INTERNATIONAL CONFERENCE
ON
SECURING NEXT-GENERATION SYSTEMS USING FUTURE ARTIFICIAL INTELLIGENCE TECHNOLOGIES
(SNSFAIT-2024)
23-24 August 2024

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING,

MAHARAJA AGRASEN INSTITUTE OF TECHNOLOGY, DELHI

International Conference
on
Securing Next-Generation Systems
using
Future Artificial Intelligence Technologies
SNSFAIT – 2024
23-24 August 2024
Organized By
Department of Computer Science & Engineering,
Maharaja Agrasen Institute of Technology, Delhi, India
in collaboration with DRDO, Delhi

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Preface

We hereby are delighted to announce that Maharaja Agrasen Institute of Technology, Delhi, India in association with DRDO Delhi has hosted the eagerly awaited and much coveted International Conference on Securing Next-Generation Systems using Future Artificial Intelligence Technologies (SNSFAIT-204) in Hybrid Mode. The conference was able to attract a diverse range of engineering practitioners, academicians, scholars, and industry delegates, with the reception of abstracts including more than 800 authors from different parts of the world. The committee of professionals dedicated towards the conference is striving to achieve a high-quality technical program with track on securing next-generation systems. Therefore, a lot of research is happening in the above-mentioned track and its related sub-areas. More than 230 full-length papers have been received, among which the contributions are focused on theoretical, computer simulation-based research, and laboratory-scale experiments. Amongst these manuscripts, 12 papers have been included in the CEUR workshop proceedings (Scopus indexed) and 6 papers have been published in special section at Intelligent Decision Technologies Journal (Scopus and ESCI indexed) after a thorough two-stage review and editing process. All the manuscripts submitted to the SNSFAIT-2024 were peer-reviewed by at least two independent reviewers, who were provided with a detailed review proforma. The comments from the reviewers were communicated to the authors, who incorporated the suggestions in their revised manuscripts. The recommendations from two reviewers were taken into consideration while selecting a manuscript for inclusion in the proceedings. The exhaustiveness of the review process is evident, given the large number of articles received addressing a wide range of research areas. The stringent review process ensured that each published manuscript met the rigorous academic and scientific standards.

All the contributing authors owe thanks to the organizers of SNSFAIT-2024 for their interest and exceptional articles. We would also like to thank the authors of the papers for adhering to the time schedule and for incorporating the review comments. We wish to extend my heartfelt acknowledgment to the authors, peer-reviewers, committee members, and production staff whose diligent work put shape to the SNSFAIT-2024 proceedings. We especially want to thank our dedicated team of peer reviewers who volunteered for the arduous and tedious step of quality checking and critique on the submitted manuscripts. The management, faculties, administrative and support staff of the college has always been extending their services whenever needed, for which we remain thankful to them.

Deepak Gupta, Namita Gupta
Organizers, SNSFAIT-2024

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Dr. Nand Kishore Garg
Chief Patron

Message

I am pleased to learn that the Department of Computer Science and Engineering at Maharaja Agrasen Institute of Technology, Delhi, India, in collaboration with DRDO, Delhi, is organizing the "International Conference on Securing Next-Generation Systems using Future Artificial Intelligence Technologies" (SNSFAIT-2024) on 23rd August 2024.

I am confident that the conference will attract enthusiastic participation from experts and researchers across the globe, fostering a productive partnership with the Institute to explore and leverage emerging opportunities in the field. This event is poised to be a significant milestone in advancing next-generation AI technologies. My best wishes for the successful organization of this landmark conference.

I also extend my congratulations to Prof. Namita Gupta and her dedicated organizing team for their efforts in bringing out the souvenir on this occasion.

I wish them continued success in their endeavours.

21.08.2024

Dr. Nand Kishore Garg

Founder Chairman, MATES & Chancellor, MAU

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Prof. (Dr.) Neelam Sharma
Patron

MESSAGE

Good Wishes to all,

I am extremely pleased to learn that the Department of Computer Science and Engineering at Maharaja Agrasen Institute of Technology, Delhi, India, is organizing the "International Conference on Securing Next-Generation Systems using Future Artificial Intelligence Technologies" (SNSFAIT-2024) on 23rd August 2024.

The convergence of educationists, researchers, industry experts, students, and technocrats from various institutes and organizations on our campus will undoubtedly generate the right synergy and momentum for advancing knowledge and innovation.

I wish to express my sincere appreciation to the authors, presenters, reviewers, and committee members for their dedication, passion, and unwavering commitment to organizing an academic event of the highest quality. I commend the entire team for their outstanding efforts. I extend my congratulations to all the authors who have submitted papers and to all the attendees. I am confident that the deliberations and exchange of ideas during this conference will inspire everyone to achieve excellence in the times to come.

I applaud Prof. (Dr.) Namita Gupta and her organizing team for their exceptional work in bringing SNSFAIT-2024 to fruition. I wish them continued success.

Prof. (Dr.) Neelam Sharma
Director, MAIT

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Prof. (Dr.) S.S. Deswal
Patron

MESSAGE

It is immensely satisfying to know that the Department of Computer Science and Engineering at Maharaja Agrasen Institute of Technology, Delhi, in collaboration with DRDO, Delhi, is organizing the "International Conference on Securing Next-Generation Systems using Future Artificial Intelligence Technologies" (SNSFAIT-2024) on 23-24 August 2024.

Organizing such a significant event at this time strongly aligns with our objective of fostering an environment that encourages the exchange of ideas and advances in technological development.

I extend my heartfelt appreciation to Prof. (Dr.) Namita Gupta and her organizing team for their dedicated efforts in making SNSFAIT-2024 a resounding success.

Prof. (Dr.) S.S. Deswal
Dean, MAIT

Prof. Dr. S. S. Deswal
Dean MAIT
Maharaja Agarsen Institute of Technology
Maharaja Agarsen Chowk, Sector-22,
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Ref. No................................ *Date*...............................

Prof. (Dr.) Namita Gupta
General Chair

MESSAGE

The members of the organizing committee and I are immensely proud to present the "International Conference" under the theme "Securing Next-Generation Systems using Future Artificial Intelligence Technologies," and we warmly welcome all participants to Maharaja Agrasen Institute of Technology, Delhi, on 23rd August 2024. The conference is organized by the Department of Computer Science and Engineering, MAIT, in collaboration with DRDO, Delhi.

This conference aims to foster a deeper understanding of the latest advancements in computing and communication technologies that have driven the development of networked systems, with a strong emphasis on IoT and Edge technologies. However, the security and privacy of next-generation smart healthcare systems remain significant challenges for the widespread adoption of connected healthcare solutions. Emerging technologies such as Blockchain and Machine Learning (ML) are at the forefront of developing system security solutions that will facilitate effective adoption. Our goal is to harness blockchain technology for communication, data security, and trust management within the context of an intelligent city IoT framework.

We are delighted to host distinguished experts from academia and industry as keynote speakers and for invited expert talks. These sessions, along with the presentations of selected papers, promise to be a valuable experience for the academic and research communities.

The hard work and dedication of all the members of the various organizing committees in preparing for this conference are deeply appreciated. Without their efforts, this event would not have been possible. We extend our heartfelt thanks and acknowledgment to the Management of Maharaja Agrasen Technical Education Society for providing us with the opportunity to organize this conference. Special gratitude goes to Dr. Nand Kishore Garg Sir, Shri Vineet Kumar Gupta, Prof. Neelam Sharma Ma'am, Prof. S S Deswal Sir, all Department Heads, and the faculties, staff, and students of the CSE Department for their unwavering support, which has been instrumental in making this event a success.

On behalf of the organizing committee, I would like to express our sincere thanks to DRDO for sponsoring the conference and serving as our Financial Partner.

My deepest respect and appreciation go out to all of you.

Prof. (Dr.) Namita Gupta
HoD, CSE, MAIT

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Conference Schedule

	Time	Program
Day 1 (23-8-2024)	10:30 am	**Registration & Networking High Tea** *Venue: Basement, Block – 1*
	11:00 am	**Inauguration** **11:00am - 11:05am:** Introduction of SNSFAIT - 2024 **11:05am - 11:10am:** Prof. Namita Gupta, General Chair, SNSFAIT – 2024 **11:10am - 11:15am:** Prof. Neelam Sharma, Director MAIT, Patron, SNSFAIT – 2024 **11:15am - 11:20am:** Prof. J.V. Desai, Director General MAIT **11:20am - 11:25am:** Prof. George A. Tsihrintzis, Conference Chair, SNSFAIT – 2024 **11:25am - 11:35am:** Dr. Narendra Kumar Arya, Director (ER & IPR), DRDO **11:35am - 11:45am:** Dr. Nand Kishore Garg, Chief Advisor, MATES *Venue: Mini Audi, MAIT Campus*
	11:45 am	**Keynote address Prof. Milan Tuba, Singidunum University, Vice Rector for International Relations, Serbia** *Venue: Mini Audi, MAIT Campus*
	12:10 am	**Keynote address Prof. B.K. Panigrahi, IIT Delhi** *Venue: Mini Audi, MAIT Campus*
	12:40 pm	**Keynote address Prof. Vivek Bohara, IIIT-Delhi** **Chair, IEEE ComSoc Delhi Chapter** *Venue: Mini Audi, MAIT Campus*
	1:10 pm	**Vote of Thanks by** Prof. S.S. Deswal, Dean (Academics), Patron, SNSFAIT - 2024 *Venue: Mini Audi, MAIT Campus*
	1:20 pm	**Networking Lunch** *Venue: Basement, Block – 1*

	Time	Program
Day 2 (24-8-2024)	11:00 am	**Session – 01: Securing Next-Generation Systems using Future AI Technologies (ONLINE)** **Session Chair(s):** Dr. Moolchand Sharma, CSE, MAIT, Delhi Dr. Ankita Gupta, CSE, MAIT, Delhi **Session Co-Chair(s):** Ms. Kavita Saxena, CSE, MAIT, Delhi Ms. Deepti Gupta, CSE, MAIT, Delhi **Session – 02: Securing Next-Generation Systems using Future AI Technologies (ONLINE)** **Session Chair(s):** Dr. Sudha Narang, CSE, MAIT, Delhi Dr. Sandeep Tayal, CSE, MAIT, Delhi **Session Co-Chair(s):** Ms. Garima Gupta, CSE, MAIT, Delhi Ms. Sakshi Jha, CSE, MAIT, Delhi *Venue: ONLINE*

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Profiles

Chief Patron(s)

Dr. N.K. Garg, Founder Chairman, Maharaja Agrasen Technical Education Society and Chancellor, Maharaja Agrasen University. Dr. N.K. Garg is a notable social worker and has many noble deeds attached to his name was MLA of Delhi from Trinagar constituency. He is a National Executive of Bhartiya Janta Party. He held prominent positions in renowned organizations.

Shri. Vineet Kumar Gupta, Chairman, Maharaja Agrasen Technical Education Society. He is a renowned businessman and industrialist. Being a businessman par excellence, his faith in engaging with the latest technical know-how from around the world has led to the success of all his industrial setups. Apart from being a renowned businessman and industrialist, philanthropy is very close to his heart, and he has devoted his life in trying to make the lives of the less fortunate better in all possible ways.

Patron(s)

Prof. (Dr.) Neelam Sharma, Director, MAIT. Ph. D, M. Tech., B. Tech. She is awarded Ph.D. in Development of Fast VLSI RBSD Pipelined Arithmetic Logic Unit from UPTU Lucknow, 2006. Her Research Specialization is VLSI Technology, Digital Logic Design, Microprocessor & Microcontroller.

Prof. (Dr.) S S Deswal is currently working as Dean (Academic) at Maharaja Agrasen Institute of Technology. He is awarded Ph.D. from NIT, Kurukshetra with the Title, Studies on Ride through Capabilities for Adjustable Speed Drives. He is an active member of the International Association of Engineers, the International Association of Computer Science and Information Technology, Associate Member of the Institution of Engineers and IEEE.

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Honorary Chair

Prof. Manu Malek has extensive experience in teaching, practicing, and research in communications and computer networking; and has held various academic positions in USA and overseas, as well as technical management positions at Telcordia Technologies and AT&T/Lucent Bell Labs. He was a Distinguished Member of Technical Staff at Lucent Bell Labs until 2001; then joined Stevens Institute of Technology as an Industry Professor of Computer Science and Telecom Management. He retired from Stevens in 2008. Dr. Malek is the author, co-author, or editor of seven books, and the author or co-author of more than fifty published technical papers in the areas of control systems, communication networks, computer communications, and network management. He is a Life Fellow of the IEEE, was an IEEE Millennium medalist for his contributions.

General Chair(s)

Prof. Namita Gupta is the Head of Computer Science and Engineering Department (an NBA accredited) at Maharaja Agrasen Institute of Technology, GGSIP University, Delhi, India. She has more than 21 years of teaching experience and has played an active role in research and project development. She has coordinated numerous National and International events and hackathons in the campus like Aakash Project, Smart India Hackathon (2017-2020), e-yantra. She is also President of MAIT IIC (Institute Innovation Cell). She has been awarded "Best Performance Award" in 2007 and "Long service Award" in 2017 by MAIT for her remarkable contribution. Her current research includes Data Mining, Databases and Machine Learning.

Speakers

Prof. Dr. Bijaya Ketan Panigrahi has been working as a professor in the Department of Electrical Engineering since 2005 and was the founder head of Centre for Automotive Research and Tribology (CART) at the Indian Institute of Technology (IIT), New Delhi, India. He is the Indu Shrivastava & Serla Singh Chair Professor in Artificial Intelligence at IIT Delhi. Prior to joining IIT Delhi, he served as a faculty in Electrical Engineering Department, University College of Engineering, Burla, Sambalpur, Odisha, India from 1992 to 2005. His research focus is the design and develop artificial intelligence-based tools for the detection and classification of power quality events, fault diagnostics of induction motor drives, diagnostics of electric vehicle

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motors. He has investigated intelligent techniques for the design of maximum power point tracking controllers for the solar photovoltaic system. Professor Panigrahi is also actively involved in the research area of energy management in smart grid, EV charging infrastructures, impact of fast charging on the grid, EV battery technology, Battery Management Systemsetc. Heis mentor of many startups working in the area of EV charger design, Battery pack design and IoT devices for EVs. Dr Panigrahi has published more than 750 research articles in various international journals and conference proceedings. He is serving as the editorial board member / associate editor/ special issue guest editor of different international journals published by IEEE, IET, Elsevier, Springer etc. He is also associated with various international conferences in various capacities. He is a fellow of IEEE, Indian National Academy of Engineering (INAE), National Academy of Sciences (NASI), India, and Asia-Pacific Artificial Intelligence Association(AAIA).

Prof. Vivek Ashok Bohara (S'08–M'13–SM'19) received the Ph.D. degree from Nanyang Technological University, Singapore, in 2011. From 2011 to 2013, he was a Postdoctoral Researcher (Marie Curie fellowship) in ESIEE Paris, University Paris-East. In 2013, he joined IIIT-Delhi, India, where he is currently an Associate Professor and Head, Department of Electronics and Communication. He is also a founding faculty member of Centre of excellence in Li-Fi as well as Wirocomm Research Group in IIIT-Delhi. He has authored and co-authored over 50 publications in major IEEE/IET journals and refereed international conferences, two book chapters, and two patents. His research interests are towards Visible Light Communication (VLC), hybrid RF-VLC communication, integration of optical communication with intelligent reflective surfaces (IRS) , UAV and vehicular communication. Prof. Bohara received First Prize in National Instruments ASEAN Virtual Instrumentation Applications Contest in 2007 and 2010. He was also the recipient of the Best Poster Award at the IEEE ANTS 2014 and the IEEE Comsnets 2015 and 2016 conferences.

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Intelligent Surveillance Framework for Crowd Detection and Alerting

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[4]*Dept of Comp. Engg, FET, Jamia Millia Islamia, New Delhi, India*

Abstract

Declaring some regions to be unobstructed and crowd-free occasionally becomes a sudden necessity, and in instances like national constitutional applications and the pandemic COVID-19, monitoring a large area for the aforementioned rule and compliances becomes a major issue. Although drone surveillance technologies have been used by our security agencies recently, manual monitoring and procedures are still quite popular in nations like India. The automation that has been implemented, however, is neither intelligent nor self-alerting. There is always a path of action for security problems. Therefore, a significant democratic risk could result from a delay in the main course detection, such as when there is a crowd assembling in India or sensitive or secure regions for a while or for the reasons mentioned above. Although the governments are deploying CCTVs to monitor events, they are not yet sophisticated enough for the reasons already outlined. Even in this day and age of increasing automation, warnings must be triggered by themselves. The age we live in now is one of superior artificial intelligence systems, bringing new dynamics to society and ushering in a new era known as society 5.0. One further application of the AL & ML-based self-alerting system for secure and red alerting zones with low cost and less computationally intensive development has been put into practice and tested in this study. In order to comply with law enforcement's view of crowd gatherings, the tested system will serve as a framework for intelligent technologies that will eventually self-alert in secure and sensitive zones.

Keywords

Surveillance, Crowd Detection, Self-alerting System, Secure Zones, Artificial Intelligence (AI) and Machine Learning (ML)

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Machine Learning for Intrusion Detection System in IoT Environment with Permutation Importance

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Abstract

This study evaluates the efficacy of machine learning algorithms in enhancing intrusion detection systems (IDS) within IoT networks, focusing on logistic regression and deep neural network models. Initial findings reveal that without preprocessing, logistic regression performed poorly, underscoring the necessity of feature scaling and data balancing. Subsequent adjustments in these areas substantially improved the model's accuracy and F1-scores, demonstrating the critical importance of these preprocessing steps. Conversely, while a deep neural network achieved high accuracy, it struggled with a lower F1-score, highlighting challenges in achieving balance between precision and recall. The exploration of various preprocessing strategies, including feature importance, significantly contributed to refining the model's predictive capabilities. Future research directions include the development of advanced ensemble techniques to leverage diverse model strengths, optimization of deep learning models to better handle minority class predictions, and enhancement of real-time detection capabilities. Additionally, expanding the adaptability of these models across different IoT domains and configurations will be crucial for practical, real-world application. This study sets the groundwork for further advancements in IDS, aiming to bolster security measures across increasingly complex IoT environments.

Keywords: IoT security, machine learning, intrusion detection systems, real-time processing, federated learning, adversarial attacks

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A Secure Blockchain driven Food Supply Chain Prototype for Developing Territory in Farming Zone*

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Abstract
This paper examines the potential of blockchain technology to revolutionize agriculture and the food supply chain with a particular focus on the problems faced by farmers, especially in developing countries. The primary problem is that farmers have limited bargaining power, which allows them to price their crops unfairly by taking advantage of wholesalers. Blockchain-powered bidding mechanisms can help create a more equitable economic environment for farmers and buyers. Examining the shortcomings of current systems and the ongoing blockchain implementation in agricultural markets, this paper examines the maturity of current projects. Blockchain's decentralized and transparent nature can help increase trustworthiness and reduce fraudulent activities, ultimately leading to more equitable pricing mechanisms. Full-scale implementation has technical and financial challenges, but the paper focuses on the potential benefits, such as reducing manual interventions, streamlining transactions, and improving traceability across the supply chain. This paper highlights the promise of blockchain technology as a catalyst for reliable economic development, providing sustainable solutions to the problems faced by rural communities around the world. It also looks at the barriers and challenges that currently prevent broader adoption of blockchain among farmers and systems, including those related to education, policy, and regulatory frameworks.

Keywords
Blockchain, Traceability, Agriculture Applications, Sustainability, Decentralization.

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Next-Generation Cyberattack Detection for Industrial IoT using Extreme Learning Machine with Optimization Algorithm

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Abstract

The reliability of an industrial Internet of Things (IIoT) system is a significant end-user preference. Preserving network reliability is vital to void the loss of life. A trustworthy IIoT network incorporates the safety features of IT trustworthiness-security, safety, resilience, reliability, and privacy. Traditional security techniques and tools are not sufficient to protect the platform of IIoT owing to the variance in protocols, restricted upgrade opportunities, divergence in protocols, and earliest forms of the operating system employed in the industrial systems. With the unexpected and diversification behaviors of cyber-security attacks, classical cyber-attack recognition methods have some crucial challenges with enlarging huge data with inaccurate classification methods, unappropriated feature selection (FS) and extraction, and high computation time in prediction. This study develops an Advanced Cyberattack Detection for Industrial IoT using the Binary Salp Swarm Algorithm (ACDIIOT-BSSA) technique. The projected ACDIIOT-BSSA method mainly addresses the classification and identification of attack recognition in achieving cyber security. The first phase of data pre-processing is implemented to alter the input data into the relevant format. Next, the proposed ACDIIOT-BSSA approach achieves feature selection progress utilizing the binary salp swarm algorithm (BSSA) algorithm. For attack recognition, the ACDIIOT-BSSA method uses extreme learning machine (ELM) technique. Finally, arithmetic optimization algorithm (AOA) is deployed as a hyperparameter optimizer for the ELM method. To inspect the improved performance of the proposed ACDIIOT-BSSA approach, a wide range of experiments were done. The empirical findings reported a better outcome of the ACDIIOT-BSSA method over other existing techniques.

Keywords

Industrial Internet of Things, Cyberattack Detection, Arithmetic Optimization Algorithm, Feature Selection, Deep Learning

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Explainable Artificial Intelligence with Chicken Swarm Optimization Based Web Phishing Detection and Classification on Cyber-Physical Systems

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Abstract

At present, phishing attacks have developed as the most noticeable social network attacks controlled by government, public internet users, and businesses. Phishing websites is a cyberattack that mainly targets online user to steal their confidential data including banking details and login credentials. The websites phishing arise identical to their equal legitimate websites for appealing wide range of Internet users. The attacker cheats the user by suggesting the covered webpage as reliable or legitimate to recover its significant data. Numerous solutions for phishing websites attack had been introduced like heuristics, whitelisting or blacklisting, and Machine Learning (ML) based models. This study focuses on the design of Chicken Swarm Optimization with Explainable Artificial Intelligence using Phishing Detection and Classification (CSOXAI-PDC) techniques on Cyber-Physical Systems. The projected CSOXAI-PDC method emphasizes the effectual classification and recognition of phishing based on CPS. To attain this, the developed CSOXAI-PDC technique first executes the data normalization method. Next, the classification of phishing recognition occurs utilizing deep Q network (DQN) classifier. For enhancing the classification performance of DQN classifier, the hyperparameter tuning method can be done using the chicken swarm optimization (CSO) algorithm. Eventually, the CSOXAI-PDC method incorporates the XAI method LIME for superior clarification and perception of the black-box procedure for accurate identification of intrusions. The experimental analysis of the CSOXAI-PDC method is executed against real dataset and the outcomes establish the improvement of the projected method over existing techniques.

Keywords

Phishing Detection, Artificial Intelligence, Cyber-Physical System, Chicken Swarm Optimization, Data Normalization

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Analyzing Safety Risk Variables in Real time at Construction Sites using YOLOv8 Architecture

Danish Khan [1,†], Kumar Tejashwa [2,†], Sushruta Mishra[3,†]

Abstract

Safety in construction is a vital matter that impacts the lives and welfare of both employees and the public. Although it is a crucial part of construction safety management, hazard detection is frequently hampered by environmental constraints and human factors. In this study, we provide a novel approach that uses the most advanced deep learning model for object detection—YOLOv8 multi-class classifier—to identify and categorize hazards on construction sites. To achieve this, we gathered and created a curated list of construction sites photos with many kinds of dangers, like objects falling from height, Live Electrical Lines, Fire, and workers without proper protective equipment (PPE) kits. This Dataset of photos was analyzed by us and based on this we trained and assessed our model. We were able to detect multiple violations and risks within a single frame. This approach shows promising results in enhancing hazard identification and management, in construction safety practices.

Keywords

YOLOv8, Deep Learning, Hazards, Recall, Personal Protective Equipment, Safety Management

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Next-Generation Advanced Security systems for Communities Using Integrated IoT and Blockchain Over Cloud Computing

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Abstract

According to human requirements, various structures are being constructed and require some protection from fire accidents, floods, earthquakes, any gas leaks, and any other concerns that may arise in the neighborhood. So far, their security goal is to propose a system integrated with blockchain and an IoT system. We structure the system in different steps in our proposal to process the alarm rung by IoT devices. This IoT gadget may be used in either a private or public setting. To do this, we must process the various settings for checking and responding to the devices. Data centers that interact between sender and recipient will verify blockchain data. Finally, we provide a security solution to avoid reply assaults, transmission interruptions, and data integrity. This entire system may work together to promote community safety and eliminate avoidable disputes.

Keywords

Blockchain, Internet of Things, Cloud Computing, Community Safety, Data encryption.

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Enhancing Android Malware Detection in Internet of Vehicles using Self-Attention Transformer Model

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Abstract

The current trend for vehicles to be significantly correlated with vehicles, unspecified devices, and organization upsurges the latent for exterior attacks on vehicle's cyber-security. The main network security function is intrusion detection with open connectivity, like connected cars and self-driving. Particularly, when a vehicle is associated with an exterior device over a device in the vehicle or when it connects with an exterior structure, cybersecurity is mandatory to defend the network of software inside the vehicle. Present technique with this concern comprises intrusion detection and a vehicle gateway system. Conversely, it is challenging to block mischievous code based on behaviors of application. This study presents an Enhancing Android Malware Detection using Self-Attention Transformer Model (EAMD-SATM) model in Internet of Vehicles. The projected EAMD-SATM model categorizes and recognizes the Android malware efficiently and accurately. To attain this, the EAMD-SATM approach endures a min-max approach utilizing data pre-processing at the initial stage. Furthermore, the EAMD-SATM method employs self-attention-based transformer (SA-T) technique for the detection of Android malware. To improve the SA-T technique solution, the EAMD-SATM technique applies the improved mother optimization (IMO) technique for the parameter tuning process. The simulation validation of the EAMD-SATM algorithm can be established on a benchmark Android malware dataset. The experimental outcomes highlighted the important performance of the EAMD-SATM approach in the Android malware recognition method.

Keywords

Improved Mother Optimization, Min-Max; Android Malware, Self-Attention Transformer, Internet of Vehicles

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Revolutionizing Remote Collaboration: A Comprehensive Review of Cloud-Based Real-Time Platforms to Secure Teams

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Abstract
This comprehensive review delves into the trans- formative landscape of remote collaboration, focusing on Cloud- Based Real-Time Platforms for teams. Emphasizing the evolution and impact of these platforms, this paper explores their functionalities, including seamless communication, simultaneous document editing, and secure file sharing across remote environments. Assessing their scalability, accessibility, and integration of robust security measures, the review highlights their role in transcending geographical barriers, fostering cohesive virtual workspaces, and enhancing productivity. By scrutinizing the adoption rates and user experiences, this review outlines the significance of these platforms in revolutionizing remote team collaboration.

Keywords
Remote Collaboration, Cloud-Based Platforms, Real-Time Communication, Document Editing, File Sharing

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Performance Evaluation of Security Enabled Surgically Implantable Smart Pacemakers in Cardiac Risk Patients

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Abstract

The healthcare sector is benefiting from medical equipment' connectivity in several ways, such as enhanced patient outcomes, automatic alarms, and remote observing. After analyzing the current IoT-driven healthcare applications, creative tech-based solutions are still required to meet the difficulties in the medical setting. In this study, we examine connected pacemaker security challenges in an organized way. While methods exist for formal affirmation of pacemaker software, these are not suitable to prevent security weakness. To this end we develop a operating-time approach. We examine security threats and challenges related to automated Pacemakers and patients' privacy are mostly driven by monetary motives with analysis of several automated device safety solutions currently in place needs improvement by wearing wearable devices. Our approach proposes a wearable device that non-contact senses the familiar radiation signals in order to determine if a pacemaker has been compromised in features along with safety measures. We develop a set of timed policies to be monitored at run-time. We provide a methodology for the design of the wearable device and results illustrate the technical practicality of the developed concept.

Keywords

Remote observing, Pacemaker, Security threats, Patients' privacy, monetary motives, Wearable devices.

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Optimized Security Mechanism for publicly Secret Key Sharing over Cloud using Blockchain

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Abstract

A publicly verifiable key sharing mechanism based on threshold key sharing is provided to explore the security of users' private keys on the blockchain. Participating nodes check the key fragment after receiving it, effectively preventing it from being abused. The crucial sections of the nodes that participated in the critical splicing are made public during the critical recovery stage to prevent them from performing harmful things during the critical recovery stage. Add IDs to the nodes that participated in the crucial splicing during the key distribution stage; a dynamic threshold system is intended to track and update the status of malicious nodes in real time. When the node that possesses the crucial component fails, the owner of the critical component and the main node relocate a key element to the new participating nodes. To safeguard sensitive information. The experimental results show that this system has a key recovery rate of 80% and threshold qualities such as traceability, enforceability, and recoverability.

Keywords

Key sharing mechanism, Blockchain, Secret key, Privacy, Security, Encryption.

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Securing IoT Devices Based on Zero Trust Intrusion Detection System Using Deep Learning with Sine Cosine Algorithm

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Abstract
The rapid growth of Internet of Things (IoT) devices provides distinct challenges in preserving the privacy and security of interconnected systems. As cyber-attacks are more common, evolving a scalable and effective Intrusion Detection System (IDS) based on deep learning (DL) for IoT has become more complex. When handling evolving and dynamic cyberattacks, the present techniques are unable to balance temporal and spatial feature extraction. The lack of diversity in dataset employed for DL-based IDS evaluation also interferes with evolution. Besides, there is a significant trade-off between scalability and performance, mainly when the amount of edge devices in communication upsurges. To tackle these challenges, this research paper presents a horizontal DL method that unites Bidirectional Long-Term Short Memory (BiLSTM) and Convolutional Neural Network (CNN) for efficient intrusion detection. This article introduces a novel Sine Cosine Algorithm with Deep Learning based Zero Trust Intrusion Detection System (SCADL-ZTIDS) method for secure IoT Devices. The foremost intention of the SCADL-ZTIDS technique rests in the effectual and automated classification of zero trust IDS. In the first stage, the SCADL-ZTIDS approach endures a min-max scaler utilizing data pre-processing to convert the actual data into beneficial form. Moreover, the deep neural network (DNN) technique is employed for the identification and classification of intrusions. Furthermore, the sine cosine algorithm (SCA) is utilized for fine-tuning the parameters contained in the DNN method. To describe the heightened performance of the SCADL-ZTIDS approach, a wide range of empirical analyses are implemented on benchmark datasets, and the outcomes are examined under various features. The simulation outcomes highlighted the improved intrusion detection performance of the SCADL-ZTIDS approach over the recent DL techniques.

Keywords: Intrusion Detection System, Zero Trust, IoT Devices, Sine Cosine Algorithm, Deep Learning, Data Pre-Processing

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AN INTEGRATED TEA LEAF DISEASES IDENTIFICATION AND RETRIEVAL MODEL USING MACHINE LEARNING AND DEEP LEARNING APPROACH

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ABSTRACT
The tea plant, or Camellia sinensis, is a tiny plant cultivated for its leaves, which are used to prepare beverages. India is home to one of the most extensive tea plantations in the world. After 1920, tea became one of the most popular drinks in India. Tea is cultivated in various parts of India, such as Darjeeling, Nilgiris, Munnar, and Karnataka tea estates. India's economy depends heavily on the tea plantation business. Tea production is directly impacted by foliar diseases, which many bacteria, fungi, and other pests can bring on. The tea plant is affected by various diseases, such as root disease (capital loss), Stem disease (yield stagnation), and leaf disease (Crop loss). This initiative focuses on leaf diseases, which aims to increase output. Tea leaves are susceptible to various fungal infections, including blister blight, frog eye spot, grey blight, scab, and brown blight. The third study presents a model for classifying tea diseases using deep learning and transfer learning techniques. The model applies k-means clustering to the input to extract diseased parts, and the image generator module is utilized to generate multiple disease samples with varying orientations. The proposed transfer learning method employs Efficient Net as the deep learning model to train augmented images and accurately classify disease. Comparisons are made between the proposed method and existing deep learning techniques for tea leaf classification, and it is found that the proposed method produces more accurate results in less computational time. This study employs machine learning and deep learning strategies to tackle tea leaf disease, one of the industry's most pressing problems.

Keywords: Leaf Disease , Deep Learning , Retrieval Model .

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Comparative Performance Analysis of YOLO Object Detection Algorithms for Weed Detection in Agriculture

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Abstract. In the face of a growing global population, optimizing agricultural prac- tices is crucial. One major challenge is weed infestation, which significantly re- duces crop yields and increases production costs. This paper presents a novel system for weed-crop classification and image detection specifically designed for sesame fields. We leverage the capabilities of Convolutional Neural Networks (CNNs) by employing and comparing different modified YOLO based object de- tection models, including YOLOv8, YOLO NAS, and the recently released Gold YOLO. Our investigation utilizes two datasets: a publicly available weed image collection and a custom dataset we meticulously created containing sesame plants and various weed species commonly found in sesame fields. The custom dataset boasts a significant size of 2148 images, enriching the training process. Our find- ings reveal that the YOLOvv8 model surpasses both YOLO NAS and Gold YOLO in terms of key evaluation metrics like precision, recall and mean average preci- sions. This suggests that YOLOv8 demonstrates exceptional potential for real-time, on-field weed identification in sesame cultivation, promoting informed weed man- agement strategies and ultimately contributing to improved agricultural yield.

Keywords. Object detection, Sesame Weed, processing, Classification, Robotics weeding

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An Improved Coot Optimization Algorithm and its Application to Global Optimization Problems

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Abstract
The Coot algorithm is a novel metaheuristic algorithm inspired by the movement of a flock of Coot birds. However, the Coot algorithm has many weaknesses. Like any other metaheuristic algorithm, the Coot algorithm can simply get stuck in local optimum, exhibit unsatisfactory diversity, have sluggish convergence speediness, and struggle to maintain a satisfactory equilibrium between intensification and diversification. Thus, to address the shortcomings of the Coot algorithm, in this study four effective methods are introduced, including population directed by gbest, randomization parameter, exponential factor (EF), modifying the location and guiding the group towards the best location. The proposed modified approach is named as ICoot that can compensate the weakness of the standard Coot algorithm. The efficiency of the suggested ICoot algorithm is examined on 13 classical test functions. In addition, the statistical analysis including the Wilcoxon test and t-test are executed to verify the significance differences of ICoot corresponding to the prominent state-of-art algorithms. The experimental outcomes showed that the newly proposed ICoot algorithm produced efficient outcomes compared to other prominent algorithms.
Keywords: Meta-heuristics, Swarm Intelligence, Coot optimization algorithm

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Air Quality Index Prediction for Clearer Skies Using Improved Long Short-Term Memory

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Abstract
Air pollution has become an international calamity, a problem for human health andthe environment. The ability to predict the air quality becomes a crucial task.The usual approaches for assessing air quality are exhausted when extracting complicated non-linear relationships and long-term depen- dence features embedded in the data.Long- and short-term memory, a recur- rent neural network family, has emerged asa potenttool for addressing the mentioned issues, so computer-aided technology has become essential to aid with a high level of prediction and best-in-class accuracy. In this study, we investigated classictime-series analysis based on Improved Long short-term memory (ILSTM) to improve the performance of air quality index prediction. The predicted AQI value for the 25 days lies in a 97.63%Confidenceinter- val zone and highly adoptable performance metrics such as R-Square, MSE, RMSE, and MAE values.

Keywords: LSTM (Long Short-Term Memory), Air Quality Forecasting, Time Series Modeling, Recurrent Neural Networks, Hyperparameter Tuning

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Comparative Analysis of Life Expectancy Prediction using Regression Algorithms

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Abstract
This study performed a comparative analysis of various imputations for NULL values in the dataset, namely, mean, median, and mode. We implemented eleven regression models, including Linear and Support Vector Regression and tree-based regression models, such as decision tree, Surrogate tree, and ran- dom forest, with five different pre-processing techniques, providing different types of results. The core objective of this study is to compare these results and reach an interpretation as to why certain imputation technique produces a certain output. The interpretation of this result is helpful in the selection of the regression model. The experimental results of the proposed technique were evaluated and validated for the performance and quality analysis of life expectancy prediction using various quality parameters. Among the results, the highest accuracy was produced by random forest regression with an accuracy of 96.8%, which proves the significance of random forest in comparison to other state-of-the-art regression methods for life expectancy prediction.

Keywords: Life Expectancy, Random Forest, Decision Tree, Surrogate Tree, Support Vector Regression, Regression Methods

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Enhancement of IOTA Implementation in IoT: To improve performance parameters with resource management by IOTA using the distributed ledger technology method

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Abstract

This study aims to optimize IOTA network transaction processing through the introduction of the IOTA-DLT-based RA-WRW algorithm. Objectives include improvement of execution time, CPU usage, network efficiency, and scalability by IOTA while upholding robust security measures. The IOTA-DLT-based RA-WRW algorithm is developed in Python, considering node resources and transaction weights for optimal tip selection. Authentication using the sender's private key ensures data integrity, with verification procedures confirming tip authenticity and transaction validity. Implementation of the algorithm significantly improves IOTA network transaction processing efficiency. The experiment is carried out on a standard dataset available in Kaggle and a specific system comparing the results. Results show notable enhancements in execution time, CPU usage optimization, network efficiency, and scalability. Chosen tips exhibit high authenticity and consistency, affirming the algorithm's effectiveness. The research introduces the novel IOTA-DLT-based RA-WRW algorithm, uniquely combining Resource Allocation and Weighted Random Walk strategies. This approach enhances security, efficiency, and scalability in distributed ledger transactions, contributing to the IOTA network's transaction processing advancement.

Keywords

Transaction datasets, transaction weights, random walk, tip selection, private key.

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Automated Medical Diagnosis of Dementia Through Fine-Tuned EfficientNet

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Abstract

Automated models using deep learning are more extensively used in medical imaging in the last decade. The present study contributes to the diagnosis of dementia using MRI. Dementia is a syndrome that deteriorates the cognitive function of the brain. The disease has no cure, till now, except for the prior diagnosis. The present study aims for classifying the MRI scans of two datasets OASIS and ADNI into 2 categories: binary and multi-classification. To achieve the objective, the EfficientNetB0 architecture of deep learning is fine-tuned by adding three dense layers on the top of the network. The swish activation function is used in the inner dense layers added. The dropout and batch normalization layers are also added for dealing with the problem of overfitting. This architecture offers high accuracy and high efficiency compared to other pre-trained networks. The model is assessed on various performance measures and outperformed the state of art techniques. For the OASIS dataset, the best testing accuracy for binary classification is 93.10% with a 0.01 learning rate. The sensitivity is 95.93%, specificity is 90.08%, false-negative rate is 4.07, the false-positive rate is 9.92 and the F1-score is 93.48%. The best testing accuracy of multi-classification is 84.50% with a 0.001 learning rate. For the ADNI dataset, the best testing accuracy is 96.08% with a learning rate of 0.001. The sensitivity is 94.74%, specificity is 99.32%, false-negative rate is 5.26, the false-positive rate is 0.68 and the f1-score is 97.16%. The best testing accuracy of multi-classification is 98.10 with a 0.01 learning rate. The proposed model can be utilized for developing an automated framework to help medical services to improve decision-making.

Keywords: Dementia, Magnetic resonance imaging, Pre-trained networks, Transfer learning, EfficientNet.

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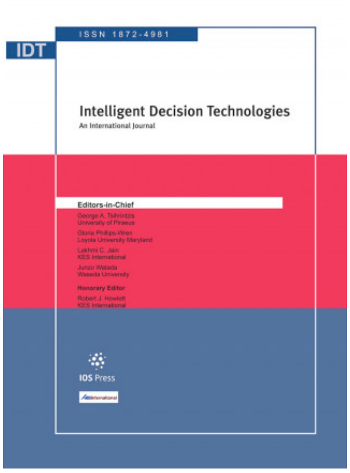

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