniques are used and evaluated in agriculture, numerous machine learning techniques are used and evaluated to forecast crop production for the following year. Our article suggests and needs to implement a method for estimating crop production based on historical data. The study's objective is to find the best crop forecast model and price prediction that can help farmers determine what crop to grow based on weather and soil nutrients. This paper compares well-known algorithms such as Decision Trees, Logistic Regression, Random Forest, K-Nearest Neighbor, Support Vector Machine, and Gradient Boosting Classifier. Random Forest expresses the highest precision of 99.29% among all classifiers.

Keywords: Machine Learning, Supervised Learning, Precise Agriculture Soil Nutrients, Crop Yield.

Chrominance based Skin Color Identification and Segmentation using YCbCr Color Model and a Simple Threshold Approach

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Abstract. The skin tone in human is significantly varying from one extend (darkest) to other (lightest) due to the difference in the amount of pigmentation (melanin). The variation in the pigmentation is the consequence of the exposure to the amount of solar radiation and heredity. Even though skin color detection and segmentation is the challenging and complex task which finds applications in face recognition, human tracking, video conferencing, content based image retrieval. The proposed segmentation procedure is provocative due to the attributes like illumination, the characteristics of the image capturing device, ethnicity and individual characteristics. The segmentation is the clustering process wherein the whole image is clustered into small groups according to the color or texture characteristics. The attainment of image analysis is exclusively based on the upshot of the segmentation. In skin color segmentation, pixels clustered as the skinny or non-skin pixels. The proposed method utilized YCbCr color model as a tool for the skin tone detection and segmentation. The outcome of the proposed system is weighed against with RGB color model. Experimental results clearly illustrated that the proposed method has a very good efficiency to segment skin color pixels.

Keywords: Segmentation, Skin Color, Threshold, YCbCr, Color Space.

Vision-based Walls and Staircase Detection with Directional Feedback for Blinds

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Abstract. Walls and Staircase serve as useful environmental landmarks for navigation in mobility aids in or outside their surroundings for partially and non-sighted blind people. This paper includes a computer vision-based detection method that is used for detecting walls and stairs along with the measurement of step height. The images provided by the monocular camera are used to extract information about the segments that belong to the stairs and walls. When close enough, the staircase and walls are detected by a monocular camera, and the view is partitioned into two halves vertically. The detected staircase or walls provide a haptic vibration and buzzing sound feedback in the direction they are situated. The left/right collision alerts are detected through the partitioned view and dataset collected for each staircase and wall. The complete technology uses fewer sensors and provides a more efficient manner of navigating the blinds from collision alerts. This works best with the walking cane used by blinds as it also helps them to detect potholes, steps, and bumps. The system in this paper provides effective results in detecting staircases and walls by providing audio, bidirectional vibration, and beep sound. The paper aims to put forth a low-cost and efficient approach to help blinds with their daily problems.

Keywords: Walls, Staircase, Canny, Probabilistic Hough transform, Histogram.

A Cost-Benefit Investigation of Capacitor Placement Problem Using GWO Algorithm

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Abstract. The Power distribution system (DS) is the further most significant link between power utility & the consumers. The capacitors are connected in distribution system for compensation of reactive power, voltage profile enhancement and power losses minimization. As a result, optimal capacitor installation technology plays a key role in diminishing the total annual cost of power distribution systems. Thus, capacitor's allocation is of paramount importance in recent power distribution systems. The aim of this work is to determine the optimal position and kVAr rating of capacitor banks to curtail the total yearly cost and thus minimizing power losses though keeping bus voltages in prescribed limits. This research work adopts the Grey Wolf Optimizer (GWO) Algorithm to discover best location and kVAR rating of capacitors in radial DS. To check the efficiency of the approach, standard test 69 bus IEEE systems is considered here. Also, the acquired results with the proposed methodology are compared with other latest techniques. In this way, acquired results from GWO algorithm are compared with other techniques for emphasizing the benefits of the projected algorithm in order to reduce total cost as well as capitalize on the net saving.

Keywords: Capacitor Allocation, Distribution System (DS), Grey Wolf Optimizer (GWO).

Comparative Study of Embeddings with Deep Learning Models on Question Answering System

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Abstract. The rising popularity of automatic question answering systems pro- vides users with an easy platform for asking any questions from experts or ex- perienced people. Due to variations in terminologies of question and answer, errors originated in picking the correct answer. To address this challenge, various models emerge for effective text representation in form of vectors. Recent pro- gress in word embedding, led to satisfactory results in both open and close do- main QA system. This paper made a comparative analysis of vector representa- tion of questions from raw to refined level for question answering system via question similarity mechanism. The effect of tf-idf, phrase and word embeddings generated through CBOW, skip-gram, fasttext and glove models is inves- tigated. Our experimental results demonstrate that phrase embeddings are hold- ing more semantic association between features in comparison of tf-idf and word2vec with help of deep neural networks. In addition, fasttext model justi- fies its integrity in presence of other state-of arts on the SQuAD2.0 and Natural Questions datasets.

Keywords: Deep Neural Network, Fasttext, Glove, Phrase Embedding, Word embedding, Question Answering System.

Digital Solutions Enabling Sustainability and Circular Economy

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Abstract. Herein, we provide an overview of how digital solutions such as the Internet of Things (IoT), big data, and artificial intelligence (AI) may be utilized to promote sustainability and support the circular economy. The circular economy seeks to keep resources in use for as long as possible, extracting the maximum amount of value before recovering and recreating them. Until recently, no appropriate principles have been found to address the issues of supporting sustainability using digital technology. Principles are vital for enhancing sustainability in digital technologies because they give guidance for decision-making, accountability, transparency, creativity, cooperation, compliance, and long-term thinking. We discuss the opportunities of different digital solutions and propose five principles to be applied in various sectors, including manufacturing, supply chain, retail, and construction to optimize production processes, improve resource efficiency, track carbon footprints and products throughout their lifecycle. By providing transparency and traceability of materials and products, digital solutions can enable more efficient recycling and remanufacturing. Additionally, by monitoring the performance and health of buildings, IoT and Building Information Modelling (BIM) can enable more efficient maintenance and retrofitting. Overall, digital solutions play a vital role in supporting the transition to a circular economy and achieving sustainability. Digital solutions can increase sustainability by optimizing production processes, improving resource efficiency, monitoring the performance and health of energy systems and buildings, and facilitating collaboration and information-sharing among different stakeholders.

Keywords: Block chain, Neural networks, Sustainability, Telemedicine, Drones, Cloud computing.

Forecasting wheat yield using Sequential and Deep Convolutional Neural Network

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Abstract. Estimating yield and monitoring agricultural practices are crucial for ensuring local and global food security. Almost every region or country is somehow facing loss of yield due to change in climate and other conditions, it is essential to recognize the yearly variability in agricultural production and its link to meteorological conditions. If it will be possible to forecast the accurate yield on time, it will surely help in the food maintenance as well as in the development of the country in the field of agriculture. Numerous factors are responsible for the crop of growth like quality of soil, temperature affect, pesticides used, rainfall measures and how the implantation works and manages on the agricultural land. In this study, we are using metrological parameters for prediction of yield with its accuracy. Various machine learning and deep learning models are used as the forecasting models. We here are using various types of Convolution Neural Networks (CNN) for prediction of wheat yield. In this paper, we are working on the specific reason of Uttar Pradesh considering East and West Uttar Pradesh and then generalizing the result for wheat yield prediction. The result obtained from the analysis showed that the Deep Convolutional Neural Network is more accurate than sequential neural network by comparing mean absolute error and the value of R^2.

Keywords: Convolutional Neural Network (CNN), Artificial Neural Network (ANN), Recurrent Neural Network (RNN), Deep Convolutional Neural Network (DCNN), Sequential Neural Network (SNN), Mean Absolute Error (MAE), R^2.

A Novel Approach of Ontology Based Cyber Attack Detection and Prevention System Using AI

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Abstract. As the number of devices communicating information over the Internet increases daily, the need for protection is becoming a significant threat to civilization. Today's information-based society makes an ever-increasing and significant focus on digital security. There are a substantially wider range of threats and attack patterns due to the introduction of digital transformation in our lives. The advancement of technology creates security issues due to experts in cyber security's knowledge of the most recent developments. Experts need a lot of help to prevent cyber attacks and security breaches because the connection between organizations leads to "breaches in security", and "increase in security attack vectors", "heavy traffic" all of which are difficult tasks for humans to control. The availability of an automated and efficient method for detecting cyber threats is one of the most significant challenges in cyber security. Due to the threats that are developing in this post-COVID world, a number of forms of Artificial Intelligence (AI) are used at the forefront of triggering innovations in digital security. This analysis describes a novel approach of ontology-based cyber attack detection and prevention using AI. Multiclass Convolutional Neural Network (CNN) is used to detect the threats. This approach will detects and prevents the cyber attacks and protect the system.

Keywords: Cyber-security, Cyber Attacks, Threats, Artificial Intelligence, Convolutional Neural Network (CNN).

Hybrid Approach to Detect Heart Disease Symptoms Using Artificial Neural Network (ANN)

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Abstract. Every day, the health care sector produces a deluge of information. Not many efficient methods exist to mine these databases for insights that can be used in clinical disease detection or other contexts. To determine which strategy will ultimately prove most successful, this paper proposes a new way. Predictions of cardiovascular disease and other medical issues are made using a variety of data-removal techniques, each selected through a process of comparative learning. This study includes a hybrid approach to detecting the Heart Syndrome based on an artificial neural network that employs a variety of different algorithms linked to data removal that have helped in improving performance in the medical field. The first method is to apply a standard artificial neural network (ANN) to the dataset, which consists of a complex hierarchy of interconnected layers. Because of this, the employment of neural networks becomes possible. In this case, we use a high-quality neural network with a hidden layer of auto encoder to determine accuracy. It is necessary to calculate the results for both the no-auto encoder and auto-encoder scenarios and compare them. When compared to alternative approaches and published literature, performance is significantly stronger here. The optimal solution is found by using the hybrid method's estimated results.

Keywords: Machine Learning, Data mining, Auto encoder, Artificial Neural Network.

Facial Emotional Recognition Using Static Images of a Crowdy Scenario

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Abstract. In this vast changing world, to identify and recognize the facial emotions of people is the major factor of concern about their sentiments and feelings for their safety, stability, security and well-being. In this paper, our aim is to enhance the functionality of classification of the facial images in different categories based on eight different emotions- Happy, Sad, Fear, Angry, Surprise, Disgust, Contempt and Neutral by exploiting different features of input images using Python programming techniques. The proposed work can be useful for those areas which are involved in security and management. Moreover, Facial Emotional Recognition is an emergent technology being adopted in a wide range of application area. Application of Facial Emotional Recognition enhances the social interaction, social and emotional intelligence. Efficient security mechanism is required to resolve issues and errors.

Keyword: Facial Emotion, Recognition, Feature Extraction, Crowd.

Classification of News Articles in Tamil and Automatic Tag Suggestion using NLP

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Abstract. There is a large number of news articles present across various news websites in the modern world. While some of the news articles can be easily found, most of the time it is difficult to search for the required news article on the internet. It can be overcome with the help of useful search techniques where the news articles are found with the help of tags associated with them. With the goal of classifying news articles based on their titles, assigning them to predetermined categories, and suggesting appropriate tags for each, the proposed work plans to build a machine learning model. For a large number of Tamil news articles available across various news websites, very little classification work has been done on them so far. This motivated us to develop a Classification model, especially for Tamil news articles. Multinomial Naive-Bayes and Support Vector Machine (SVM) classifiers are utilized with Count Vector and TF-IDF Vector as elements to foresee the news article classification. SVM model assisted with accomplishing a decent accuracy of 81.45% with Count Vectors as elements and it brought about a high exactness of 90.87% on utilizing highlights of the new arrangement included in Term Frequency (TF) and Inverse Document Frequency (IDF) Vectors. Then again, Naive Bayes came about in 77.34% of exactness on involving it with Count Vectors as highlights and 83.86% of accuracy on involving it with TF-IDF vectors as elements.

Keywords: Multinomial Naive Bayes, Support Vector Machine, Count Vector, Term Frequency, Inverse Document Frequency (IDF).

Multicollinearity Detection for Variable Reduction in Multiple Linear Regression

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Abstract. In this work, the detection of multicollinearity is discussed to reduce the number of variables. Multicollinearity refers to the correlation between the independent attributes which causes the increase of standard error in the predictive modeling. Multicollinearity causes significant attributes to be statistically insignificant. The variation inflation factor (VIF) method is analyzed in the paper to identify the most relevant variable for developing a predictive model using multiple linear regression. After the reduction of variables, the evaluated accuracy is found to be 89%.

Keywords: Multiple Linear Regression, Variation Inflation Factor, Standard Mean Squared Error.

A Delayed Median Q-value approach to the Multi-Agent Parallel-Critic Network Architecture for Cooperative-Competitive Reinforcement Learning

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Abstract. In the very recent years, perhaps in the last couple of decades, Multi-Agent Reinforcement Learning (MARL) has been under the spotlight courtesy its extensive use in application autonomous vehicles, swarm of unmanned aerial vehicle, traffic control management, image processing and other multi-agent systems. Along with the rise of its use in different application domains, there has also been significant improvement in MARL methods and architecture. A novel parallel critic network architecture was proposed in which, each agent, has more than one critic and target critic networks. This architecture improved on the vanilla MultiAgent Deep Deterministic Policy Gradient (MADDPG) algorithm. This architecture not only gave better overall returns but also alleviated the stability of the method. In this paper, we approach the updates of the critic networks of an agent by making use of the median of the Q-values that are estimated by the critic networks along with the delayed policy and target networks update. We test this variation on the Multi-Agent Particle Environment (MPE) and we find out that the proposed variation outperforms the original method.

Keywords: Reinforcement Learning· Multi-agent Reinforcement Learning· MADDPG· Parallel Critic· median Q-value.

A New Bag-of-features Method using Roulette Wheel Whale Optimization for Histopathological Image Categorization

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Abstract. The automation of histopathological image categorization is a crucial research area for medical practitioners and pathologists. One of the widely used techniques for automated image categorization is the bag-of-features (BOF) approach. Nevertheless, constructing a codebook for this approach presents significant challenges due to the intricate backgrounds and morphological variations in histopathological images, leading to the generation of large feature vectors. To overcome this difficulty, the present study employs a roulette wheel whale optimization algorithm to efficiently identify optimal visual words for constructing the codebook. The modified BOF method is evaluated on ICIAR grand challenge and breast cancer image datasets. The experimental findings demonstrate that the proposed approach surpasses other classification techniques that were considered.

Keywords: Bag-of-features, Roulette wheel whale optimization algorithm, Histology images, Image classification.

Crime Prediction on Open Data in India using Data Mining Techniques

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Abstract. The growth in crime collection of data requires a deeper theoretical understanding to support practical crime prevention strategies that are appropriate for certain locations and times. Models are investigated for forecasting the frequency of various sorts of crimes under an administrative structure of regions utilised by the Indian police, as well as the frequency of anti-social behaviour offences, in this study. Four algorithms from several techniques are used. The information comes from the Indian police and includes over 200,000 records before pre-processing. Based on predictive performance and processing time, the results show that Support Vector Machine (SVM) may be used to forecast crime frequency. Second, to anticipate crime, an ensemble of data mining classification approaches is used. Finally, present the optimal forecasting technique for achieving the most stable results. Results study yielded a model that uses implicit and explicit data mining approaches to produce credible crime predictions.

Keywords: Crime prediction; open data; data mining; Decision Tree (DT); regression; classification.

Tire wear-out detection with features from BRIEF plus FAST and Decision Tree Classifier

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Abstract. Tire wear out detection is an important research domain for driver safety implications. We need to make sure high classification accuracy against practical constraints like varying light intensities, low quality images, view angle variations etc. is essential. The solution proposed in this paper takes these complicated backgrounds into consideration and extracts features from the regions of the tire to train detection models using FAST key-point detector and features extracted from BRIEF. After detection of these elements, images were post processed to train our classification model to detect the wear out of tires. The optimized feature vector was trained using K-means. The potency of the proposed method was verified by running optimized feature vector through five different classifiers namely decision tree, SVM, random forest, KNN and GNB. Decision tree gave the most accurate results with accuracy of 90.41%.

Keywords: Tire wear out detection, FAST, BRIEF, K-Means, PCA, Decision Tree, SVM

A Scientific Survey on Weather Forecasting Techniques and its Classification

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Abstract. One of the most important aspects of our lives is the weather, which is often referred to as the uncontrollable one, despite the fact that climate more frequently determines where people live, what they wear, and even what they eat. It is composed of variables such as wind, deceitfulness, precipitation, downpour, day off, cloud, weight, and stickiness. In this paper, a brief survey has been done on weather and forecasting methods, classification and general methods of weather forecasting along with their advantages, limitations and shortcomings which may be helpful for the learners and researcher's community. It helps in the description, summary, evaluation, substantiation, and clarification of the literature and provides a theoretical foundation for the research and helps in determining the study's scope. This review is a collection of various research papers that summarizes the knowledge in the present scenario along with applicable findings and theoretical and methodological contributions in the field of weather forecasting.

Keywords: Meteorology, Weather, Forecasting, Machine Learning, NWP, ANN, Time-series.

Computational Blockchain Techniques in Healthcare 4.0: A Systematic Review

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Abstract. Healthcare 4.0 is an expression developed recently and derived from Industry 4.0. Current medical services are more advanced than many years ago with X-beams and attractive reverberation imaging providing electronic diagnostic information as approaches to registered tomography and ultrasound investigations. Recently, many researchers have adopted Blockchain to improve the healthcare services of healthcare 4.0. Blockchain has great potential in healthcare various domains such as the medical services sector, because of its ability to maintain privacy, security as well as the utilizing the benefits of decentralization. In this paper presents the systematic review of blockchain-based electronic health records (HER) for healthcare 4.0. To achieve this, the research focused on articles related to the keywords such as Blockchain, Healthcare 4.0, Health Management, and Health sector are selected from four major databases, namely PsycINFO, PubMed, Scopus, and Web of Science. In total 85 articles are selected and reviewed. The role Artificial intelligence (AI) in healthcare 4.0 industry is discussed. Various security challenges of healthcare 4.0 are presented. Various shortcomings with the existing Blockchain-based Healthcare 4.0 models are also presented. Finally, various future directions are presented to facilitate future research for Blockchain-based Healthcare 4.0.

Keywords: Blockchain, Healthcare Industry 4.0, Artificial Intelligence, Health Records, Distributed Ledger.

Abnormality Detection in Heart Sound Using 1D-CNN and TQWT Transformation

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Abstract. This study's main objective is to classify heart sound signals, and its main goal is to look into the various time-frequency analysis methods that are currently accessible. In order to accomplish this goal, the signal has been transformed by using the Discrete Wavelet Transform (DWT), the Tunable Quality Wavelet Transform (TQWT), and the Empirical Mode Decomposition procedures. The modified signal that was acquired is then put into a model of a 1-D convolution neural network (CNN), where it is used to categorise the data into five different categories, including aortic stenosis, mitral stenosis, and mitral valve prolapse. The findings that were achieved by employing the three different transformation strategies and the 1-D CNN model reveal that the strategy gave the best result, with an accuracy rating of 98.36 percent, when classifying the signals. Because of this, this body of work conducted an in-depth investigation of the 1-D CNN and time-frequency analysis methods, and the researchers concluded that the suggested method yields superior results. This kind of research, which focuses on the signal of heart sound, is being brought out for the very first time.

Keywords: Heart Signal, Abnormality, TQWT, 1-D CNN, Aortic.

Efficient Way of Predicting Price in Crypto Currency by using Neural Network

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Abstract. An individual form of finance on the stock exchange is cryptocurrency. Risk factors of all kinds have an impact on the stock market. And despite the fact that it has been continuously rising over the past few years, the value of cryptocurrencies has regularly fallen unexpectedly and not as a result of the experienced effect that has supported them on the stock market. Because of its vacillations, there's a need for mechanization to forecast bitcoin on the stock exchange. This study investigates how to design a model prediction for bitcoin stock exchange forecasting utilizing LSTM. LSTM (Long Short-Term Memory) is another type of peace deals with RNN that was later developed and promoted by many analysts. Like RNN, the LSTM still resides of modules with repeating constancy. The method that we request in this research, too, is a method and form to forecast the stock exchange. Savage Finance can forecast the result in USD for the next few days. After that, the form ends and explains everything in the future.

Keywords: Stock exchange, Cryptocurrency, Stock Market, LSTM, RNN, Prediction, Bitcoin stock exchange, forecast, Neural Network, Stock Price, USD.