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# RESEARCH BULLETIN

*Connecting Ideas, Shaping Impact*

**VOL. 2 | ISSUE 1 | 2025**



**DEPARTMENT OF  
COMPUTER APPLICATION**





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## DEPARTMENT OF COMPUTER APPLICATION



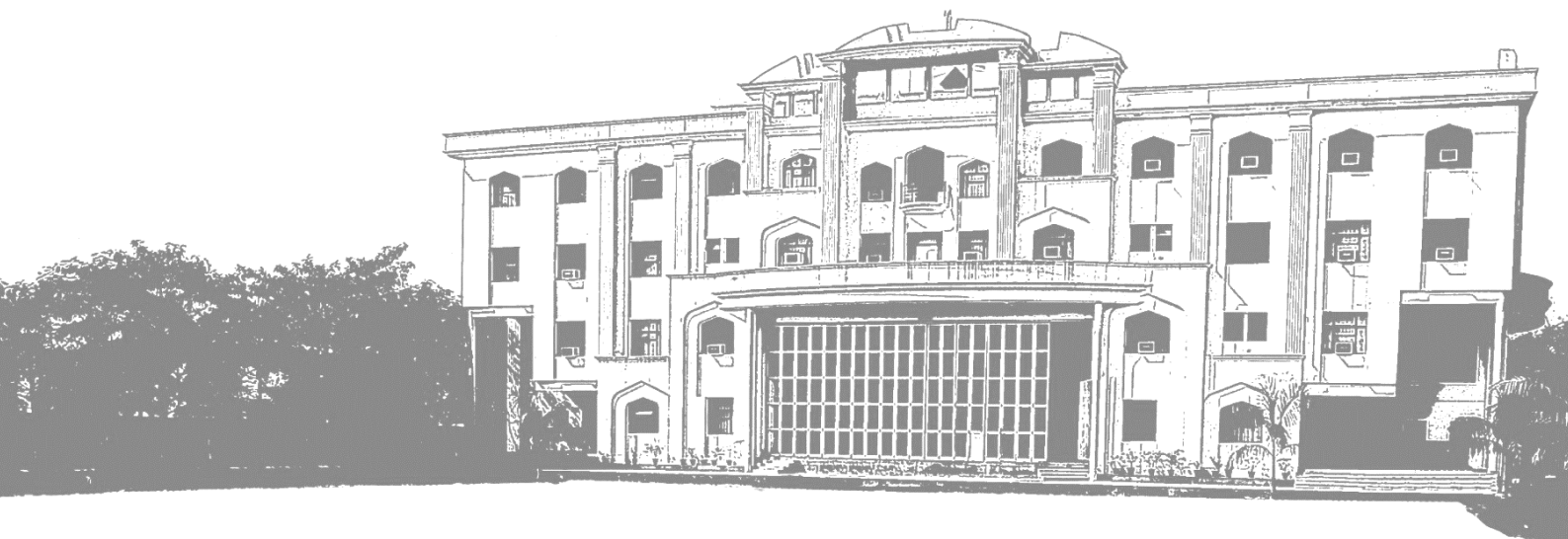
### RESEARCH BULLETIN Volume 02 | Issue 01

It is with great pleasure that we present Volume 2, Issue 1 of the **Research Bulletin** of the **Department of Computer Application**, Integral University, covering the period from **1 January 2025** to **30 June 2025**. This edition highlights the significant research contributions made by our faculty members and scholars during the first half of the year.

The field of Computer Applications continues to advance rapidly, driven by breakthroughs in artificial intelligence, cybersecurity, data science, and emerging technologies. Our department remains committed to fostering a vibrant research culture, as reflected in the diverse range of publications, projects, and innovations featured in this issue. These endeavors not only enhance academic excellence but also address real-world challenges, reinforcing our dedication to technological advancement and societal impact.

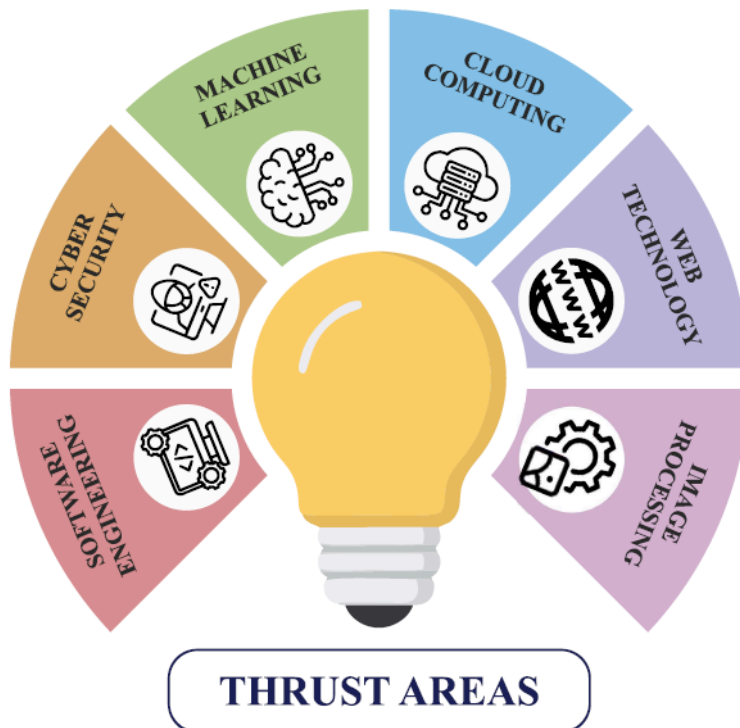
We extend our sincere appreciation to all researchers for their dedication, creativity, and hard work that have enriched this bulletin. We are also deeply grateful to the university leadership for their continuous encouragement and support in promoting research and development. We hope that this compilation will serve as a valuable source of knowledge and inspiration for future research collaborations and innovations.

Warm regards,  
Dr. Mohammad Faisal  
Professor & Head  
Department of Computer Application





## DEPARTMENT OF COMPUTER APPLICATION



## RESEARCH PROFILE OF CA

1	Enrolled Research Scholar	43
2	Awarded PhD Degree	31
3	Journal Publications	168
4	Conference Preceeding	85
5	Book Chapters	124
6	Books	22
7	Patents	20
8	Project	2



## Research Articles

### Enhancing Healthcare Data Privacy in Cloud IoT Networks Using Anomaly Detection and Optimization with Explainable AI (ExAI)

Virendra Singh et al.

(Computers, Materials & Continua, 2025)

Internet of Things (IoT) and Explainable AI are integrated in this study to develop a novel method for privacy-preserving anomaly detection in cloud-based healthcare systems. Utilizing the Radial Boltzmann Gaussian Temporal Fuzzy Network (RBGTFN) for anomaly identification and Remora Colony Swarm Optimization for model tuning, the system enhances data protection. The study demonstrates high performance with 98% detection accuracy and strong results in precision, latency, QoS, and scalability, validating its healthcare applicability.

[Read more](#)



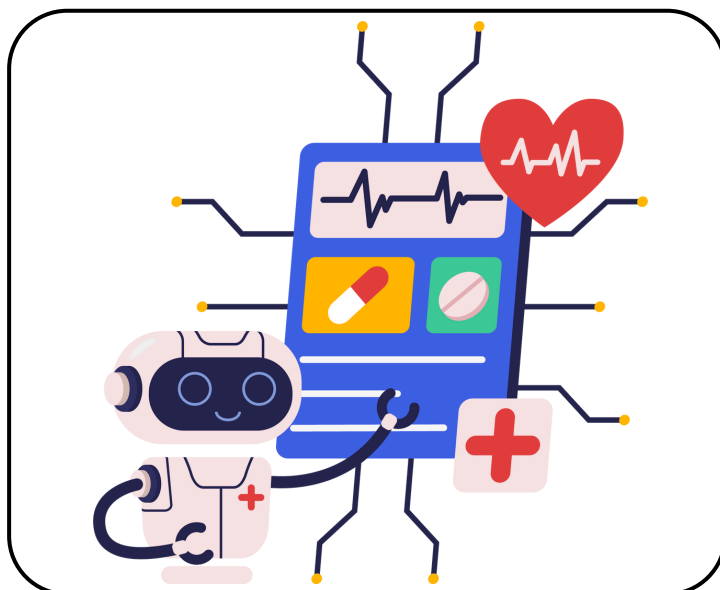
### Assessment and Prioritization of AI-Enhanced Blockchain Factors in Healthcare Supply Chains: A Hybrid Multi-Criteria Decision-Making Approach

Vishal Agarwal et al.

(International Journal for Research in Applied Science & Engineering Technology, 2025)

Blockchain and artificial intelligence (AI) are integrated in this study using a hybrid Fuzzy Analytic Hierarchy Process (F-AHP) and Fuzzy Decision-Making Trial and Evaluation Laboratory (F-DEMATEL) to evaluate key factors impacting healthcare supply chain optimization. This study identifies and ranks four main criteria and 23 sub-criteria, revealing “treatment integration,” “health monitoring,” and “medical data security” as top priorities. Causal-effect analysis underscores the importance of stakeholder involvement and patient-centered strategies.

[Read more](#)





## A Novel Machine Learning Hybrid Model for Heart Disease Risk Assessment

Tasneem Ahmed et al.

(AIP Conference Proceedings, 2025)

Machine learning (ML) techniques such as logistic regression, decision tree, random forest, ANN, naïve Bayes, KNN, and SVM are used in this study to build a predictive model for heart disease risk assessment. Through structured phases of data pre-processing, feature selection, and model evaluation, the approach enhances early detection capabilities and supports personalized healthcare strategies, highlighting ML's potential in improving cardiovascular health outcomes globally.

[Read more](#)



## Framework for Securing Crowdsourcing Platform for Internet of things using Machine Learning

Mohammad Faisal et al.

(Journal of Information Systems Engineering & Management, Volume 10, 2025)

Reinforcement Learning (RL) algorithms are used to develop a dynamic and adaptive security framework for IoT-based crowdsourcing platforms. By continuously optimizing security policies in response to real-time threats and system conditions, this study enhances security efficacy, reduces resource consumption, and accelerates adaptation speed. Experimental evaluations under various attack scenarios show that RL-driven frameworks outperform static policies, ensuring resilient and efficient IoT security management.

[Read more](#)





# A Fusion Framework for Hinglish Cyberbullying Detection Using mBERT And FastText

Mohd Waris Khan et al.

(International Journal of Engineering in Computer Science, Volume 7, 2025)

Natural Language Processing (NLP) techniques, including FastText and fine-tuned BERT, are integrated in a dual-stream architecture to build the Hinglish Fusion Framework for cyberbullying detection. This study leverages subword-level embeddings from FastText and contextual language understanding from BERT to improve detection accuracy in code-mixed Hindi-English text. The approach supports robust, scalable moderation systems tailored for multilingual and low-resource social media environments.



## Read more

# A Conceptual Framework for Leveraging Web Data in Sentiment Analysis and Opinion Mining

**Nadiya Parveen & Mohd Waris Khan**

(Journal of Information Systems Engineering & Management, Volume 10, 2025)

Machine Learning and Natural Language Processing (NLP) are integrated in a conceptual framework to perform sentiment analysis and opinion mining on unstructured web data such as social media and blogs. This study introduces sentiment-specific crawlers and ontologies to boost detection accuracy. Validated through cross-industry case studies, the framework enhances insight generation and demonstrates robustness in extracting sentiment from large-scale, dynamic online content.



## Read more



## ADNeuroNet: A Neuroevolution-Based Neural Network Algorithm for The Diagnosis of Neurodegenerative Diseases

Afreen Khan et al.

(Neural Computing and Applications Volume 37, 2025)

Neuroevolution-based neural networks (NNs) are applied in developing ADNeuroNet, a predictive model designed to classify cognitively normal, mild cognitive impairment, and Alzheimer's disease (AD) cases. By integrating cognitive and demographic clinical data from the Alzheimer's Disease Neuroimaging Initiative (ADNI), this study builds a robust algorithm achieving 93.42% accuracy. The model demonstrates potential as an early diagnostic tool for neurodegenerative disorders using only baseline patient information.

[Read more](#)



## Enhancing Security and Performance of gRPC-Based Microservices using HTTP/3 and AES-256 Encryption

Muhammad Kalamuddin Ahamad et al.

(Journal of Information Systems Engineering & Management, Volume 10, 2025)

Google Remote Procedure Call over HTTP/3 and QUIC, integrated with AES-256 encryption and HMAC-based integrity checks, forms the foundation of a secure, low-latency communication framework for microservices architectures. Designed to overcome the shortcomings of HTTP/2 and TLS 1.2, particularly within Kubernetes-based distributed systems, this study demonstrates how QUIC's UDP-based transport enables faster connection establishment, connection migration, and stream-level multiplexing without head-of-line blocking. Performance evaluations report a 15% improvement in throughput and 20% reduction in latency, confirming the framework's potential for secure and efficient microservices deployment at scale.

[Read more](#)



## Sustainable Healthcare Through IoT And Pervasive Computing:

### A Reinforcement Learning Approach

Pankaj Kumar et al.

(Journal of Neonatal Surgery, Volume 14, 2025)

Reinforcement learning integrated with IoT and pervasive computing forms the backbone of an AI-driven healthcare framework designed to optimize patient care and resource allocation. Centered around a Dispersed and Elastic Computing Model, this study leverages recurrent reinforcement learning to enable adaptive, low-latency decision-making across distributed medical environments. Simulations demonstrate enhancements in diagnostic accuracy, energy efficiency, and system scalability, underscoring its potential for sustainable, next-generation digital healthcare systems.

[Read more](#)



## Evaluating the Impact of Security Risks through Fuzzy AHP-TOPSIS Method

Mohd Shabbir & Mohd Waris Khan

(Journal of Information Systems Engineering & Management, Volume 10, 2025)

Multi-Criteria Decision-Making (MCDM) is utilized in this study to enhance software security during the Software Development Life Cycle (SDLC). By integrating AHP and TOPSIS, the study identifies and ranks risk-related criteria during the requirement engineering phase. This approach supports secure software development through effective prioritization of risk factors, offering practical insights for improving usability and mitigating security threats in the digital age.

[Read more](#)





## A Comprehensive Study of Detection Methods for Deceptive Content Across Social Media Platforms

Priya Sharma & Mohd Waris Khan

(Journal of Information Systems Engineering & Management, Volume 10, 2025)

Fake news detection is the core focus of this review, which analyses 20 studies from 2018 to 2024 to assess evolving approaches. The study highlights trends such as deep learning adoption (40%), hybrid model use (25%), and the growth of multimodal analysis across text, images, and videos. While BERT-based models achieved up to 99% accuracy, challenges in computational cost, standardization, and dataset diversity remain. Future directions include real-time detection and adversarial robustness.

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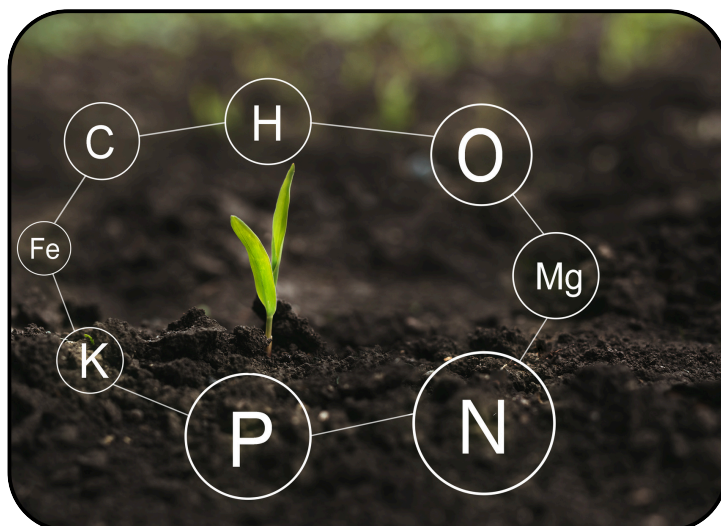
## A Machine Learning-Based Framework for Detecting Crop Nutrients Deficiencies.

Mohammad Arif Ali Usmani & Ausaf Ahmad

(Journal of Information Systems Engineering & Management, Volume 10, 2025)

Machine learning is leveraged in this study to automate the detection of crop nutrient deficiencies, targeting Nitrogen, Phosphorus, and Potassium using 1,156 leaf images. The study applies five feature selection techniques and evaluates seven models, with Random Forest reaching 87.62% accuracy and MLP recording the top F1-score of 81.84%. This study demonstrates machine learning's potential in real-time nutrient diagnosis, supporting precision agriculture and sustainable farming practices.

[Read more](#)



## Predictive Maintenance and Monitoring of Industrial Compressors

### Using Machine Learning: A Proactive Approach

Tariq Sagheer et al.

(Metallurgical and Materials Engineering, Volume 31, 2025)

Internet of Things (IoT) combined with machine learning forms the core of this predictive maintenance framework for industrial air compressors. The system uses multi-sensor data acquisition to monitor temperature, pressure, and flow rate, feeding it into a cloud-based SQL database for real-time analytics. A Linear Regression model predicts anomalies with 98% accuracy, triggering email alerts for timely intervention. This approach enhances operational safety, asset longevity, and cost-efficiency in industrial environments



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## Implementing Computer Vision for Tracking and Monitoring Rehabilitation

### Progress in Patients with Orthopaedic Injuries

Bably Dolly et al.

(Journal of Neonatal Surgery, Volume 14, 2025)

Computer vision-based tracking systems are used to enhance orthopaedic rehabilitation by enabling markerless motion capture, AI-driven kinematic and kinetic analysis, and remote real-time monitoring. This technology allows for automated, data-based evaluations of joint movement and gait using machine learning, augmented reality rehabilitation, and IMU sensors. Integrated within cloud-based frameworks, the approach improves scalability, patient engagement, and clinical efficiency, offering secure, affordable, and personalized rehabilitation in both inpatient and outpatient settings.



[Read more](#)



## Soft Computing-Driven Framework for Enhanced Security in Medical Image Transmission

Satish kumar et al.

(Proceedings of the National Academy of Sciences, India Section A: Physical Sciences, 2025)

Soft computing techniques are applied in this study to enhance the security of medical image transmission (SoMIT) within hospital networks. Using a Hybrid Fuzzy-AHP method under Multiple-Criteria Group Decision Making (MCGDM), the research prioritizes five key security parameters—integrity, authentication, confidentiality, access control, and availability—with integrity being most critical. Achieving an optimized security score of 0.8075, the study demonstrates improved robustness and outperforms other MCGDM methods, contributing significantly to secure and efficient healthcare data transmission.

[Read More](#)



## IoT in Healthcare: Transforming Patient Care with Engineering, Computer Science, and Medicine

Motashim Rasool et al.

(EKSPLORIUM – Buletin Pusat Teknologi Bahan Galian Nuklir, Volume 46, 2025)

Internet of Things (IoT) integrated with machine learning forms the backbone of this smart healthcare framework, enabling real-time monitoring and accurate diagnostics. Using simulated patient data, four algorithms—ANN, RF, SVM, and KNN—were evaluated, with ANN achieving the highest accuracy at 94.6%. The system demonstrates enhanced diagnostic reliability, reduced healthcare costs, and improved patient outcomes, while emphasizing future integration with secure technologies like blockchain for scalability and trust.

[Read more](#)



## An Approach to Develop a Model to Detect the Phosphorus and Potassium Deficiency in Paddy Crop on Agriculture Farm Using DIP & ML

Mohammad Arif Ali Usmani & Ausaf Ahmad

(Fusion: Practice and Applications, Volume 18, 2025)

Leaf Color Chart (LCC)-based nutrient estimation leverages visible leaf greenness as a proxy for chlorophyll and nutrient levels, especially nitrogen. This research extends the traditional use of LCC by experimentally enhancing its dataset to estimate potassium and phosphorus needs in rice crops. By reducing dependence on costly tools like SPAD meters, the study supports low-cost, real-time fertilizer management, promoting environmental sustainability, yield optimization, and cost-effectiveness for small-scale farmers.

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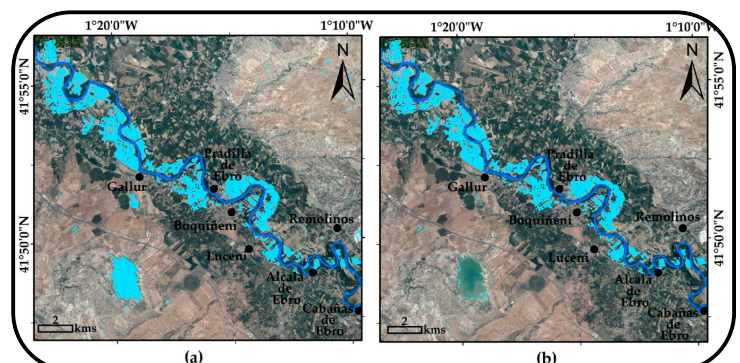
## CCD-Conv1D: A Deep Learning Based Coherent Change Detection Technique To Monitor And Forecast Floods Using Sentinel-1 Images

Tasneem Ahmed et al.

(Remote Sensing Applications: Society and Environment, Volume 37, 2025)

Synthetic Aperture Radar (SAR)-based flood monitoring employs coherent change detection and deep learning to track inundation patterns. This study introduces CCD-Conv1D, a hybrid model integrating SAR image analysis, segmentation, and Conv1D-based forecasting for mapping floods in Ayodhya and Basti. Enhanced accuracy and significant positive threshold shifts highlight model reliability. The study supports CCD-Conv1D's effectiveness in developing flood monitoring and early warning systems for disaster-prone North-Indian regions.

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## Mathematical Insights into Framework Design for Ethical and Cyber-Secure Smart Cities

**Mohd Faizan Farooqui & Mohd Waris Khan**

**(Journal of Information Systems Engineering & Management, Volume 10, 2025)**

Internet of Things (IoT) forms the backbone of this smart city framework, enabling solutions for pollution control, public safety, energy use, and infrastructure efficiency. This study develops interactive models using Intuitive Fuzzy DEMATEL and IF-AHP within a multi-criteria decision-making (MCDM) context to evaluate 23 smart city development factors. Results highlight Smart Living and Governance (SLG) as most impactful, guiding effective and sustainable smart city planning in countries like India, UAE, and Morocco.

[Read more](#)



## Implementation and Validation of a Digital Privacy Framework for Crowdsourced IoT Data Processing

**Santosh Kumar & Mohammad Faisal**

**(Journal of Information Systems Engineering & Management, Volume 10, 2025)**

Internet of Things (IoT)-based anomaly detection lies at the core of this privacy-preserving crowdsourcing framework, which integrates differential privacy, homomorphic encryption, and federated learning. Built using Flask and Isolation Forest, the model ensures secure data collection, anonymization, and analysis while maintaining a strong balance between utility and privacy. It offers a robust solution for deploying secure crowdsourced IoT applications in real-world environments.

[Read more](#)



## Deep Learning and Cnns in Ophthalmology: Toward Accurate and Explainable Diagnosis

Nausheen Fatma, Mohammad Isha Mansoori & Imtiyazul Haq

(Journal of Neonatal Surgery, Volume 14, 2025)

Nonvolutional Neural Networks (CNNs) have transformed ophthalmic diagnostics by enabling precise detection and classification of diseases like diabetic retinopathy, glaucoma, AMD, and cataracts using fundus and OCT images. This study builds a deep learning framework that combines CNN-based classification with severity assessment via image segmentation, delivering both diagnosis and lesion quantification. Explainable AI tools—saliency maps and attention layers—enhance transparency, supporting trust and real-world clinical adoption, especially in remote and resource-limited ophthalmic care settings.

[Read more](#)



## Smart Diagnosis of Rose Leaf Diseases using Advanced Image Processing and Machine Learning

Nausheen Fatma, Dr. Abida Khanam & Dr. Kashif Asad

(Journal of Information Systems Engineering & Management, Volume 10, 2025)

Image processing and machine learning form the foundation of a smart framework developed for early detection and classification of rose leaf diseases. The system employs contrast enhancement, segmentation, and noise reduction for feature optimization, then classifies diseases using a hybrid model combining CNN, SVM, and KNN. This approach achieves superior accuracy and efficiency, enabling real-time, scalable diagnostics and offering a promising tool for sustainable and automated floriculture.

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## A Comprehensive Review of Privacy-Preserving Techniques in Health Data Analysis

**Safikur Rahman Khan & Mohd Waris Khan**  
(IEEE Xplore, 2025)

Computerized systems in healthcare generate vast volumes of data from sources like EHRs, wearable devices, and health apps, offering opportunities for personalized care and research. This review explores privacy-preserving methods for analyzing sensitive health data, emphasizing techniques that enable secure insights without compromising patient confidentiality. It assesses current practices, their effectiveness, and limitations, highlighting the critical need for secure, trustworthy data handling in real-world healthcare environments.

[Read more](#)



## A Review of Digital Forensics Techniques and Emerging Trends

**Priya Sharma & Mohd Waris Khan**  
(IEEE Xplore, 2025)

Machine learning plays a pivotal role in digital forensics by enabling pattern recognition and behavioral analysis across large volumes of digital evidence from diverse devices. Expanding beyond traditional computer forensics, digital forensics now includes all data-storing devices. Investigators extract and secure evidence, which is later analyzed and presented for legal proceedings. Integrating AI-based tools enhances remote analysis, helping to detect and prevent cybercrimes through intelligent, automated processes.

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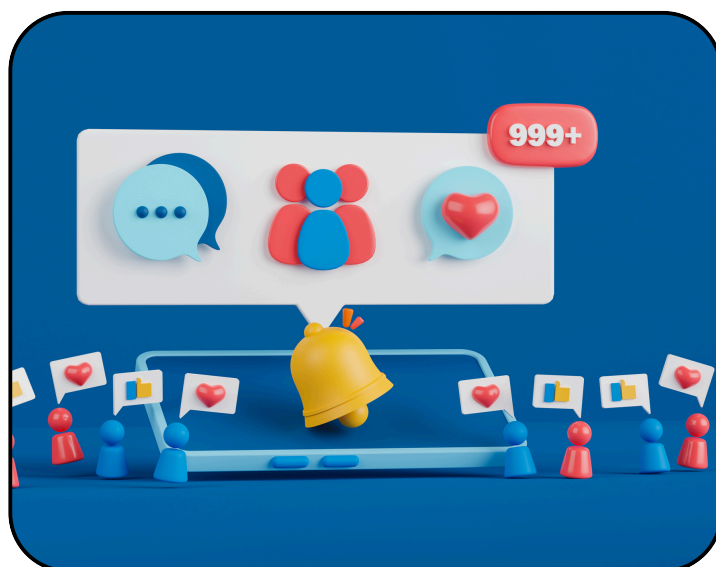
## Leveraging Emoticon Scores for Improved Sentiment Detection in Social Media Using Machine Learning Techniques

Nadiya Parveen & Mohd Waris Khan

(IEEE Xplore, 2025)

Natural language processing and logistic regression techniques form the backbone of a sentiment analysis system developed to interpret user emotions on social media, including emoticon-rich content. This approach involves systematic data collection, preprocessing, and classification using film review datasets of varying sizes. Among the classifiers tested—Naïve Bayes variants, Logistic Regression, and SVM models—logistic regression delivered the most accurate results, while SVM demonstrated improved performance with larger datasets.

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## Securing Cloud-Based Systems: DDoS Attack Mitigation using Hypervisor-Intrusion Detection Approach

Virendra Singh et al.

(Procedia Computer Science, Volume 259, 2025)

Cloud and virtualization technologies enable scalable environments but also expose systems to evolving cyber threats, particularly DDoS attacks. This paper proposes a Hypervisor Controller-based detection system using Fuzzy Time Series Analysis and Expectation Maximization to enhance cloud security. The dual-phase approach classifies SLA violations and further analyses legitimate requests to detect anomalies. The method improves detection accuracy and system resilience, offering a robust solution to safeguard federated and cloud-integrated environments.

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## Detection and Analysis of Crop Stresses in Precision Agriculture Using Sentinel-2 Images

Gausiya Yasmeen & Tasneem Ahmed  
(IEEE Xplore, 2025)

Remote sensing using satellite imagery is a powerful tool for detecting crop stress and supporting precision agriculture. This paper utilizes Sentinel-2 satellite imagery to monitor crop stress near Gonda, Uttar Pradesh, India. Various vegetation indices—NDVI, NDWI, GNDVI, PSSR, and Aphid Index—are analyzed to identify abiotic (e.g., drought, salinity) and biotic (e.g., pests, weeds) stress factors. This approach enhances early detection and precise intervention, improving agricultural productivity and sustainability.

[Read more](#)



## Analyzing and Detecting the Fake News using Machine Learning

Motashim Rasool et al.  
(IEEE Xplore, 2025)

Machine learning algorithms, natural language processing (NLP), and social network analysis are employed to detect fake news. Various feature types—textual, metadata, and social context—are extracted to enhance detection accuracy. The paper reviews fake news detection techniques across three categories: feature-based, machine learning, and network analysis. The proposed model achieves a classification accuracy of 99.70% and discusses limitations and future directions in combating misinformation.

[Read more](#)



## Critical Review of Cybersecurity Risks in Precision Agriculture

Shubham Kumar & Mohammad Faisal

(IEEE Xplore, 2025)

Precision agriculture integrates IoT, machine learning, and artificial intelligence to enhance real-time monitoring and predictive analytics in farming systems. This paper explores the transformative potential of PA in improving productivity and sustainability. It highlights associated cybersecurity, financial, and technological risks. The study reviews current PA practices, identifies key threats, and evaluates security-focused research, emphasizing data integrity, privacy protection, and the need for robust defense mechanisms in agricultural systems.



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## An Approach to Detect The Nitrogen Deficiency of Paddy Crop On Agriculture Farm Using Digital Image Processing

Mohammad Arif Mi Usmani & Ausaf Ahmad

(Advances in Science, Engineering and Technology, 2025)

Leaf Color Chart (LCC), Decision Intelligence Platform (DIP), and Machine Learning (ML), supports real-time nitrogen management in rice farming for optimal fertilizer use. This paper explores the use of LCC technology to guide nitrogen application in rice cultivation based on leaf color intensity, which reflects chlorophyll and nutrient levels. Validated through participatory research in West Bengal, India, the study analyses LCC adoption and its impact using DIP and ML tools. Results show improved nitrogen efficiency, reduced costs, and minimized environmental harm.



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## Improving Anti-Tumour Immunity by Combining Brain Immunology And Immunotherapy In Brain Tumours

Saumya Singh, Sumit Yadav, Motashim Rasool,  
Uvais Ahmad & Fiza Afreen, Fareen

(Advances in Science, Engineering and Technology, 2025)

A combination of immunotherapeutic approaches is being employed to strengthen anti-tumour responses against brain tumours. This paper highlights the advancement of combination immunotherapy strategies aimed at overcoming the immunosuppressive environment of brain tumours. It discusses how integrating immune checkpoint inhibitors, adoptive cell therapies, cancer vaccines, and targeted agents can enhance immune activation. The paper evaluates findings from preclinical and clinical studies, emphasizing challenges such as toxicity, patient heterogeneity, and limited monotherapy effectiveness, while outlining prospects for more effective, sustained treatments.

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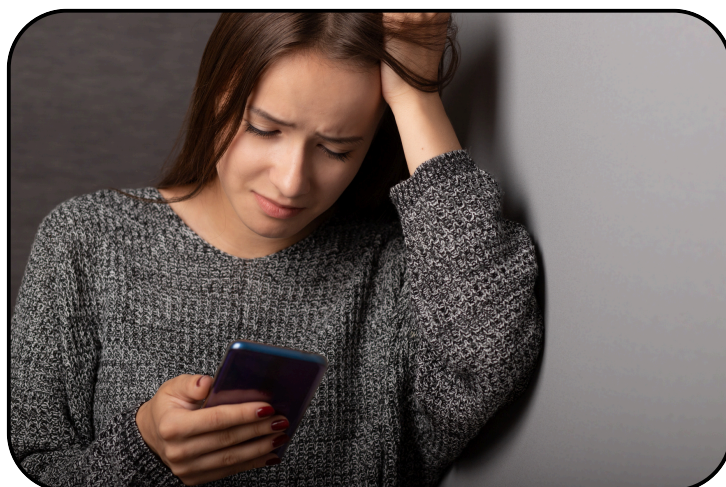
## Cyberbullying-Understanding, Preventing, and Addressing Online Harassment

Syed Adnan Afaq, Mohammad Faisal, Tasneem Ahmed & Gausiya Yasmeen

(Cyberology -An Optimized Approach to the Cyber-World, 2025)

Social media and electronic communication technologies are central to understanding the rise and spread of cyberbullying. This chapter explores how digital platforms facilitate harmful behaviors such as cyberstalking, doxxing, and impersonation. It examines the psychological and social impact on victims and perpetrators, the role of anonymity and the disinhibition effect, and how real-world conflicts migrate online. The study emphasizes the urgent need for preventive strategies and interventions in the digital space.

[Read more](#)



## Cybersecurity Challenges and Countermeasures in Smart Cities for Sustainable Environment Development: A Comprehensive Analysis of Threats and Resilience Strategies

Tasneem Ahmed, Syed Adnan Afaq & Mohammad Faisal

(Cyberology -An Optimized Approach to the Cyber-World, 2025)

Smartphones integrated with IoT resources like Wi-Fi, sensors, and internet connectivity play a vital role in delivering services such as intelligent transportation, automated traffic control, and digital healthcare in smart cities. This approach helps lower implementation costs but raises concerns about personal data vulnerability. The paper highlights how smart city initiatives intersect with urban resilience, exploring both benefits and risks associated with mobile-based smart solutions.



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## An Approach to Estimate The Instability, Growth Rate And Decomposition Analysis of Mango Crop Productivity Through Landsat-8 Satellite Images

Tasneem Ahmed et al.

(Advances in Science, Engineering and Technology, 2025)

Landsat-8 satellite imagery combined with a knowledge-based Decision Tree Classifier (DTC) is employed to estimate mango crop area, production, and productivity in Lucknow and Meerut districts of Uttar Pradesh from 2013–14 to 2020–21. Analysis using compound growth rate, decomposition, and coefficient of variance shows that increasing the mango cultivation area significantly boosts productivity, offering valuable insights for agricultural planning and policy development.



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## Role of Image Processing And Machine Learning Techniques In Detection of Crop Stress And Crop Diseases

Gausiya Yasmeen, Nidhi Pandey & Tasneem Ahmed

(Advances in Science, Engineering and Technology, 2025)

Image processing and machine learning techniques are utilized to monitor agricultural water stress by analyzing satellite-derived indicators such as relative water content, evapotranspiration, and chlorophyll levels. These methods classify crops based on color, texture, and damage parameters, enabling timely drought detection and disease management. The study highlights the efficiency, affordability, and precision of such tools, and suggests pathways for future research in water stress analytics.



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## A Comprehensive Review: Anomaly Detection Techniques on Social Networking And Its Applications

Sarfaraz Alam & Mohammad Faisal

(Advances in Science, Engineering and Technology, 2025)

Anomaly detection techniques are employed to identify irregular user behavior in online social networks by analyzing hidden patterns in user interactions. These methods are crucial for uncovering malicious activities, as user behaviors often deviate from normal patterns. The study presents a comprehensive taxonomy of detection methods based on anomaly types, network characteristics, and detection models, while addressing challenges and outlining diverse application areas such as cybersecurity, healthcare, and education.



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## Data Mining Techniques for Type 2 Diabetes Prediction: A Literature Review

Rizwan Akhtar & Muhammad Kalamuddin Ahamad

(Advances in Science, Engineering and Technology, 2025)

Data mining techniques such as decision trees, support vector machines, neural networks, and random forests are applied to predict and manage Type 2 Diabetes Mellitus (T2DM). These models enable early diagnosis through analysis of large-scale health datasets. The study evaluates each method's accuracy, interpretability, and scalability, while highlighting challenges like feature selection and overfitting, with future directions pointing toward explainable AI and deep learning integration.

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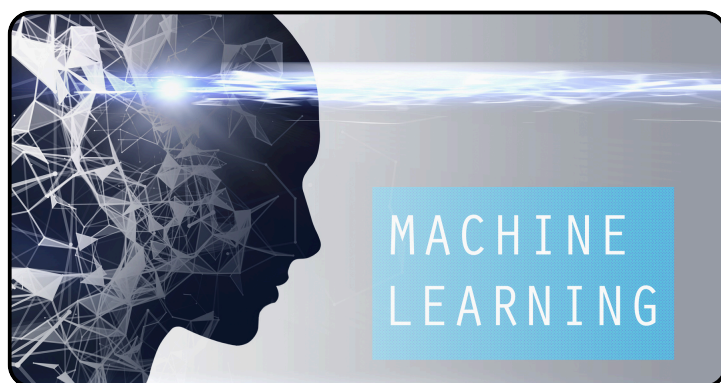
## A Survey of Sentiment Analysis and Opinion Mining Using Supervised Machine Learning

Nadiya Parveen, Mohd Waris Khan & Fiza Afreen

(Advances in Science, Engineering and Technology, 2025)

Supervised machine learning techniques like Naive Bayes, Support Vector Machines (SVM), and Logistic Regression are leveraged for sentiment analysis and opinion mining across social media, reviews, and news content. The study compares multiple classifiers and highlights Logistic Regression as the most robust, with Linear SVM showing consistent accuracy gains with larger datasets. These findings guide optimal model selection for effective sentiment categorization in diverse applications.

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## A Comprehensive Assessment of The Existing Literatures on The Challenges And Solutions Related To Cyber Security In Smart Cities

**Rizwan Ahmed Khan, Mohd Faizan Farooqui & Mohd Waris Khan**

**(Advances in Science, Engineering and Technology, 2025)**

Internet of Things (IoT) and Information and Communication Technologies (ICT) are key enablers in smart cities, optimizing services like energy, transport, healthcare, and waste management. This study investigates cybersecurity vulnerabilities arising from these technologies, highlighting risks such as digital attacks on smart infrastructure. It proposes a comprehensive research framework to address security challenges and guide future strategies for safeguarding smart city ecosystems.

[Read more](#)



## Cyber-Aggression: A Comprehensive Study on Cyberbullying Recognition And Intervention In Social Media Context

**Tasneem Ahmed & Mohammad Faisal**

**(Advances in Science, Engineering and Technology, 2025)**

Social media platforms, driven by digital communication technologies, are central to the spread and detection of cyberbullying, especially among youth. This study explores cyberbullying through forms like harassment, impersonation, and defamation, while analyzing contributing factors such as anonymity and disinhibition. It emphasizes a multidisciplinary approach—integrating psychology, technology, and policy—for effective recognition, prevention, and intervention strategies to combat cyber aggression in online environments.

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## Precision In Tracking: The Role of RFID In Asset Visibility

Farha Zia & Shweta Dwivedi

(Advances in Science, Engineering and Technology, 2025)

RFID technology enables automated, real-time asset tracking using radio waves without requiring line-of-sight, outperforming traditional barcodes. It streamlines inventory accuracy, enhances analytics integration, and improves supply chain responsiveness. Despite challenges like cost and interoperability, advancements in tag design, security, and functionality have broadened its applicability. Case studies across healthcare, retail, and manufacturing highlight RFID's impact on operational efficiency, resource management, and competitive market performance.



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## Prediction of Alzheimer's Disease Using Data Mining Techniques: A Comprehensive Review

Shameem Ahmad Ansari & Muhammad Kalamuddin Ahmad

(Advances in Science, Engineering and Technology, 2025)

Deep learning and machine learning models have emerged as effective tools for early detection of Alzheimer's Disease (AD), a progressive neurodegenerative disorder marked by memory loss and cognitive decline. Recent advancements in neural network architectures and data augmentation have enhanced diagnostic accuracy. This review explores diverse datasets, model designs, evaluation metrics, and reproducibility strategies to guide researchers in replicating and improving AD detection systems.



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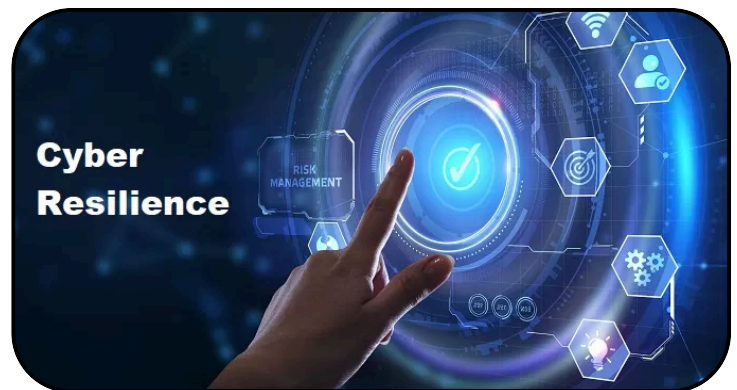
## Strategies for Cyber-Resilience: Combatting Advanced Persistent Threats in The Digital Age

Muhammad Kalamuddin Ahmad et al.

(Cyberology -An Optimized Approach to the Cyber-World, 2025)

Advanced detection technologies, threat intelligence, and cybersecurity frameworks are essential to counter sophisticated cybercrimes, including zero-day exploits and Advanced Persistent Threats (APTs). These threats bypass traditional defenses through prolonged, targeted attacks, often motivated by political or corporate agendas. Emphasizing cyber-resilience through incident response plans, system segmentation, and personnel training is critical for organizations to anticipate, withstand, and recover from complex and evolving cyber threats.

[Read more](#)



## Smart Healthcare Systems Using Computer Vision and IoE

Shweta Dwivedi, Farooq Ahamad, Soumya Singh, Syed Adnan Afaq & Vishal Agarwal

(Computer Vision and Internet of Everything (IoE) for Societal Needs, 2025)

Computer Vision and IoE integration in smart healthcare systems enables intelligent diagnostics, real-time monitoring, and personalized treatment by combining visual data interpretation with interconnected devices, people, and processes. This synergy enhances patient management and medical decision-making. The review identifies key applications, technological challenges, and emerging trends, emphasizing the potential of this convergence to drive innovation and efficiency in next-generation healthcare services.

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## Study of an Innovative Approach to IoT Based Human Activity Recognition

**Motashim Rasool, Rizwan Akhtar & Uvais Ahmad**

**(Leading the Charge: A Guide to Management, Entrepreneurship and Technology in the Dynamic Business Landscape, 2025)**

IoT-based Human Activity Recognition (HAR) integrates smartphone sensors like accelerometers and gyroscopes with a neural network enhanced by short-term memory to classify transitional and non-transitional movements. The system addresses gaps in recognizing complex activities and managing noisy training data. Experimental validation confirms its superior accuracy and resilience over conventional classifiers, making it suitable for smart surveillance, healthcare, and context-aware IoT applications.

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## A Study of Cyber Threats and Security Frameworks in Cloud Computing

**Kashif Asad & Mohd. Faizan Farooqui**

**(Cyberology -An Optimized Approach to the Cyber-World, 2025)**

Cloud computing offers scalable and cost-efficient data solutions, yet introduces critical cybersecurity challenges like data breaches, DDoS attacks, insider threats, and misconfigurations. This research analyzes these risks and evaluates security frameworks including encryption, access control, and monitoring tools. Drawing from academic and industry sources, the study proposes actionable strategies to enhance protection and ensure secure, resilient cloud infrastructure in the face of evolving threats.

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## A Comprehensive Analysis of Vulnerabilities and Cybersecurity Issues for Digital Agriculture and Food Industry

Gausiya Yasmeen & Syed Adnan Afaq

(Cyberology -An Optimized Approach to the Cyber-World, 2025)

IoT-enabled smart agriculture enhances crop monitoring, soil analysis, and automation, transforming traditional farming into efficient, data-driven systems. However, this digital shift introduces significant cybersecurity risks, particularly ransomware attacks targeting food supply chains. The chapter investigates the vulnerabilities in IoT-based agricultural systems, their economic implications—such as rising food inflation—and proposes strategies to safeguard data confidentiality and resilience within the agri-tech ecosystem.

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## Transitioning from Industry 4.0 to Industry 5.0: Exploring the Potential and Implications

Satish Kumar & Vishal Agarwal

(Advances in Science, Engineering and Technology, 2025)

IoT, cloud computing, edge computing, big data analytics, and 5G technologies drive Industry 5.0, promoting a human-centric, sustainable, and resilient industrial ecosystem. This paper explores how intelligent collaboration between humans and machines in smart factories addresses limitations of Industry 4.0. It reviews key enabling technologies, identifies current challenges, and emphasizes Industry 5.0's potential to harmonize economic growth with environmental responsibility.

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## Towards Sustainable Futures: AI Framework for ESG Performance Enhancement

Tasneem Ahmed et al.

(Advances in Science, Engineering and Technology, 2025)

Artificial Intelligence (AI) enhances ESG performance by enabling data integration, predictive analytics, and decision support systems. This paper proposes an AI-driven framework to address ESG challenges such as complex data, regulatory compliance, and stakeholder engagement. By reviewing literature and case studies, it outlines the benefits, limitations, and ethical concerns of AI in ESG strategy, offering a proactive approach toward achieving sustainability goals.



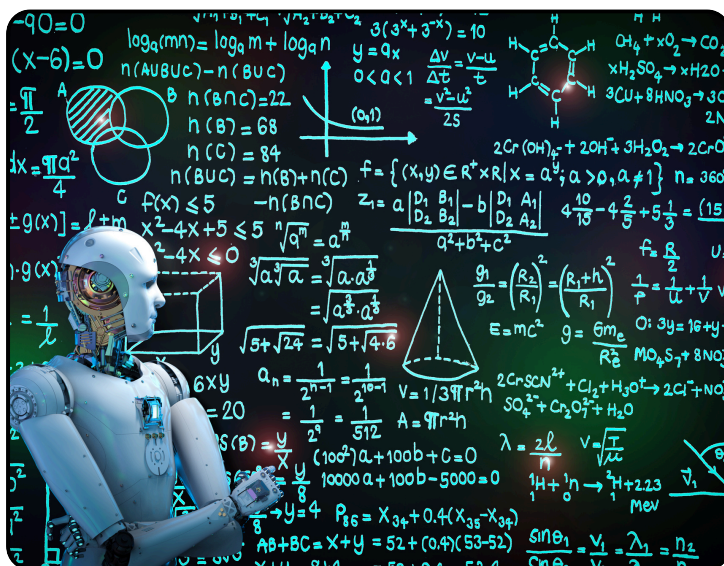
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## Leveraging Machine Learning for Emerging Trends in Information Technology

Shweta Dwivedi & Syed Adnan Afaq

(Advances in Science, Engineering and Technology, 2025)

Machine Learning (ML) plays a pivotal role in shaping emerging IT trends such as cybersecurity, edge computing, IoT, cloud computing, and quantum computing. This review analyzes recent research and case studies highlighting how ML algorithms enhance security, efficiency, and innovation across these domains. It also discusses implications for industry, academia, and policy, while identifying future directions and research gaps in ML-driven IT evolution.



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## Improving the hardware Security of Wireless Sensor Network System by Using Analytic Hierarchy Process

Mohd Waris Khan, Satish Kumar, Mohd Faizan & Mohd Faisal

(Advancements in Artificial Intelligence and Machine Learning, 2025)

Analytic Hierarchy Process (AHP) is applied to evaluate and enhance hardware security in wireless sensor networks (WSNs). The study proposes a structured framework for assessing vulnerabilities and prioritizing solutions. Hardware encryption ranks highest with a score of 0.555, indicating it as the most effective security measure. The AHP-based approach enables systematic decision-making and prioritization of security enhancements in WSN systems.



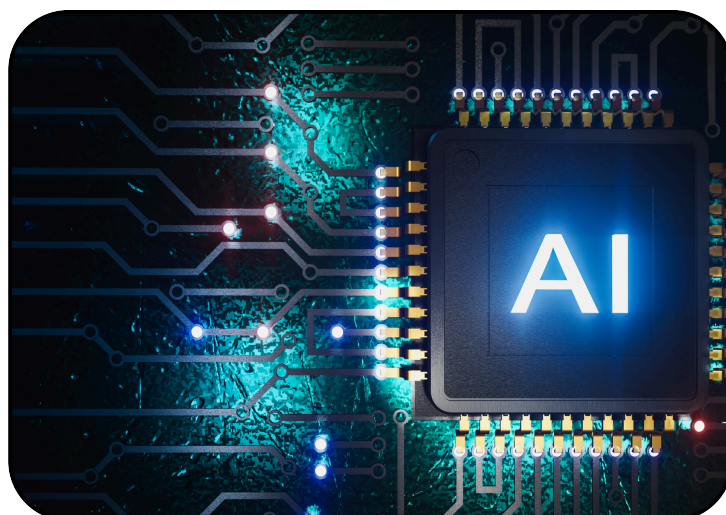
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## Advancing Green Artificial Intelligence: Strategies for a Sustainable Future

Farooq Ahmad & Shweta Dwivedi

(Energy Efficient Algorithms and Green Data Centers for Sustainable Computing, 2025)

Green AI promotes environmentally sustainable machine learning by reducing computational costs and energy use while maintaining high performance. The chapter examines green-by-AI approaches for eco-friendly applications and green-in-AI methods for designing energy-efficient models. It also highlights tools for energy optimization, regulatory support, and future pathways to embed sustainability in AI development, making advanced research feasible even on low-resource devices.



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# Empowering Smart Education Through Computer Vision and Internet of Everything in School Transportation

**Farooq Ahmad & Shweta Dwivedi**

(Computer Vision and Internet of Everything (IoE) for Societal Needs, 2025)

Computer vision and IoE are integrated in a smart school transportation system that enhances student safety and operational efficiency in smart towns. Using facial recognition, object detection, and IoT-enabled connectivity, the system enables real-time monitoring and communication across vehicles, surveillance units, and control centers. Applied in Kota Baru Parahyangan City, it improves safety, traffic flow, and resource management through stakeholder-informed design.



## Read more

# Enhancing Fuzzy Multi Criteria Decision Making Technique in Engineering Design Problem

**Syed Adnan Afaq, Shweta Dwivedi & Mohammad Faisal**

(Applications of Fuzzy Logic in Decision Making and Management Science, 2025)

Fuzzy logic enhances multicriteria decision-making (MCDM) by accommodating ambiguity and uncertainty through fuzzy sets and membership functions. By applying methods like fuzzy aggregation operators and fuzzy multi-attribute utility theory, this study enables nuanced evaluation of alternatives under uncertain conditions. Used across domains such as healthcare, engineering, and environmental management, fuzzy logic improves decision robustness and flexibility by effectively processing subjective and imprecise inputs.



## Read more



## Improving Diabetic Patient Care Through Fuzzy Logic: A Comprehensive Approach

Shweta Dwivedi, Syed Adnan Afaq & Mohammad Faisal

(Applications of Fuzzy Logic in Decision Making and Management Science, 2025)

Fuzzy logic offers an effective approach for managing the uncertainty and complexity in diabetes care. Integrating this technique with patient-specific data, this study proposes a comprehensive framework for diabetic patient management, including risk assessment, treatment optimization, and personalized lifestyle support. Through fuzzy rule-based systems, clustering, and adaptive inference mechanisms, the framework enhances clinical decision-making and patient outcomes, demonstrating strong potential in both simulation and real-world healthcare settings.

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## A comprehensive overview of digital image processing techniques in precision agriculture

Gausiya Yasmeen & Tasneem Ahmed

(Advances in Science, Engineering and Technology, 2025)

Digital image processing enables efficient crop monitoring in Precision Agriculture (PA), which integrates GIS, satellite navigation, and RPAS-drone imagery to support sustainable farming. Centered on this study is a comparative analysis of satellite and drone-based monitoring, highlighting the superior precision of RPAS for detecting weeds, diseases, and nutrient issues. The review identifies future research potential in photogrammetry, vegetation indices, and crop-specific monitoring using image-driven PA tools.

[Read more](#)



## Sustainable Planet - Leveraging Artificial Intelligence for Environmental Conservation And Social Well-Being

Satish Kumar & Shubham Kumar

(Advances in Science, Engineering and Technology, 2025)

Artificial Intelligence (AI) offers transformative potential for addressing environmental challenges, including climate change, waste management, and resource conservation. Centered on this study is a comprehensive analysis of AI-driven sustainability applications across sectors, demonstrating how intelligent systems can enable real-time monitoring, predictive analytics, and optimized decision-making. The findings highlight the need for collaborative implementation involving governments, industries, and academia to ensure AI is harnessed responsibly for a resilient and sustainable future.

[Read more](#)

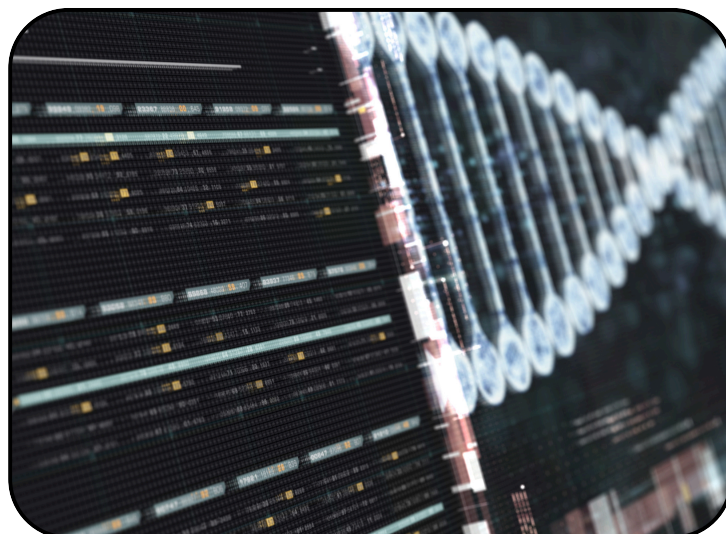
## Data-Driven Approach of Species DNA Sequencing Based on Similar Patterns Using Machine Learning

Bably Dolly et al.

(Computational Intelligence and its Applications, 2025)

Machine learning techniques, particularly the Naïve Bayes algorithm, are applied in this study to analyze genome sequencing data and identify evolutionary relationships among species. The research focuses on DNA sequence similarity between humans, chimpanzees, and dogs, with results showing a 99.30% and 98.40% similarity between humans and chimpanzees—confirming their evolutionary closeness. This study opens pathways for deeper genomic comparisons to understand inherited traits and ancestral lineage in life sciences.

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## Hybrid Evolutionary Algorithms and Fuzzy Sets for Optimization in Healthcare Decision Support Systems

Shweta Dwivedi, Saumya Singh, Vishal Agarwal, Rizwan Akhtar,  
Syed Adnan Afaq

(International Journal of Research Publication and Reviews, 2025)

Hybrid Evolutionary Algorithms (HEA) combined with Fuzzy Sets are utilized in this study to optimize decision-making in Healthcare Decision Support Systems (HDSS). By addressing uncertainty in medical data and enhancing prediction accuracy through evolutionary optimization, this study develops a framework focused on feature selection and fuzzy rule generation. Evaluation on healthcare datasets shows improved accuracy, precision, and reliability, underscoring the hybrid model's potential for robust clinical decision support.



[Read more](#)

## A Transfer Learning Based Model for Brain Tumor Detection Using Magnetic Resonance Imaging

Tasneem Ahmed et al.

(AIP Conference Proceedings, 2025)

Deep learning (DL) with transfer learning is employed in this study to develop an automated system for brain tumor classification using MRI data. By categorizing tumors into four types, including Glioma, Meningioma, and Pituitary, the model aids in early detection and treatment planning. This DL-based approach enhances diagnostic accuracy, especially for high-risk tumor types, improving patient survival chances through timely intervention.



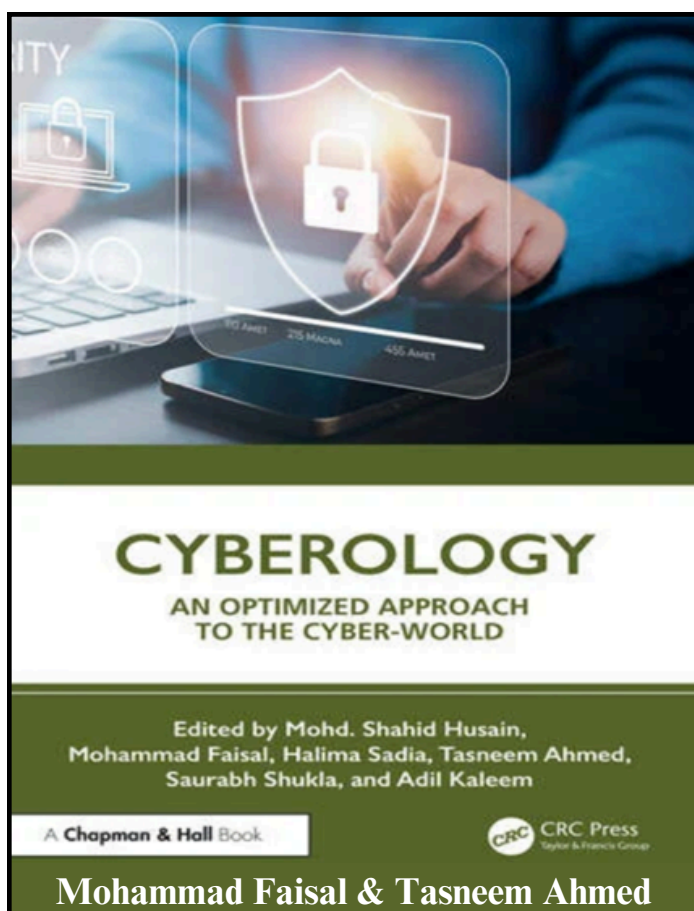
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## Books

### Cyberology: An Optimized Approach to the Cyber-World

ISBN : 9781032526683

CRC Press



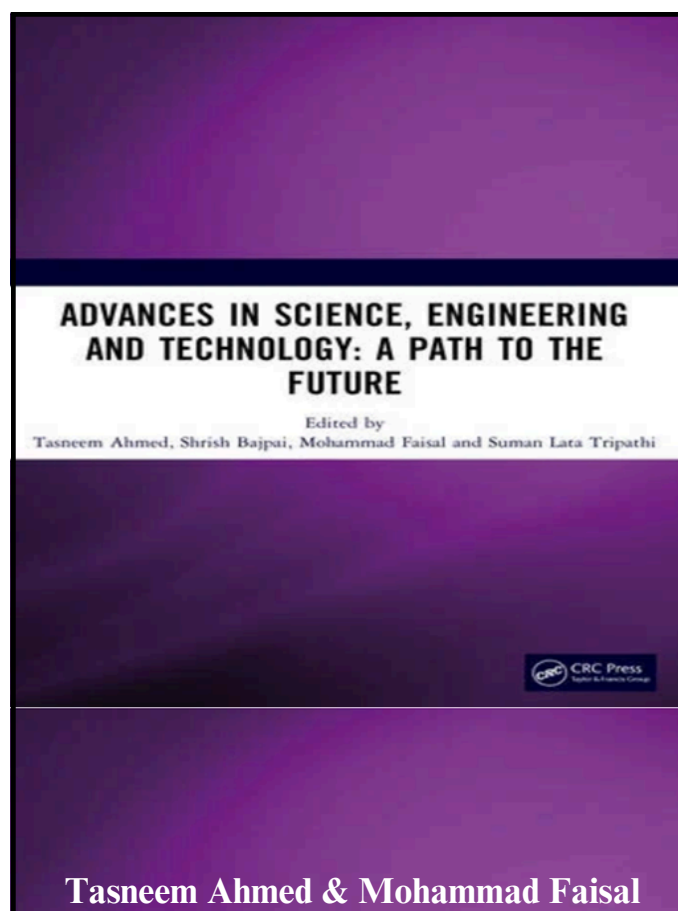
Cybersecurity technologies and threat analysis tools form the core of this book, which offers a comprehensive overview of digital security challenges across critical domains like healthcare, agriculture, and government. This study presents foundational principles of cybersecurity, emphasizing the human-technology interface. It addresses cyber threats, cyberbullying, cloud vulnerabilities, and persistent threats while highlighting the importance of cyber resilience and current trends in cyber warfare. It serves as a crucial reference for understanding the evolving digital threat landscape.

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### Advances in Science, Engineering and Technology: A Path to the Future

ISBN : 9781041076483

CRC Press



Quantum computing, video analytics, Artificial Intelligence (AI), and Machine Learning (ML) are central themes in this book, which aims to bring together insights from academicians and industry professionals across science, engineering, and IT. This study highlights how the content fosters knowledge sharing and ideation around transformative technologies. Special emphasis is placed on ML, showcasing its pivotal role in shaping the future of scientific research and industrial innovation.

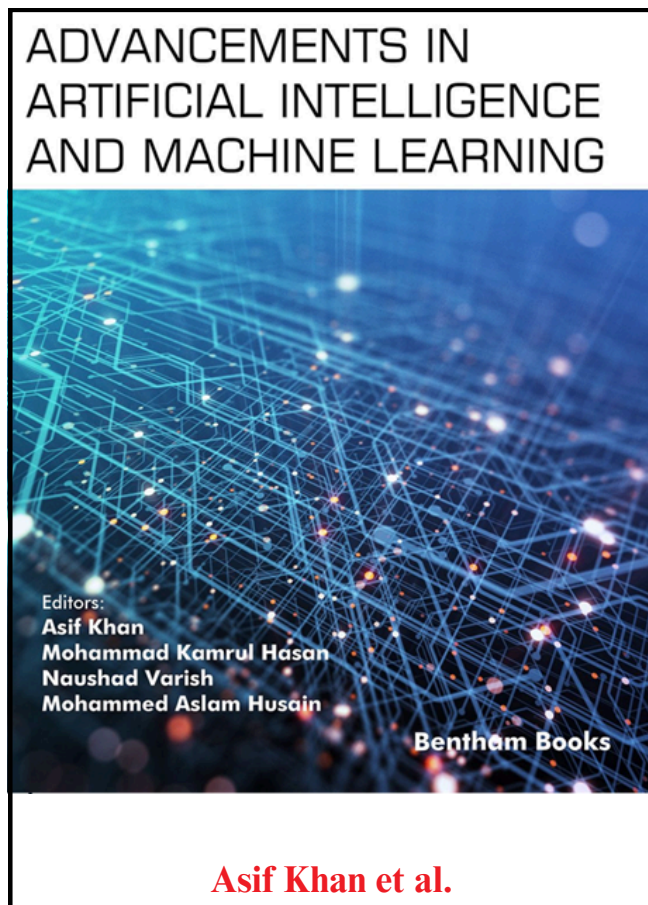
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## Advancements in Artificial Intelligence and Machine Learning

ISBN: 978-981-5322-59-0

Bentham Science Publishers



**Asif Khan et al.**

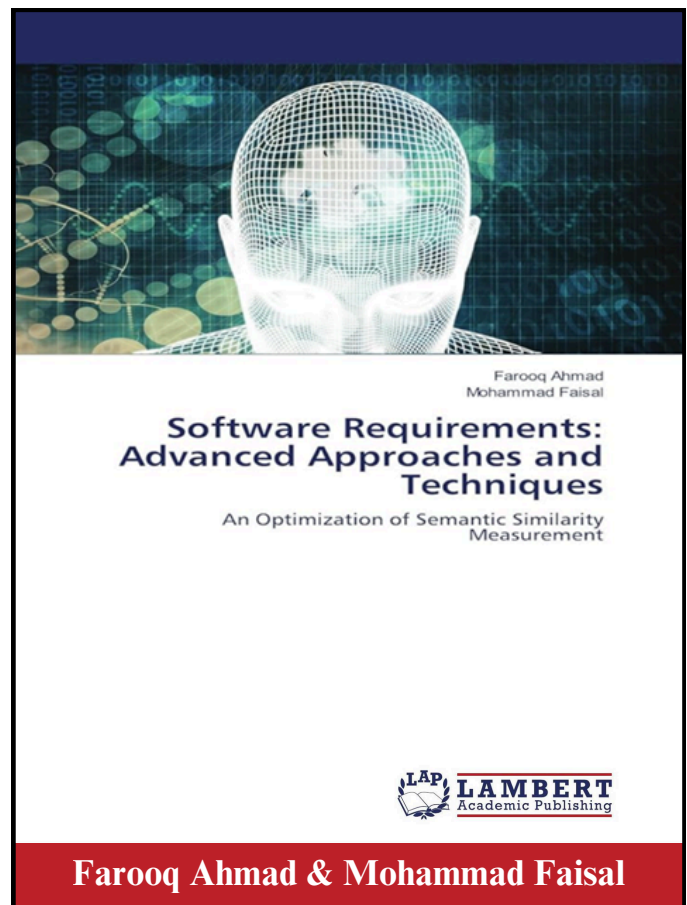
Artificial Intelligence (AI) and Machine Learning (ML) form the core of this book, which offers a multidisciplinary exploration of emerging applications across robotics, cybersecurity, healthcare, and digital transformation. This study presents twelve chapters addressing AI's impact—from mechatronics and smart grids to transformer health, sentiment analysis, crime prevention, and brain tumor detection—highlighting AI/ML's growing versatility. It emphasizes real-world implementations, contemporary challenges, and practical solutions in intelligent, data-driven systems.

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## Software requirements: Advanced approaches and techniques (An Optimization of Semantic Similarity Measurement)

ISBN: 978-620-8-42141-0

Lambert Academic Publishing



**Farooq Ahmad & Mohammad Faisal**

Natural Language Processing (NLP) and machine learning techniques are central to this book, which focuses on enhancing semantic similarity measurement in software requirements. This study introduces a novel hybrid approach that merges knowledge-based and corpus-based methods, incorporating lexical databases, word embeddings, corpus statistics, and implicit word order. The framework aims to improve requirement interpretation, reusability, and clarity—ultimately leading to more efficient software design and stakeholder communication.

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## Earth Insight Revolution: Advanced Satellite Imaging and Big Data Analytics for Modern Land Surface Monitoring

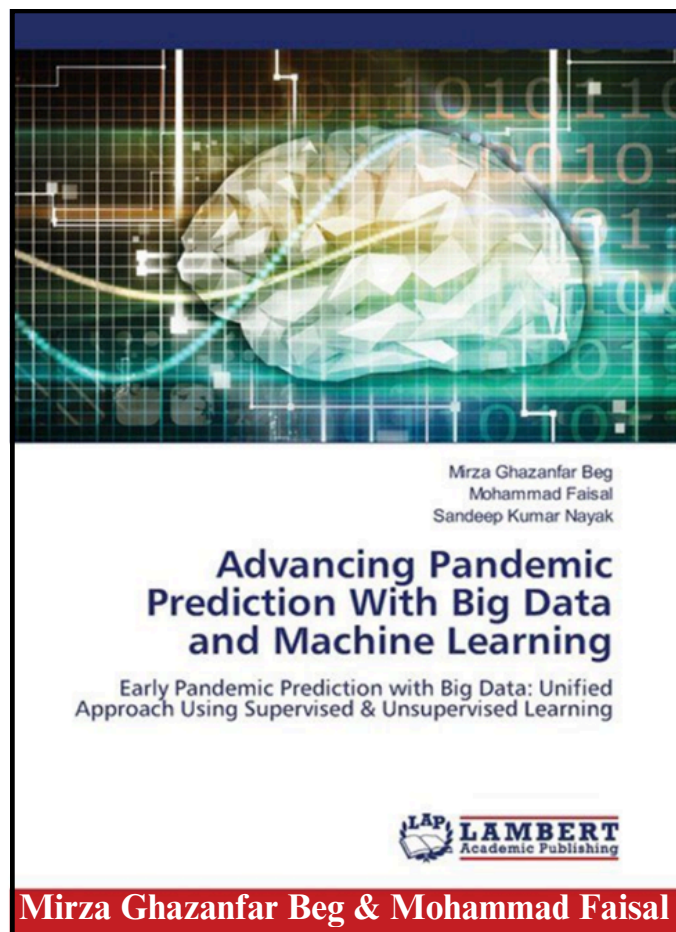
**ISBN: 978-620-8-43694-0**

**Lambert Academic Publishing**

## Advancing Pandemic Prediction With Big Data and Machine Learning

**ISBN: 978-620-8-42055-0**

**Lambert Academic Publishing**



Satellite imagery and big data analytics are redefining environmental monitoring, as highlighted in the book *Earth Insight Revolution*. This study showcases advanced techniques like Feature Based Image Retrieval (FBIR), deep learning, and change detection to assess urban development and climate change using Landsat-8 and Sentinel-2 data. The book offers practical insights for researchers, students, and professionals aiming to leverage satellite technology for sustainable land surface monitoring.

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Big data analytics forms the foundation of this book, which introduces a hybrid prediction technique integrating both unsupervised and supervised learning methods. This study highlights the technique's effectiveness in handling complex, high-volume datasets and its applicability across multiple domains. The research emphasizes its potential to extract patterns, make accurate predictions, and support data-driven decisions—advancing practical implementation and encouraging future exploration to refine predictive capabilities in big data environments.

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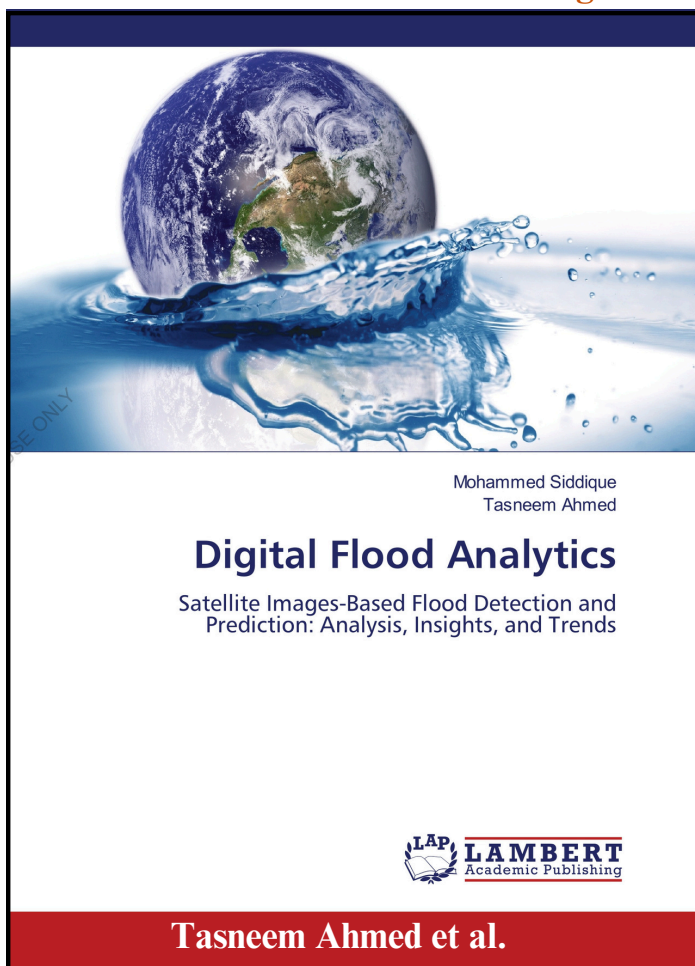


## Digital Flood Analytics: Satellite Images-Based Flood Detection and Prediction:

Analysis, Insights, and Trends

ISBN: 978-620-8-44417-4

Lambert Academic Publishing



This work presents SBBASSA, a Spark-based hybrid binary Bat (BBA) and binary Salp Swarm Algorithm (BSSA) for feature selection and classification of crisis-related tweets. By combining BBA and BSSA, the approach enhances exploration capabilities, while Apache Spark ensures reduced execution time. A support vector machine (SVM) classifier is used for wrapper-based feature selection and classification. Tested on six crisis tweet datasets, including Hurricane Sandy and Boston Bombings, SBBASSA outperformed BSSA, BBA, and BPSO, achieving the highest accuracy with fewer features and lower computational costs, making it an efficient solution for crisis tweet classification.

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## Patents

Indian Patent

AI Enhanced Cloud Security  
Dashboard Device

Dr. Farooq Ahmad, Dr. Shweta Dwivedi,  
Dr. Bably Dolly

17 December 2024

IP No: 440975-001

Indian Patent

Method and System for Dynamic IoT  
Network Configuration Using Machine  
Learning Algorithms

Dr Shweta Dwivedi, Dr. Mohammad Faisal

24 January 2025

IP No: 202531003583

Indian Patent

Data Processing Device for 5G  
Communication

Dr Asif Khan, Dr. Mohd Faizan, Dr.  
Ausaf Ahmad, Mr. Safikur Rahman Khan,  
Dr. Tabrez Khan, Dr. Mohd. Waris Khan

09 November 2024

IP No: 436861-001

Indian Patent

Advanced Machine Learning Techniques for  
Predicting T20 Cricket Match Winners

Dr. Kashif Asad, Dr. Abida Khanam

25 April 2025

IP No: 202511035852 A

Indian Patent

Unified Predictive Epidemic Model:  
Integrating Unsupervised and  
Supervised Learning Methods

M. G. Beg, S. K. Nayak, S. A. Afaq,  
M. W. Khan, Dr. Mohammad Faisal

20 June 2025

IP No: 202511053892 A



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# BEST INNOVATOR AWARD



**Dr. Asif Khan**

Assistant Professor

Department of Computer Application

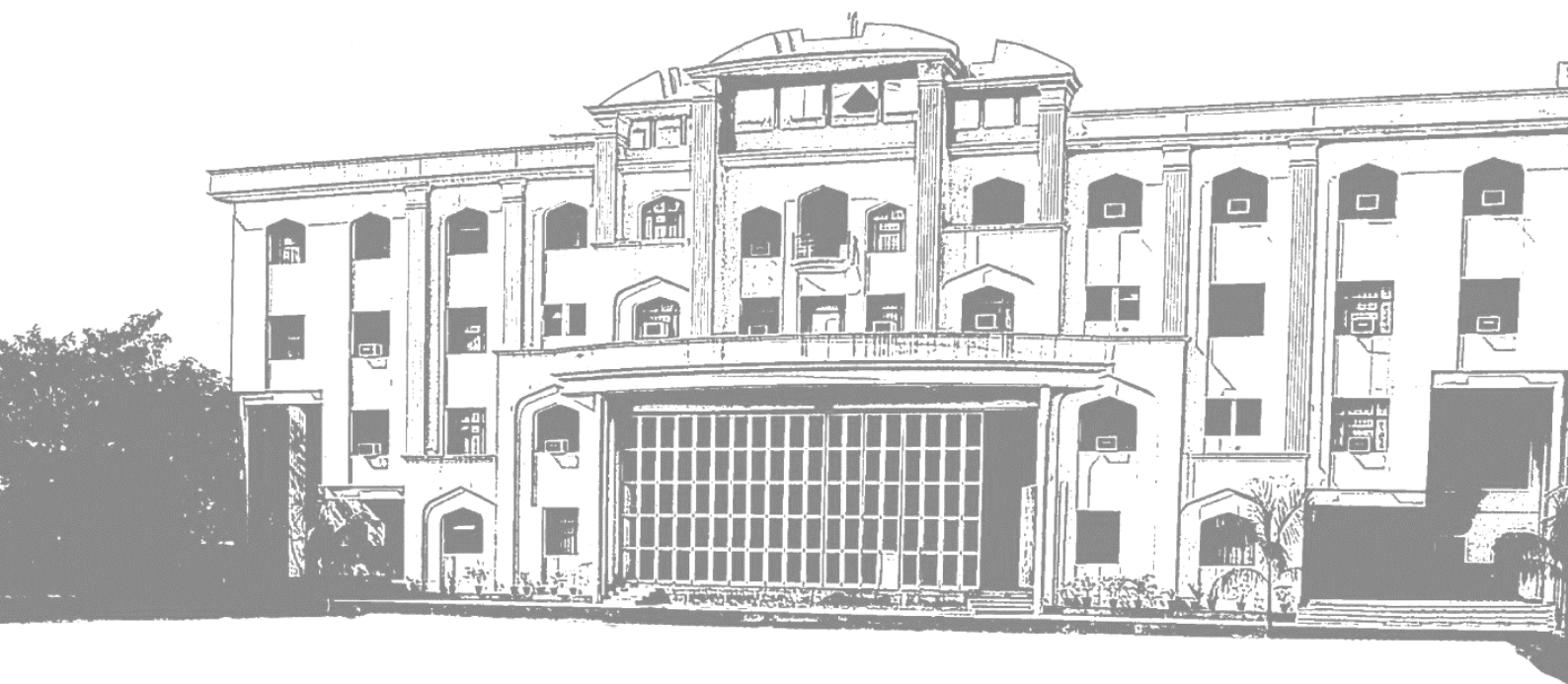
Your hard work, dedication, and positive attitude have truly made a difference. Thank you for going above and beyond every day. We're proud to have you on our team and look forward to seeing your continued success!



## About Integral University

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Integral University, a seat of educational excellence, is a premier university located in Lucknow, the capital city of Uttar Pradesh, India. The university is duly approved by the University Grants Commission (UGC) under Sections 2(f) and 12B of the UGC Act, 1956. It is also approved by the National Medical Commission, Pharmacy Council of India, Indian Nursing Council, Council of Architecture, Bar Council of India, Indian Association of Physiotherapists, National Council for Teacher Education, and UP State Medical Faculty. Integral University is accredited with an A+ grade by the National Assessment and Accreditation Council (NAAC) and recognized as a Scientific & Industrial Research Organization (SIRO) by the Department of Scientific & Industrial Research, Ministry of Science & Technology, Government of India. Integral Hospital is accredited by the National Accreditation Board for Hospitals & Healthcare Providers (NABH), the laboratories are accredited by the National Accreditation Board for Testing and Calibration Laboratories (NABL), and the agriculture program is accredited by the Indian Council of Agricultural Research (ICAR), Government of India.



# About the Department of Computer Application

The Department of Computer Application at Integral University is dedicated to providing high-quality education, research, and innovation in the field of computing and information technology. The department offers a range of programs, including BCA, MCA, and Ph.D., designed to equip students with cutting-edge knowledge in areas such as artificial intelligence, data science, cybersecurity, software development, and cloud computing. With a team of experienced faculty members, state-of-the-art laboratories, and a research-driven environment, the department emphasizes both theoretical knowledge and practical application. Through industry collaborations, workshops, and hands-on projects, students are prepared to meet the evolving demands of the IT sector. The department strives to cultivate a culture of innovation and lifelong learning, empowering students to excel in academia, industry, and entrepreneurship while contributing to technological advancements for a better future.

**Compiled By**  
**Dr. Virendra Singh &**  
**Dr. Mohd Waris Khan**

**Designed By**  
**Mr. Shahnawaz**

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