





AI & CYBER SECURITY CONCLAVE 2K25 Securing Future of Innovation

souvenir

AI & CYBER SECURITY CONCLAVE 2K25

securing future of innovation

22nd – 23rd, April 2025 (Hybrid Mode)

Organized by

Anand School of Engineering & Technology, SHARDA UNIVERSITY AGRA

www.agra.sharda.ac.in



Founder, Sharda Group Chancellor, Sharda University Chairman, Sharda Hospital & Sharda Care-The Health City



Co-Founder, Sharda Group Pro-Chancellor, Sharda University Vice Chairman, Sharda Hospital & Sharda Care-The Health City



Vice-Chancellor, Sharda University Agra



Dean, Anand School of Engineering & Technology, Sharda University Agra



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PREFACE

It is with immense pride and anticipation that we present this souvenir for the **AI & Cybersecurity Conclave 2K25 -** a landmark gathering that celebrates innovation, collaboration, and the relentless pursuit of knowledge in two of the most transformative domains of our time.

In an age defined by rapid digital transformation, **Artificial Intelligence and Cybersecurity** stand as twin pillars shaping the future of technology, governance, and society. As AI continues to evolve-unlocking new possibilities in automation, analytics, and decision-making-it becomes ever more essential to pair its growth with robust, adaptive security frameworks. The convergence of these fields presents not just opportunities, but also complex challenges that demand insight, dialogue, and interdisciplinary effort.

This conclave brings together an exceptional constellation of researchers, practitioners, policy-makers, educators, and students from across the globe. Through keynote sessions, technical panels, workshops, and exhibitions, we aim to foster meaningful exchange and spark ideas that will shape the next generation of secure, intelligent systems.

The souvenir you hold is more than a memento-it is a curated reflection of the spirit of this conclave. Within these pages, you will find scholarly articles, expert insights, organizational highlights, and a showcase of the innovative efforts that are pushing the boundaries of what is possible in AI and cybersecurity.

We extend our heartfelt gratitude to all contributors, sponsors, and participants whose efforts and enthusiasm have made this event possible. Your commitment to excellence and innovation is the driving force behind this successful initiative.

As we look toward a future powered by intelligent technologies and safeguarded by resilient defenses, we hope this conclave-and its commemorative souvenir-will continue to inspire learning, collaboration, and responsible innovation.

Warm regards,

Prof. (Dr.) R. Swaminathan Organizer & Dean, ASET Al & Cybersecurity Conclave 2K25

THE HON. CHANCELLOR

It gives me immense pleasure to welcome all distinguished guests, researchers, academicians, and students to the AI & Cybersecurity Conclave: 2K25, hosted at Sharda University Agra. This event stands as a testament to our commitment towards fostering innovation, collaboration, and excellence in two of the most transformative domains of our time, Artificial Intelligence and Cybersecurity.

In a world increasingly shaped by intelligent technologies and digital interconnectivity, it is imperative that we continue to explore, understand, and lead the evolution of AI and cybersecurity to ensure a secure, ethical, and sustainable future. This conclave provides a dynamic platform for thought leaders, industry experts, and budding researchers to exchange ideas, present cutting-edge research, and inspire solutions that will shape the technological landscape of tomorrow.

I commend all participants for their valuable contributions and encourage everyone to use this opportunity to engage, learn, and collaborate. May this event ignite new ideas, forge lasting partnerships, and contribute meaningfully to the advancement of knowledge and innovation.



66 Wishing the AI & Cybersecurity Conclave : 2K25 grand success.

Warm Regards,

Shri P. K. Gupta Chancellor, Sharda University Agra

THE HON. PRO-CHANCELLOR

It is with great pride and enthusiasm that I extend my heartfelt greetings to all participants, speakers, and attendees of the AI & Cybersecurity Conclave: 2K25, organized by Sharda University, Agra.

As we navigate the complexities of the digital age, the convergence of Artificial Intelligence and Cybersecurity presents both tremendous opportunities and critical challenges. This conclave serves as a vital platform for sharing pioneering research, innovative ideas, and practical solutions that can shape the future of technology and secure our increasingly digital society.

At Sharda University, we believe in nurturing a culture of inquiry, innovation, and impact. Events like this embody our vision of academic excellence and global relevance, bringing together bright minds from across the academic and industry spectrum to explore, question, and collaborate.

I congratulate all contributors whose dedication and research have made this conclave a vibrant and enriching experience. May the deliberations here inspire continued advancement and spark lasting connections across disciplines.



GG Wishing the AI & Cybersecurity Conclave : 2K25 grand success.

Warm Regards.

Shri Y. K. Gupta Pro-Chancellor, Sharda University Agra

The CEO Sharda Group & President, Sharda University Uzbekistan

It gives me immense pleasure to extend a warm welcome to all participants, researchers, academicians, industry experts, and students to the AI & Cybersecurity Conclave: 2K25.

In today's rapidly evolving digital landscape, Artificial Intelligence and Cybersecurity stand at the forefront of innovation, transforming industries, economies, and societies. This conclave is a platform to explore the latest trends, share groundbreaking research, and foster meaningful collaborations that will shape the future of intelligent and secure technologies. At Sharda University Agra, we are committed to promote a culture of academic excellence, innovation, and global cooperation. The Conclave embodies this spirit by bringing together brilliant minds from across the world to deliberate on challenges and opportunities in AI and Cybersecurity.

I encourage all participants to engage actively, exchange ideas, and contribute to the collective vision of a smarter and safer digital future.



Wishing you all a successful and enriching experience at the Conclave.

Warm Regards,

66

Mr. Prashant Gupta

Chief Executive Officer, Sharda Group President, Sharda University Uzbekistan

The Director, Sharda Group & Vice President, Sharda Hospital



It is with great pride and enthusiasm that I welcome you all to the AI & Cybersecurity Conclave: 2K25, a forward-thinking initiative aimed at addressing some of the most critical aspects of our digital era.

As technology continues to revolutionize every domain, including healthcare, education, and industry, the integration of Artificial Intelligence and Cybersecurity has become essential. From enhancing patient care in hospitals to securing critical data infrastructures, the impact of these technologies is profound and far-reaching.

This conclave serves as a dynamic platform for dialogue, innovation, and knowledge-sharing. It brings together thought leaders, researchers, professionals, and students to engage in meaningful discussions and explore transformative ideas that will define the future.

At Sharda University Agra, we strongly believe in fostering a culture of learning, collaboration, and innovation. This event is a testament to our ongoing commitment to bridge academia with industry and advancing research that matters. I encourage each participant to take full advantage of this opportunity, and I look forward to the impactful contributions and inspiring outcomes that will emerge from this gathering. With best wishes for a successful conclave,

Warm Regards.



Director, Sharda Group Vice President, Sharda Hospital

The Vice-Chancellor

It gives me immense pleasure to extend a warm welcome to all the participants, distinguished guests, researchers, and students attending the AI & Cybersecurity Conclave: 2K25, hosted by Sharda University Agra.

In an era defined by rapid technological advancements, Artificial Intelligence and Cybersecurity are emerging as critical pillars shaping our global future. This conclave is a timely initiative that brings together brilliant minds to engage in meaningful dialogue, share groundbreaking research, and explore practical solutions to some of the most pressing technological challenges of our time.

At Sharda University Agra, we are deeply committed to fostering academic excellence, interdisciplinary collaboration, and innovation-driven growth. This event reflects our endeavor to create a vibrant knowledge ecosystem that not only keeps pace with global trends but also contributes proactively to societal advancement.

I commend the organizing committee, researchers, and contributors for their dedicated efforts in making this conclave a platform of intellectual exchange and future-focused insights. I am confident that the discussions and outcomes of this event will leave a lasting impact on all who are part of it.



GG Wishing the AI & Cybersecurity Conclave : 2K25 great success and continued growth in the years to come.

With Best Wishes. **Prof. (Dr.) Jayanthi Ranjan** Vice-Chancellor, Sharda University Agra

The Registrar

It gives me immense pleasure to welcome all participants, speakers, academicians, industry experts, and students to the AI & Cyber Security Conclave 2K25 being organized by Sharda University, Agra.

In today's fast-evolving digital landscape, Artificial Intelligence and Cyber Security stand as pillars of innovation and resilience. This conclave offers a timely platform for meaningful dialogue, knowledge sharing, and collaborative exploration in these critical domains. As we navigate through the transformative potential of AI and the growing complexities of cybersecurity threats, it becomes essential to foster an ecosystem that promotes research, ethical practices, and strategic preparedness.

Sharda University has always been committed to academic excellence and innovation. Through this conclave, we aim to bring together thought leaders, researchers, practitioners, and aspiring professionals to discuss emerging trends, share valuable insights, and envision a safer, smarter future powered by technology.

I extend my heartfelt thanks to all contributors and organizing members who have worked tirelessly to make this event a success. May this conclave ignite ideas, inspire collaborations, and contribute to shaping the future of AI and cybersecurity.



GG Best wishes for a fruitful and enriching experience at the conclave

Warm Regards.

Dr. Praveen Tiwari Registrar,

Sharda University Agra

The Dean

It is with great pride and enthusiasm that I welcome all participants, researchers, academicians, and industry experts to the AI & Cybersecurity Conclave: 2K25, organized by Sharda University, Agra.

In today's fast-evolving digital landscape, the integration of Artificial Intelligence and Cybersecurity has become vital to ensuring technological progress that is both innovative and secure. This conclave is a significant initiative that provides a platform for meaningful discussions, the exchange of ideas, and the presentation of forward-thinking research that addresses current challenges and future possibilities.

As Dean, I am delighted to witness the active participation of scholars and professionals who are passionate about driving change and contributing to the advancement of knowledge. The papers presented and the interactions taking place during this conclave are a true reflection of our shared commitment to academic excellence and practical impact.

I extend my heartfelt congratulations to all contributors and express my gratitude to the organizing team for their dedication in making this event a success. May the insights gained here inspire new collaborations, discoveries, and innovations



66 Wishing the AI & Cybersecurity Conclave: 2K25 a rewarding and impactful journey.

Sincerely,

Prof. (Dr.) R. Swaminathan

Dean, Anand School of Engineering & Technology, Sharda University Agra

The Head AI & Cybersecurity

It is a matter of great honor and excitement to welcome you all to the AI & Cybersecurity Conclave: 2K25, organized by Sharda University Agra. This event marks a significant milestone in our journey to foster innovation, research, and collaboration in two of the most transformative domains of the 21st century—Artificial Intelligence and Cybersecurity.

As Head of the Department of AI & Cybersecurity, I have witnessed firsthand the rapid evolution and growing significance of these fields. Today, as we stand at the intersection of unprecedented technological advancements and emerging global challenges, the need for secure, ethical, and intelligent systems is greater than ever before.

This conclave brings together thought leaders, researchers, students, and practitioners from across the nation and beyond, to share knowledge, showcase breakthroughs, and spark new ideas. It is a celebration of academic rigor, creative thinking, and the power of collaboration.

I extend my heartfelt thanks to all participants, paper presenters, keynote speakers, and organizers for making this event a reality. May this conclave serve as a catalyst for future innovations and meaningful partnerships that help shape a smarter and more secure digital world.



Wishing the AI & Cybersecurity Conclave: 2K25 great success and continued impact.

Warm Regards.

66

Mr. Gopalji Varshneya Head, Department of Al & Cybersecurity Sharda University Agra

The Head – Department of Computer Science & Engineering

It is with great pride and enthusiasm that I extend my warmest greetings to all participants of the AI & Cybersecurity Conclave: 2K25, organized by Sharda University Agra.

The convergence of Artificial Intelligence and Cybersecurity is reshaping the digital future, opening doors to revolutionary advancements while simultaneously demanding robust and resilient systems. This conclave is a timely initiative that brings together brilliant minds from academia, industry, and research to discuss cutting-edge developments, present innovative solutions, and collaborate on ideas that have the power to transform our world.

As Head of the Department of Computer Science & Engineering, I am delighted to see our university serve as a platform for such a prestigious gathering. It reflects our commitment to excellence in education, research, and technological innovation. I am confident that the knowledge shared and relationships built during this conclave will inspire new directions in both AI and cybersecurity domains.

I would like to congratulate all paper presenters, delegates, and organizing members for their valuable contributions. May this event be a stepping stone for future research, partnerships, and impactful discoveries.



GG Wishing the AI & Cybersecurity Conclave: 2K25 great success and continued growth.

With Best Regards.

Mr. Achal Kumar

Head, Department of Computer Science & Engineering Sharda University Agra

The Head – Department of Computer Applications

It gives me immense pleasure to extend a warm welcome to all the distinguished guests, participants, and contributors to the AI & Cybersecurity Conclave: 2K25, hosted by Sharda University Agra.

In today's rapidly digitizing world, Artificial Intelligence and Cybersecurity have become two pivotal pillars driving innovation and safeguarding the integrity of our digital ecosystems. This conclave provides an excellent platform for researchers, academicians, professionals, and students to exchange ideas, present research, and explore emerging trends in these transformative fields.

As Head of the Department of Computer Applications, I am proud to witness such a vibrant gathering of intellectual minds coming together to discuss the future of intelligent and secure technologies. It is through such collaborations and shared knowledge that we can empower the next generation of thinkers and problem-solvers.

I extend my heartfelt appreciation to all participants, keynote speakers, and the organizing committee for their tireless efforts in making this event a reality. I am confident that the insights and innovations emerging from this conclave will contribute significantly to the global discourse on AI and cybersecurity.



Wishing the AI & Cybersecurity Conclave : 2K25 great success and lasting impact.

Warm Regards,

66

Mr. Amitabh Padmanabhan

Head, Department of Computer Applications Sharda University Agra

AI & Cybersecurity Conclave 2k25 Program Schedule

April 22, 2025

S. No	. Day	Timings	Name of the Event	Venue
1	Day-1	10:00 AM - 11:30 AM	Inauguration	Raman Hall
2	Day-1	11:30 AM - 12:00 PM	High Tea	BT Ground Floor
3	Day-1	12:00 PM - 12:30 PM	Stalls Visit of the companies	-
4	Day-1	12:30 PM - 1:15 PM	Project Exhibition	Architecture Building
5	Day-1	1:15 PM - 2:15 PM	Lunch	BT Ground Floor
6	Day-1	2:15 PM - 2:45 PM	Panel Discussion- AI in Indian Judiciary	Raman Hall
7	Day-1	2:45 PM - 3:30 PM	Keynote Speech-Deep dive into NVIDIA's AI Infrasturture	Raman Hall
8	Day-1	3:30 PM - 3:45 PM	Tea/Snacks	BT Ground Floor
9	Day-1	3:45 PM - 4:15 PM	Keynote Speech:Understanding Intelligence: From Traditional AI to Generative AI	Raman Hall

April 23, 2025

S. No.	Day	Timings	Name of the Event	Venue
1	Day-2	10:00 AM -10:30 AM	International Panel discussion : AI Driven Smart Agriculture Integrating IoT, Data Analytics, and Electronics for Sustainable Crop Health	Raman Hall
2	Day-2	10:30 AM -11:00 AM	Panel discussion- AI in Cybersecurity	Raman Hall
3	Day-2	11:00 AM - 11:15 AM	Tea/Snacks Break	BT Ground Floor
4	Day-2	11:15 AM - 01:15 PM	Poster Presentation / Paper Presentation	CSE Classroom/Media Centre
5	Day-2	01:15 PM - 02:15 PM	Lunch	BT Ground Floor
6	Day-2	02:15 PM - 03:15 PM	AI Quiz / AI Reel competition	Raman Hall/Media Centre
7	Day-2	03:15 PM - 04:00 PM	ASET Prastuti – Cultural	Raman Hall
8	Day-2	04:00 PM - 04:30 PM	Valedictory Function	Raman Hall

Organizing Committee

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Dr. Shahjad Ali Applied Science

Ms. Nandini Sharma

CSE

Session Chair

Dr. Shikha Singh BCA

Ms. Archana Singh

Mr. Priyadarshi

Mr. Shiwam Singh

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Ms. Archana Singh

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Accepted Research Papers (Abstract)

Global AI and Privacy Regulations Striking a Balance between Innovation and Safeguards

Manuscript Number : SUA-ASET-AICC-2K25-001

Sibaram Prasad Panda

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Abstract

Artificial Intelligence (AI) technologies maintain to transform societies globally, raising massive concerns concerning privateness, safety and facts governance. This paper examines the evolving panorama of AI privateness policies across predominant jurisdictions, figuring out regulatory gaps, implementation challenges, and rising high-quality practices. Through comparative evaluation of the European Union's General Data Protection Regulation (GDPR), California Consumer Privacy Act (CCPA), China's Personal Information Protection Law (PIPL), and other sizable frameworks, this study highlights the varying tactics to balancing innovation with person rights. The findings recommend that effective global AI privateness governance requires harmonization of regulatory requirements, privacy-by-layout ideas, algorithmic transparency, and internationally coordinated enforcement mechanisms. This paper proposes a comprehensive framework that addresses move-border statistics flows while keeping meaningful human autonomy in increasingly more AI-mediated environments.

Keywords

Artificial intelligence, data privacy, global governance, privacy regulations, regulatory harmonization, Algorithmic Transparency, privacy by design

Al-Powered Analytics : A New Era in Data Science



Sadanand Sundaray

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Abstract

The integration of synthetic intelligence (AI) into information analytics has fundamentally converted the panorama of facts technological know-how, ushering in extraordinary talents for extracting insights from complex datasets. This paper examines the evolution, present day country, and future trajectory of AI-powered analytics, with particular emphasis on latest advancements in system studying algorithms, natural language processing, pc vision, and their programs across diverse industries. We analyze how these technologies cope with conventional analytics demanding situations, introduce novel methodologies for knowledge discovery, and reshape organizational selection making strategies. Furthermore, we discuss the technical, ethical, and implementation challenges that accompany those innovations, imparting a framework for accountable adoption. Our findings imply that AI-powered analytics represents not simply an incremental development; however, a paradigmatic shift that essentially alters how businesses derive value from records, with large implications for research, practice, and policy.

Keywords

artificial intelligence, data science, machine learning, big data analytics, predictive modeling, deep learning, natural language processing, computer vision

Advanced Layered Security for User Authentication



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Abstract

User trust is a key element of cybersecurity in the current digital world. Passwords and user names are always vulnerable to bruteattacks and phishing. Strong security solutions are required to combat these issues. This overview discusses esarange of techniques, such as multifactor authentication, biometric examination, behavior analysis, and token-based authentication, and enhances user authentication and defense against unauthorized access through this method through integration. Organizations can build more robust and secure authentication mechanisms.

Keywords

Security, Stronger User Authentication, Certain Applications, Biometrics, Behavior Analysis, Token-Based Authentication, Security on the Internet, unjustified password Consumption, Risk-Based Reports, Best Practices, Storage of Data, Referrals, Administration.

The AI Revolution in Data Science : Shaping the Future of Analytics



Sibaram Prasad Panda

Decision Ready Solutions, Irvine, California Email : spsiba07@gmail.com

Abstract

The fusion of AI technologies into data science and analytics has dramatically altered the way organizations glean insights from complex datasets. This paper examines the changing interplay between AI methods and traditional analytical methods, underlining critical technological developments, implementation frameworks, and emerging challenges. A recent case study analysis in healthcare, finance, and manufacturing highlights how machine learning algorithms, natural language processing, and computer vision techniques permit an order of pattern recognition and prediction such tasks hitherto unavailable. Finally, we discuss the technical, ethical, and organizational implications that facilitate or hamper successful integration for AI into data-driven decision frameworks. The study presents evidence that AI enhances analytical capabilities appreciably but achieves the most when there are concerted human-AI collaboration models, strong governance frameworks, and domain-specific customization approaches in place.

Keywords

Artificial intelligence, data science, machine learning, analytics, predictive modeling, natural language processing, computer vision, explainable AI

Cybercrime 2.0 : Tackling New Threats with Advanced Forensic Tools

Sibaram Prasad Panda

Decision Ready Solutions, Irvine, California Email : spsiba07@gmail.com

Abstract

This paper examines the rapidly evolving nature of cybercrime and the corresponding advancements in digital forensics techniques crucial for research and prosecution. The studies analyze present day tendencies in cybercriminal activities, inclusive of ransom ware attacks, cryptojacking, supply chain compromises, and the exploitation of emerging technologies. We recommend a multi-tiered digital forensics framework that addresses the demanding situations of anti-forensics strategies, encryption, jurisdictional complications, and the ephemeral nature of virtual proof. Through case studies and quantitative evaluation, this paper demonstrates the effectiveness of advanced virtual forensics methodologies in cybercrime research whilst highlighting continual gaps in capabilities that require in addition studies and improvement. We conclude with pointers for forensic practitioners, law enforcement companies, and policymakers to strengthen the virtual forensics environment towards more and more sophisticated cybercriminal threats.

Keywords

Cybercrime, Digital Forensics, Network Forensics, Anti-Forensics, Ransom ware, Cloud Forensics, Volatile Memory Analysis, Legal Frameworks

Understanding Patient Trust Using Cybersecurity and Blockchain in Healthcare



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Abstract

The primary goal of our initiative, "Understanding Patient Trust and Cybersecurity in Healthcare," is to emphasize how the increasing dependence on digital technologies has made the healthcare industry a prime target for cyber attacks. As the demand for data protection and adherence to regulations grows, this project examines the vital importance of cybersecurity in healthcare, the associated risks, and the necessary strategies to protect patient data and ensure continuous care. Cybersecurity encompasses the protection of systems, networks, and applications against a variety of digital threats. Such cyber attacks often seek to access, modify, or eliminate sensitive information, extort money through ransomware, or disrupt standard operational processes. Electronic Health records (EHRs) serve as a case of delicate data. These records are significant since they hold fundamental quiet points of interest and are regularly shared among diverse substances, such as healing centers, drug stores, and private clinics. It is basic to keep this data exact, current, private, and open as it were to authorized people to maintain a strategic distance from cyber assaults and keep up understanding believe.

Keywords

Cybersecurity, ransomware, EHR (Electronic Wellbeing Record), cyber assaults

Deep Learning Algorithms in the early detection of diseases in Animals



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Shikha Singh

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Abstract

Deep learning (DL), a subset of machine learning (ML) has transformed early disease detection in recent years, with applications in image recognition, natural language processing and speech recognition. In veterinary medicine, DL algorithms including Artificial Neural Networks (ANNs), Convolutional Neural Networks (CNNs) and Recurrent Neural Networks (RNNs) paired with advanced image processing techniques such as Faster R-CNN, YOLOv5, and YOLOv6 enable precise disease detection in animals.

These algorithms utilize layered neural network architectures to identify patterns in complex sample data such as microscopic images, videos or sensor outputs offering a robust alternative to traditional methods.

Conventional methods for examination animal diseases take a lot of time, effort, and need trained experts, which can delay treatment. Deep learning (DL) makes this process faster and more efficient, helping to detect diseases early and improve precision livestock farming.

Although some work has done in the veterinary medicine, the application of DL in veterinary medicine remains in its infancy. By improving diagnostic accuracy, preventing disease spread and lowering treatment costs, DL can help farmers to avoid losses from undetected illnesses and increase farm productivity.

Deep learning can improve animal healthcare, but veterinary experts and technology experts must work together. Smart technology helps to detect diseases better and faster.

Keywords

Machine learning, Deep learning, Image recognition, Convolutional Neural Networks (CNN), Recurrent Neural Networks (RNN), Image processing techniques, Faster R-CNN, YOLOv5, YOLOv6, Early disease detection.

Mr. Abbas Haider

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Abstract

In this modern era, increases overflowing information data and social media influence, the propagation of spoof news has become a significant concern for society. As a promising approach to addressing this challenge, machine learning and deep learning emerges as a promising tool. The paper reviews different machine learning techniques for the detection of fake news, including supervised, unsupervised methods. Using supervised methods, models are trained to differentiate between fake and legitimate news articles using labelled datasets. On the other hand, unsupervised learning methods study data based on clustering and anomaly detection. The paper discusses the evaluation metrics normally used to evaluate spoof news detection models, such as accuracy percentage, precision, recall, and F1 score. Deep learning techniques involve CNN, LSTM for fake news detection. This paper emphasizes the importance of robust evaluation frameworks for ensuring the generalizability and reliability of spoof news detection systems.

Keywords

Spoof news, machine learning, supervised learning, unsupervised learning, deep learning, TF-IDF, Word2Vec, FastText.

The Role of Machine Learning in Modern Healthcare : A Systematic Review



Payal Katara

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Abstract

Machine Learning (ML) is a highly useful tool in the healthcare sector, as it helps doctors, medical professionals and hospitals make better use of medical data. The main objective of this research paper is to explore how ML can address challenges such as analyzing large volumes of medical data, detecting diseases at an early stage, and supporting timely treatment planning.

After reviewing various research papers, we found that several ML algorithms such as supervised learning, unsupervised learning, and deep learning are effective in areas like disease prediction, medical imaging, and patient monitoring. However, our study also highlights certain challenges in implementing ML, including the lack of clean and well-labeled data, concerns around data privacy, and the difficulty in interpreting complex models like deep learning for predicting critical diseases.

This review paper focuses on how different machine learning and deep learning algorithms, particularly Convolutional Neural Networks (CNNs), are used for disease prediction. This paper also explains the essential steps involved in applying ML, such as data preprocessing, feature selection, and model evaluation. Our findings show that ML techniques can achieve high accuracy in detecting diseases such as cancer and heart conditions using data from X-rays, CT scans, MRI scans, and ECG signals.

In conclusion, ML has the potential to significantly improve healthcare by making it faster, more accurate, and more personalized. To fully utilize the potential effectively collaboration between healthcare professionals and data scientists is essential, along with proper data security and responsible use of machine learning tools. This review offers a clear and accessible overview for students, researchers, and healthcare practitioners interested in the future of ML in healthcare.

Keywords

Machine Learning, Medical Science, Disease Prediction, Deep learning, Convolutional neural network Healthcare Decision Support System.

Harnessing Deep Learning for Malware Detection : A Comprehensive Review with Explainable Al Insights



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Prasun Chakrabarti

Department of Computer Science and Engineering Sir Padampat Singhania University, Udaipur, India

Abstract

One of the largest risks to cybersecurity is malware, which is constantly evolving to evade detection by conventional signature-based methods. Specifically, machine learning-particularly deep learningis a potential technique for detecting malware. In this paper we investigated the growing impact of deep learning models in the field of cybersecurity, particularly for malware detection. It outlines how deep learning models like Convolutional Neural Networks (CNN), Recurrent Neural Networks (RNN), and Long Short-Term Memory (LSTM) provide improved detection accuracy with fewer false positives compared to ML techniques. These models are also able to automatically extract highlevel features from large datasets, significantly reducing manual feature engineering efforts. In this paper we also explored integration of Explainable AI, to offer greater transparency in how these models make decisions, making it easier for security analysts to interpret and trust the results.

Furthermore, the survey provides insights into the challenges of detecting modern malware variants and obfuscation techniques, discussing how dynamic deep learning models combined with heuristic methods offer significant advantages over static detection methods. Overall, this paper offers a extensive review of deep learning's role in malware detection, coupled with the importance of explainability for practical deployment in cybersecurity systems.

Al-Powered Enhanced Crop Health Monitoring System Using Drone Remote Sensing Data



Akhil Jain

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Abstract

Real-time crop health monitoring is pivotal for mitigating global food shortages and promoting sustainable agricultural practices. Conventional methods, such as manual field inspections, are laborintensive, costly, and lack scalability. Satellite imagery, while useful for large-scale analysis, suffers from low spatial resolution and infrequent revisit cycles, limiting its utility for early stress detection. This study proposes a novel framework, the Spatio-Temporal Attention Network (STANet), which leverages drone-collected multi spectral data to address these challenges. It combines convolutional neural networks (CNNs) for spatial feature extraction, bidirectional Long Short Time Memory (LSTM) networks for temporal sequence modelling, and dual attention mechanisms to focus on important regions within and across spatial regions and temporal intervals.

Keywords

Precision Agriculture, Spatio-Temporal Attention Network, Crop Health, Sustainable Farming, Early Stress Detection.

Secure and Efficient Academic Record Management : An Overview of Smart Contract-Based Student Record Management Systems in Institutions



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Abstract

Block chain records transactions in a sequential manner through interconnected blocks. Its decentralized and distributed design ensures that data is accessible to all participants within the block chain ecosystem. As one of the emerging technologies in IT, block chain has numerous practical uses. The conventional education system often struggles with centralized data storage, making it vulnerable to data breaches and loss. Implementing block chain for educational data management enhances transparency, security, and accessibility for all stakeholders in the academic environment. This paper presents a block chain-driven record management framework tailored for various institutions. The proposed system utilizes smart contracts to monitor students' academic record. Only verified users can access the private block chain network, with specific roles and access levels governed by the smart contract. Faculty and students serve as primary users—faculty members input records, while students track their profile. The study also includes a comparative analysis of errors found in traditional versus block chain-based systems, examining five error types: transposition, transcription, calculation, omission, and formatting. Notably, the block chain model showed an 86.67% decrease in omission errors compared to manual methods. It also completely eliminated formatting errors, underscoring its consistency and reliability. Thanks to the immutable nature of block chain, academic records remain trustworthy and tamper-proof. In conclusion, the block chain-based solution significantly outperforms traditional systems in terms of accuracy, error reduction, and data reliability.

Keywords

Block chain, Smart Contracts, Consensus Protocol, Distributed Ledger Technology, Conventional Record Management System;

Less is still More : Scalable, Multimodal and Unsupervised Highlight Detection for Web Videos



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Abstract

Video highlight detection plays a critical role in enabling efficient content summarization and navigation in largescale video platforms. Traditional methods often depend on supervised learning with manually annotated data, which limits scalability and adaptation to different domains. In this paper, we present a comprehensive and scalable framework for unsupervised video highlight detection that leverages duration-based weak supervision, enhanced with multiple learning strategies to boost performance, generalization and efficiency.

Our proposed method integrates: (1) temporal sequence modeling utilizing Transformer-based and convolutional architectures to capture contextual relationships; (2) multimodal feature fusion that combines visual, audio, and textual data to augment semantic understanding ; (3) self-supervised contrastive learning to pre-train effective video representation without the need for manual labeling; (4) behavioral supervision through engagement metrics such as replay frequency, likes and skips; (5)meta-learning to enable few-shot adaptation to unfamiliar video domains. Additionally, we introduce model distillation to achieve efficient real-time inference and incorporate explainability mechanisms (e.g., Grad-CAM and LIME) along with user feedback loops to enhance model transparency and support continual learning.

Experimental evaluations on the YouTube Highlights and TV Sum datasets indicate that our framework realizes an improvement of up to 8.4% in mean Average Precision (mAP) compared to previous unsupervised baselines. The system also shows excellent generalization abilities across various video domains, making it ideal for use in environments where low latency is crucial. This versatility allows for practical applications in both extensive cloud setups and edge-based media processing.

Keywords

Artificial Intelligence, Transformer, Unsupervised Machine Learning, Video Highlight Detection

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Abstract

In the fast-changing industrial environment of today, industries such as manufacturing, power generation, and smart transportation are increasingly utilizing interconnected cyber-physical systems made possible by the Industrial Internet of Things (IIoT). While these advancements boost efficiency and automation, they also introduce significant cybersecurity risks. Despite the presence of defenses like encryption and secure authentication, advanced cybersecurity threats such as False Data Injection (FDI) attacks persist in jeopardizing the integrity and dependability of crucial systems. FDI attacks pose a significant threat due to their ability to tamper with sensor data in both physical and cyber domains, posing a risk of severe outcomes such as economic disturbances and endangering human lives, as seen during events like the Ukraine blackout. This research aims to tackle these issues by utilizing the Edge-IIoTset dataset, a detailed and practical dataset tailored for IoT and IIoT cybersecurity purposes. After completing thorough exploratory data analysis and implementing advanced data preprocessing techniques, we recommend a hybrid machine learning model that combines XGBoost and Multi-Layer Perceptron (MLP). This work highlights the critical need for intelligent, data-driven intrusion detection systems to protect the next generation of smart industrial infrastructures.

Keywords

False Data Injection Attack, Industrial Internet of Things (IIoT), Edge-IIoTset Dataset, Cybersecurity, XGBoost, Multi-Layer Perceptron (MLP), Intrusion Detection System (IDS), Machine Learning, Smart Infrastructure, GridSearchCV

Predictive Modeling for Garuda Indonesia : A Comparative Analysis of XG Boost, TFT, CNN, Facebook Prophet, H2O AutoML and MLR model



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Abstract

Stock shares represent fractional ownership in a company, allowing individuals to participate in the financial success of the organization. The attract of shares lies in their potential for investment and savings, offering returns that correspond with the growth and performance of the company. Numerous factors influence share prices, which can be both internal and external to the organization. This study takes a closer look at the stock price movements of Garuda Indonesia, traded under the code GIAA. As one of Indonesia's top airlines, Garuda Indonesia provides a strong example for applying advanced forecasting techniques to predict stock trends. In this research, a comparative analysis will be conducted using various predictive models, including XGBoost, Temporal Fusion Transformer (TFT), Convolutional Neural Networks (CNN), Facebook Prophet, H2O AutoML, and Multiple Linear Regression (MLR). The goal is to provide fresh insights for fellow researchers and investors by incorporating stock price data alongside the exchange rates between the Indonesian Rupiah (IDR) and the U.S. Dollar (USD). This comprehensive approach aims to enhance decision-making in stock investment strategies.

Keywords

XGBoost, TFT, CNN, Facebook Prophet, H2OAutoML and MLR model

Cracking the code : Unlocking the future of instant connectivity



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Abstract

In an era driven by immediacy and seamless digital interaction, Quick response codes or QR codes have come to light as a vital bridge between digital and physical world. Through a quick response code, users can access information via a digital device. We've explored the evolution of QR technologies, examining its expanding role in different fields such as marketing, healthcare, education and analyze the risk and security of using QR codes. Recent statistics indicates a 43.2% growth in QR code usage since 2022, with 59% of consumers scanning the QR codes daily. According to a survey, younger demographics; 45% of Gen Z and Millennials are more likely to engage with interactive elements like QR codes. QR codes scan data as pixels in a square-shaped grid and it is prone to Cyber Attacks. By analyzing technical enhancements, adoption trends and user engagement matrix, this study reveals how QR codes are reshaping the Ecosystem of immediate connectivity. Additionally, Quick-Response Code Payment Attacks, Quick-Response Information Leakage, and Quick-Response Attacks are all potential security threats for Quick-Response codes. Barcodes can be maliciously used to run different attacks such as phishing, malware propagation, cross-site scripting and structured overly language/command injection and ready application attacks. There has been an increase of 270% in QR code phishing attacks reported in 2024, which is significantly higher than previous years. It is important to note that, the number of QR attacks on executives has been disproportionately high, with 40 times more than on other employees. Through this comprehensive analysis and real-world case studies, this work highlights the growing potential of QR codes as powerful tool as well as security threats. The study also evaluates current mitigation strategies and recommendation to enhance QR code security, ensuring their safe and effective use in an increasingly connected world.

Keywords

Quick-Response code, Security Threats, Cyber Attacks, Gen Z and Millennials, Connected world.

Studies on Bihar's non-traditional energy potential, with an emphasis on solar and bioenergy sources using ARIMA

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Abstract

Traditional fossil fuel-based generation is inferior to renewable energy sources. However, because of their strong reliance on environmental factors, renewable energy generation is intermittent. This makes it extremely difficult to integrate them into our current grid and calls for appropriate forecasting algorithms. The increasing need for energy and the speed at which industrialization is occurring have made it necessary for several recent researches to forecast renewable energy. In this work ,a model has been established and tested for predicting the livestock population of Bihar till the year 2040 by using simple and famous statistical time model ARIMA .Its satisfy all the criterion. Finally this work can be used for building block for further research into forecasting of livestock population.

Keywords

Forecasts, ARIMA, Energy, Renewable



Natural Language Processing & Large Language Models : Advancements, Applications, and Challenges

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Abstract

Tracing their development from early statistical techniques to contemporary transformer-based designs, this article offers a thorough survey of Natural Language Processing (NLP) and Large Language Models (LLMs). We look at the basic technological developments that have made possible the recent spectacular gains in language creation and comprehension capacity. While critically discussing ongoing issues in the field such as bias, hallucinations, and resource needs, the study studies important applications in several sectors including healthcare, finance, education, and software development. We end by talking about the societal wider consequences of these technologies and potential research paths. Although LLMs are a major advancement in artificial intelligence, our study shows that ongoing development depends on addressing interpretability, efficiency, and alignment with human values.

Keywords

natural language processing, large language models, transformer architecture, deep learning, AI safety, computational linguistics

Helmet and Number Plate Detection System using Yolo-v10



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Abstract

In today's fast-paced urban environments, ensuring road safety and enforcing traffic regulations have become critical. A significant number of road fatalities stem from motorcycle riders who fail to wear helmets, highlighting the need for an automated monitoring system. This study presents a deep learning-powered system that integrates the YOLO-v10objectdetectionframeworkwithOpticalCharacter Recognition (OCR) for real-time helmet and license plate recognition. YOLO-v10, known for its balance of speed and precision, detects motor cyclists and verifies helmet usage, while OCR extracts license plate details when violations occur. Trained on a custom dataset representing various real-world conditions, our model delivers accurate and efficient performance, making it suitable for smart traffic management and automated law enforcement. The system's real-time capabilities, validated through experiments, demonstrate its potential to significantly boost compliance and enhance public safety.

Keywords

Yolov10, OCR, Helmet detection, Number plate detection, Object detection, Deep Learning.

Al-Driven Revenue Optimization for Online Insurance Recommendations



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Abstract

The rise of digital insurance platforms presents challenges in designing recommendation systems that not only enhance customer engagement but also maximize overall revenue. Traditional approaches often emphasize conversion rates, overlooking the financial impact of product selection. This study proposes a multi-task learning framework that refines recommendation accuracy across various customer segments by mitigating data sparsity and adapting to diverse sales scenarios. Additionally, a reinforcement learning-based ranking strategy is introduced to optimize product visibility while prioritizing revenue generation. Extensive real-world evaluations demonstrate notable improvements in both conversion rates and profitability, highlighting the potential of AI-driven strategies in the insurance sector.



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Abstract

Accurate estimation of flood-related property dam- age is critical for improving insurance risk assessment and policy pricing. This study applies advanced machine learning techniques to predict insurance claims for flood-related damages using historical data from national flood insurance programs. The proposed framework integrates geospatial, meteorological, and economic variables to enhance predictive accuracy. By leveraging models such as extreme gradient boosting, generative adversarial networks, and Gaussian processes, the research demonstrates sim-proved forecasting of financial losses and claim distributions. The results highlight the effectiveness of data-driven methodologies in optimizing underwriting decisions and supporting risk mitigation strategies. These findings provide valuable insights for insurers seeking to enhance catastrophe modeling and policyholder risk evaluation.

Next-Generation DNS Security : A Machine Learning-Driven Approach with Federated Learning and Privacy-Preserving Techniques



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This work introduces an adaptive DNS threat prevention system that combines real-time machine learning, privacypreserving mechanisms, and federated learning to provide robust security while being compliant with privacy laws. The system takes advantage of lean machine learning models to classify DNS queries in real time, capturing malicious patterns not seen by conventional blacklist-based techniques. Feature selection and feature engineering techniques extract most informative features from DNS traffic, employed for rapid classification with low computational expense. To guarantee privacy concerns are met, the system uses privacy-preserving data structures such as encrypted Bloom filters and homomorphic encryption such that threat intelligence can be exchanged by organizations without revealing sensitive information thereby safeguarding anonymity. Federated learning is integrated to assist with decentralized model training for networks to enhance resistance to new threats without compromising data privacy. The distributed configuration allows for ongoing model updates to improve detection models to be more robust against novel attack techniques such as DNS tunnelling, which can covertly exfiltrate confidential information. The research also explores the application of unsupervised learning techniques such as One-Class SVM and clustering algorithms to detect novel attack vectors that are unknown. To verify our design, we thoroughly examine our system using real DNS datasets and simulated attack datasets. Performance metrics such as detection accuracy, false positives, processing delay, and privacy satisfaction show that our system far outperforms conventional DNS security approaches. Experiments show enhanced real-time threat detection capabilities, lower false positives, and negligible loss in DNS resolution latency, which renders the solution suitable for implementation in high-speed networks.

Keywords

DNS Security, Machine Learning, Federated Learning, Real-Time Threat Detection, Privacy-Preserving Techniques, DNS Tunnelling, Adaptive Security, Network Anomaly Detection, Cyber Threat Intelligence, Homomorphic Encryption.

Personalised Learning Pattern Analysis Based on Student's Data



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Abstract

In recent years, with the continuous progress and development of science and technology, particularly in the fields of artificial intelligence, machine algorithm and other technologies, the education system has also begun to carry out more personalized content from traditional functions. Traditional education systems typically adopt a one-size-fits-all model, which often fails to address the unique learning needs and styles of individual students. An education system personalized and optimized by machine learning algorithms can provide customized learning materials and recommendations based on each student's learning history, interests and abilities to improve learning outcomes, and machine learning algorithms can provide real-time feedback on student performance and adjust learning plans based on feedback. This makes the learning process more dynamic and personalized. It can therefore be applied to all types of education, including language learning, mathematics, science, etc. However, improving the efficiency of machine learning algorithms depends more on the improvement of numerical optimization algorithms, so it is necessary to summarize the optimization algorithms in large-scale machine learning. This paper tries to make a detailed overview of the existing machine learning algorithms optimizing personalized education recommendation system and introduces the algorithm optimization process.

Keywords

Recommendation system, Algorithm, Personalized learning, Recommendation approach, E-learning

Prompt Engineering in NLP : Unlocking the Power of Large Language Models

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Abstract

This document analyzes the history of the development of prompt engineering in the field of Natural Language Processing (NLP) and its effects on Large Language Models (LLMs). It discusses the evolution of NLP from traditional methods to the emergence of zero-shot and few-shot learning techniques and how prompt construction changed NLP's landscape. The authors cover historical contextuality, practical relevance, and the latest progress in automated prompt engineering, providing critical insights, research deficiencies, and prospects for further development. It is also noted how the ethical aspects of prompt engineering, particularly bias and fairness, require more attention on responsible prompt design.

Keywords

Automated Prompting, Ethics of AI, Bias, Multilingual NLP, Zero and Few Shot Learning, Natural Language Processing, AI Powered Chat, Prompts Engineering.

B

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Abstract

The present invention describes the integration of a nichrome wire loop, forceps, straight needle, and metal spreader with an AI-driven thumb system, designed to improve precision and efficiency in laboratory and medical tasks. The nichrome wire loop is used for streaking and inoculating microbial cultures, the forceps enable precise manipulation of small or delicate objects, the straight needle ensures accurate punctures or injections, and the metal spreader facilitates the even spreading of microbial cultures. The AI-based thumb system enhances these tools by providing advanced control, real-time adjustments, and automated feedback, ultimately reducing human error and improving accuracy. With its adaptive capabilities, the AI system dynamically adjusts to the specific requirements of each procedure, optimizing the performance of each tool and enabling seamless integration. This innovation aims to streamline complex tasks, enhancing both operational efficiency and precision in laboratory and clinical settings.

Keywords

AI, Wireloop, Straight needle, Metal Spreader, Forceps

Al Driven Smart Hybrid Phytoreactor with Electrocoagulation for the Effective Management of Domestic Wastewater

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Abstract

AI assisted combined electrocoagulation-phytoremediation process could be a promising technology for treating domestic wastewater. The maximum COD and BOD removal efficiency was observed 76% and 78% respectively by using this coupled process. Working principle of this coupled Electrocoagulation and Phytoremediation process is that metal electrodes (iron) release metal ions into the water. The ions form hydroxides, which act as coagulants to remove impurities. Pollutants in the form of sludge are separated by flotation, or filtration. Along with electrocoagulation, this treated water is exposed to roots of Heliconia spp. and the COD, BOD removal has been checked. Fish Toxicity Studies and Plant Toxicity Studies revealed that after treatment water is totally safe for survival of plants and animals Oxidoreductase enzymes of plants acts on the ionized intermediate molecules formed after electrocoagulation and caused effective pollutant removal from wastewater. Sludge management can be done by subjecting it for compost and brick making and our research is still underway. This research endorse zero waste discharge of harmful substances in to the environmental sinks Smart AI based Phytoreactor can be applied in a parks as constructed wetland or in society for wastewater management.

Keywords

Electrocoagulation, Phytoremediation, Domestic wastewater, AI



Some Plant Based Alternatives to the Animal Based Food

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Abstract

We mainly receive food from two sources one is plant based and the second is animal based but in science the animal based food source like meat is also come indirectly from plants because we grow livestock by feeding them plant based food but animals are an inefficient wave of conversion of energy because they can only convert 10 percent energy the intake and apart from this reason there are multiple other reasons for why the livestock is harmful for the environment the livestock produces about 18 percent of the global greenhouse emission which is larger than the whole transportation system on the world apart from this they are extremely inefficient in terms of resources because compared to plant based food animal based food requires about 20 to 100 times more land and water resources to produce same amount of food as by many researches they have predicted that the globe population will reach about more than nine billion peoples in future but we are and the requirement of meat will get double almost so we need to find an alternative to the livestock to fight the climate change some companies are trying to do just this there are two approaches to replace meat in the future one is on plant based meat in this they try to mimic the actual component ratio of meat its flavour texture from totally plant based components like protein from pea plant oil from coconut and red colour from beet root this way we can shift the meat eating peoples to eat the same flavour meat but 100 percent plant based and the second approach is called cultivated meat or lab grown meat in this method we take some samples of cells from the body of animals then use bioreactor to grow these cells we provide all the essential amino acids and nutrients in the bioreactor to the cells this way we do not need to use antibiotics to the animals.

Keywords

Plant Based, Food, Livestocks, Animal Based Food, Environmental Harm, Green House Emission ,Resource Inefficiency, Population Growth, Mimic Meat, Bioreactor, Cultivated Meat



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