



SCHOLARLY PUBLICATIONS

School of Computer Engineering

KIIT Deemed to be University

Journal Name: Technology in Society

IF: 10.1

Title: Adverse impacts of metaverse-induced cognitive biases on the immersive shopping experience: A conceptual model developed from a qualitative approach

Author: Ghosh S.; Behera R.K.; Bala P.K.; Rana N.P.

Details: Volume 82, September 2025, 102916, Article

Abstract: Immersive shopping (IS) is the usage of simulation-based technology like metaverse to create interactive and highly personalised shopping experiences for customers wherein they spend quality time selecting the products, which increases their familiarity with the brand. When compared to a standard shopping experience, the IS experience (ISE) offers brick-and-mortar retailers a positive brand image. However, the metaverse can induce cognitive biases (CBs) in customers that can negatively influence their reasoning and decision-making. CB is the systematic error in thinking that occurs when people are processing and interpreting information during the shopping, which affects their decisions and judgments. Therefore, this study explores the adverse impacts of metaverse-induced CBs on ISE for brick-and-mortar retail customers. Using simple random sampling, data were collected from 20 customers, and a qualitative approach was used for data analysis. The finding produces three adverse impacts for ISE. First, metaverse-induced CBs create a digital divide between customer communities, and the integration of retail services with the metaverse further aggravates the risk of this divide. Second, metaverse-induced CBs create financial malfeasance, which makes the metaverse susceptible to financial biases. Third, metaverse-induced CBs increase business reputation risk by adversely impacting decision-making, strategy formulations, and outcomes.



URL: <https://www.sciencedirect.com/science/article/pii/S0160791X2500106X?via%3Dihub>





SCHOLARLY PUBLICATIONS

School of Computer Engineering

KIIT Deemed to be University

Journal Name: IEEE Internet of Things Journal

IF: 8.2

Title: Protecting IoT-Enabled Healthcare Data at the Edge: Integrating Blockchain, AES, and Off-Chain Decentralized Storage

Author: Mohanta B.K.; Awad A.I.; Dehury M.K.; Mohapatra H.; Khan M.K.

Details: 2025

Abstract: Over the past two decades, the rapid growth of the Internet of Things (IoT) has begun to transform traditional healthcare systems into intelligent systems; however, hospitals have encountered challenges in securely storing patient data within centralized architectures due to their lack of efficiency and security features. Blockchain technology offers a secure and reliable decentralized framework for storing and sharing healthcare data among various stakeholders, including patients, doctors, nurses, insurance companies, and pharmaceutical firms. In this paper, we propose a blockchain-based data-protection scheme deployed at edge nodes. The proposed scheme uses the InterPlanetary File System (IPFS) model to address storage and data-protection issues in an IoT-edge-enabled smart health-care system. First, the security issues in smart healthcare systems are identified, and the impact of these issues on patient privacy and hospital infrastructure are considered. Then, a technique based on the 128-bit Advanced Encryption Standard is proposed to encrypt patient information and store it in an IPFS-based decentralized network.



Edge-computing techniques are used to perform computations at the edge level within a decentralized architecture, thereby addressing the computational challenges associated with cloud computing. Lastly, the encryption keys are stored using blockchain technology to address the issue of restricted computational power on low-end devices through off-chain and on-chain business processes. The experimental results demonstrate that the proposed scheme achieves a key management time of 0.2 ms, file retrieval time of 0.57 seconds, throughput of 0.11 Mbps, encryption time of 1.96 ms, and decryption time of 1.91 ms. These findings indicate that the proposed scheme outperforms previously reported approaches with respect to key management time, file retrieval efficiency, and its potential for edge deployment and off-chain capabilities.

URL: <https://ieeexplore.ieee.org/document/10839037>





SCHOLARLY PUBLICATIONS

School of Computer Engineering

KIIT Deemed to be University

Journal Name: Expert Systems with Applications

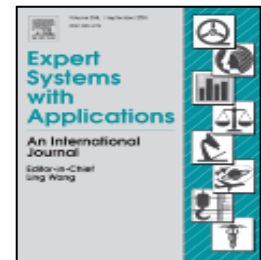
IF: 7.5

Title: Integration of EEG-based BCI technology in IoT enabled smart home environment: An in-depth comparative analysis on human-computer interaction techniques

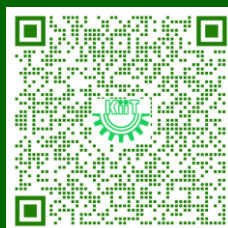
Author: Kumar Gouda S.; Choudhry A.; Satpathy S.P.; Shukla K.M.; Dash A.K.; Pasayat A.K.

Details: Volume 294, December 2025

Abstract: The advent of smart home technology has revolutionized the way individuals communicate with their living spaces, offering efficiency, convenience, and comfort. The integration of brain-computer interface (BCI) technology within smart home environments presents a promising avenue for transforming human-computer interaction (HCI) paradigms. This review paper synthesizes current research findings on optimizing smart home user interfaces through HCI utilizing electroencephalography (EEG)-based BCI technology. EEG-based BCIs offer a novel approach to interface design by directly interpreting users neural signals, thereby enabling seamless interaction with smart home devices. By using EEG signals to figure out what people are thinking and feeling, BCI creates a direct way for people and machines to communicate naturally, without using traditional input methods. The paper examines a few explicit key components such as signal acquisition, feature extraction, feature selection, classification algorithms, and system integration. Furthermore, the review evaluates the effectiveness, challenges, and future prospects of EEG-based BCIs in optimizing HCI within smart home ecosystems. Insights from this review contribute to the understanding of how it can revolutionize user interaction paradigms, leading to more intuitive, efficient, and personalized smart home environments. This work presents a comprehensive study on the proposed topic by consolidating useful information from various sources and exhibiting it in a single paper to provide quality data to the novice researchers to help them in this field of research.



URL: <https://www.sciencedirect.com/science/article/pii/S0957417425023486?via%3Dihub>





SCHOLARLY PUBLICATIONS

School of Computer Engineering

KIIT Deemed to be University

Journal Name: Computers in Biology and Medicine

IF: 6.3

Title: Beyond traditional models: Jaya-optimized ensembles for accurate heart disease prediction

Author: Prusty S.; Goud S.S.; Rautaray J.; Mishra P.; Khandpal M.

Details: Volume 196, September 2025

Abstract: Introduction: Heart Disease (HD) stands as the foremost reason for mortality all over the world for both men and women. Millions of people are affected worldwide every year, resulting in numerous fatalities. Timely and precise detection is essential for enhancing patient survival rates and potentially preventing further complications. This research method includes six major steps: (i) two different HD dataset descriptions, (ii) preprocessing of individual data, (iii) initial prediction with traditional ML models, (iv) final prediction using proposed Jaya-optimized Stack Ensemble (J-oSE) method, and (v) comparative performance evaluations using confusion matrix (cm), receiver operating characteristic (roc) curves and 10-fold cross-validation (cv) with a 95 % confidence interval, and (vi) statistical paired t-test to evaluate the significance of proposed method. The novelty found for the proposed method lies in the successful classifications of features that are more relevant to HD. Results: The proposed method at 10-fold CV with a 95 % confidence model achieved a significant accuracy of 93.55 % for the first dataset and 84.88 % for the second dataset, surpassing the outcome of other predefined methods like Voting Ensemble, XGBoost, and the baseline stacking model. Additionally, the found p-value as '1.0' for a proposed J-oSE method with Jaya optimization and '0.146' without Jaya optimization signifies that the data is perfectly distributed as normal for the first case and approximately normal for the second case, as $p > 0.05$. Conclusion: However, incorrect positive diagnoses of HD can result in unnecessary anxiety and therapy; wrong negative diagnoses can potentially be fatal. Thus, we can say that our proposed method is more reliable and robust, potentially expanding the boundaries of predictive performance.



URL: <https://www.sciencedirect.com/science/article/pii/S0010482525011102?via%3Dihub>





SCHOLARLY PUBLICATIONS

School of Computer Engineering

KIIT Deemed to be University

Journal Name: Computers in Biology and Medicine

IF: 6.3

Title: A novel speech signal feature extraction technique to detect speech impairment in children accurately

Author: Manoswini M.; Sahoo B.; Swetapadma A.

Details: Volume 195, September 2025

Abstract: Speech signal processing and extracting useful information from speech signal is necessary for speech language impairment (SLI) detection in children. Although different features has been suggested for SLI detection, there is still a scope exist for exploration of other methods. A comparative study of different techniques for feature extraction can be done to find the optimal feature extraction technique. In this work, a study has been carried out to obtain optimal feature extraction technique for SLI detection. Inputs used for SLI detection here are the speech signals recorded from children. The feature extraction techniques that has been implemented are relative spectral transform - perceptual linear prediction (RASTA), wavelet packet transform (WPT), linear predictive coding (LPC), perceptual linear prediction (PLP), Mel-Frequency cepstral coefficients (MFCC), complex quantization cepstral coefficient (CQCC), perceptual noise cepstral coefficients (PNCC). The features extracted are then given to deep learning models namely transformer, temporal convolutional networks (TCN) and TabNet for SLI detection. The result obtained has highest accuracy of 100.00 % using PNCC feature combined with TabNet method. The novelty of the method is that the PNCC features has not been suggested for SLI detection previously. The proposed method can be used for speech impairment detection and monitoring by therapist and doctors.



URL: <https://www.sciencedirect.com/science/article/pii/S0010482525010327?via%3Dihub>





SCHOLARLY PUBLICATIONS

School of Computer Engineering

KIIT Deemed to be University

Journal Name: EPJ Quantum Technology

IF: 5.8

Title: Key reconciliation protocol for quantum key distribution

Author: Sharma, N; Saxena, V; Chamola, V; Hassija, V

Details: Volume 12, Issue 1, Article no. 21, 2025

Abstract: In quantum cryptography, secret communications are delivered through a quantum channel. One of the most important breakthroughs in quantum cryptography has been the quantum key distribution (QKD). This process enables two distant parties to share secure communications based on physical laws. However, eavesdroppers can still interrupt the communication. To overcome this, we propose a different way to detect the presence of Eve through the polynomial interpolation technique. This technique also allows us for key verification. This approach prevents the receiver as well as the intruder from discovering the sender's fundamental basis. To fully utilize IBM quantum computers' quantum computing capabilities, this paper attempts to show % error against alpha (strength of eavesdropping) and the impact of noise on the success probability of the desired key bits. Furthermore, the success probability under depolarizing noise is explained for different qubit counts. In the enhanced QKD protocol, using polynomial interpolation for reconciliation shows a 50% probability of successful key generation. This is even when the noise is increased to the maximum capacity.



URL: <https://epjquantumtechnology.springeropen.com/articles/10.1140/epjqt/s40507-025-00319-4>





SCHOLARLY PUBLICATIONS

School of Computer Engineering

KIIT Deemed to be University

Journal Name: IEEE Open Journal of the Computer Society

IF: 5.7

Title: A Detailed Comparative Analysis of Automatic Neural Metrics for Machine Translation: BLEURT & BERTScore

Author: Mukherjee A.; Hassija V.; Chamola V.; Gupta K.K.

Details: Volume 6, Article2025

Abstract: Bleurt a recently introduced metric that employs Bert, a potent pre-trained language model to assess how well candidate translations compare to a reference translation in the context of machine translation outputs. While traditional metrics like Bleu rely on lexical similarities, Bleurt leverages Bert's semantic and syntactic capabilities to provide more robust evaluation through complex text representations. However, studies have shown that Bert, despite its impressive performance in natural language processing tasks can sometimes deviate from human judgment, particularly in specific syntactic and semantic scenarios. Through systematic experimental analysis at the word level, including categorization of errors such as lexical mismatches, untranslated terms, and structural inconsistencies, we investigate how Bleurt handles various translation challenges. Our study addresses three central questions: What are the strengths and weaknesses of Bleurt, how do they align with Bert's known limitations, and how does it compare with the similar automatic neural metric for machine translation, BERTScore? Using manually annotated datasets that emphasize different error types and linguistic phenomena, we find that Bleurt excels at identifying nuanced differences between sentences with high overlap, an area where BERTScore shows limitations. Our systematic experiments, provide insights for their effective application in machine translation evaluation.



URL: <https://ieeexplore.ieee.org/document/10964149>





SCHOLARLY PUBLICATIONS

School of Computer Engineering

KIIT Deemed to be University

Journal Name: Frontiers in Nutrition

IF: 5.1

Title: Artificial intelligence in personalized nutrition and food manufacturing: a comprehensive review of methods, applications, and future directions

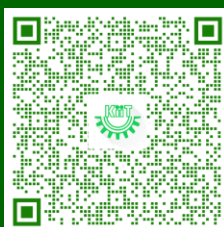
Author: Agrawal K.; Goktas P.; Kumar N.; Leung M.-F.

Details: Volume 12, July 2025

Abstract: Artificial Intelligence (AI) is emerging as a key driver at the intersection of nutrition and food systems, offering scalable solutions for precision health, smart manufacturing, and sustainable development. This study aims to present a comprehensive review of AI-driven innovations that enable precision nutrition through real-time dietary recommendations, meal planning informed by individual biological markers (e.g., blood glucose or cholesterol levels), and adaptive feedback systems. It further examines the integration of AI technologies in food production, such as machine learning-based quality control, predictive maintenance, and waste minimization, to support circular economy goals and enhance food system resilience. Drawing on advances in deep learning, federated learning, and computer vision, the review outlines how AI transforms static, population-level dietary models into dynamic, data-informed frameworks tailored to individual needs. The paper also addresses critical challenges related to algorithmic transparency, data privacy, and equitable access, and proposes actionable pathways for ethical and scalable implementation. By bridging healthcare, nutrition, and industrial domains, this study offers a forward-looking roadmap for leveraging AI to build intelligent, inclusive, and sustainable food–health ecosystems.



URL: <https://www.frontiersin.org/journals/nutrition/articles/10.3389/fnut.2025.1636980/full>





SCHOLARLY PUBLICATIONS

School of Computer Engineering

KIIT Deemed to be University

Journal Name: Biomedical Signal Processing and Control

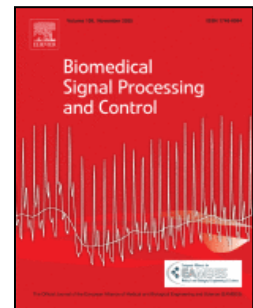
IF: 4.9

Title: A modified Gray Wolf Optimization algorithm for early detection of Parkinson's Disease

Author: Santhosh K.; Dev P.P.; A. B.J.; Lynton Z.; Das P.; Ghaderpour E.

Details: Volume 109, November 2025, Article number 108061

Abstract: Parkinson's disease (PD) is one of the most common neurodegenerative diseases, causing significant morbidity and mortality worldwide. PD can be diagnosed at an early stage by analyzing patient datasets, such as speech and handwriting samples. In this paper, a modified version of the classical Gray Wolf Optimization (GWO) is proposed with an application to detect early-stage PD through processing such datasets. The new model (MGWO-eP) aims to enhance the algorithm's exploration capability (e) and overcome local optima issues by adjusting a key parameter (P) that controls the search agents' positions. The MGWO-eP is then applied as a feature selection technique to predict PD in its early stages, using samples of speech and writing. The effectiveness of MGWO-eP is validated by benchmark optimization functions for achieving the global optimum. Then six popular machine learning classifiers are applied to three benchmark PD prediction datasets that include hand-writing and speech samples from people with and without PD, namely HandPD Spiral, HandPD Meander, and SpeechPD. The proposed model achieves best overall accuracies of 96.30% (with voting), 94.45% (with random forest), and 98.31% (with voting), outperforming GWO and particle swarm optimization algorithms as they get stuck with local optimal solutions. The results show that the proposed model is robust and can be used for early detection of PD in patients through analyzing datasets, such as their handwriting and speech to help the patients access treatments early in the disease, prolonging time spent with adequate symptom control and delaying years of disability/morbidity.



URL: <https://www.sciencedirect.com/science/article/pii/S1746809425005725?via%3Dihub>





SCHOLARLY PUBLICATIONS

School of Computer Engineering

KIIT Deemed to be University

Journal Name: IEEE Transactions on Computational Social Systems

IF: 4.5

Title: Privacy Utility Tradeoff Between PETs: Differential Privacy and Synthetic Data

Author: Razi Q.; Datta S.; Hassija V.; Chalapathi G.S.S.; Sikdar B.

Details: Volume 12, Issue 2, Pages 473 – 484, 2025

Abstract: Data privacy is a critical concern in the digital age. This problem has compounded with the evolution and increased adoption of machine learning (ML), which has necessitated balancing the security of sensitive information with model utility. Traditional data privacy techniques, such as differential privacy and anonymization, focus on protecting data at rest and in transit but often fail to maintain high utility for machine learning models due to their impact on data accuracy. In this article, we explore the use of synthetic data as a privacy-preserving method that can effectively balance data privacy and utility. Synthetic data is generated to replicate the statistical properties of the original dataset while obscuring identifying details, offering enhanced privacy guarantees. We evaluate the performance of synthetic data against differentially private and anonymized data in terms of prediction accuracy across various settings—different learning rates, network architectures, and datasets from various domains. Our findings demonstrate that synthetic data maintains higher utility (prediction accuracy) than differentially private and anonymized data. The study underscores the potential of synthetic data as a robust privacy-enhancing technology (PET) capable of preserving both privacy and data utility in machine learning environments.



URL: <https://ieeexplore.ieee.org/document/10753017>





SCHOLARLY PUBLICATIONS School of Computer Engineering KIIT Deemed to be University

Journal Name: Computers in Biology and Medicine

IF: 4.5

Title: A novel speech signal feature extraction technique to detect speech impairment in children accurately

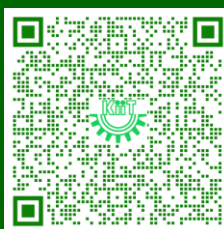
Author: Manoswini M.; Sahoo B.; Swetapadma A.

Details: Volume 195, September 2025

Abstract: Speech signal processing and extracting useful information from speech signal is necessary for speech language impairment (SLI) detection in children. Although different features has been suggested for SLI detection, there is still a scope exist for exploration of other methods. A comparative study of different techniques for feature extraction can be done to find the optimal feature extraction technique. In this work, a study has been carried out to obtain optimal feature extraction technique for SLI detection. Inputs used for SLI detection here are the speech signals recorded from children. Features are first extracted from the recorded speech signals using various feature extraction techniques. The feature extraction techniques that has been implemented are relative spectral transform - perceptual linear prediction (RASTA), wavelet packet transform (WPT), linear predictive coding (LPC), perceptual linear prediction (PLP), Mel-Frequency cepstral coefficients (MFCC), complex quantization cepstral coefficient (CQCC), perceptual noise cepstral coefficients (PNCC). The features extracted are then given to deep learning models namely transformer, temporal convolutional networks (TCN) and TabNet for SLI detection. The result obtained has highest accuracy of 100.00 % using PNCC feature combined with TabNet method. The novelty of the method is that the PNCC features has not been suggested for SLI detection previously. The proposed method can be used for speech impairment detection and monitoring by therapist and doctors.



URL: <https://www.sciencedirect.com/science/article/pii/S0010482525010327?via%3Dihub>





SCHOLARLY PUBLICATIONS School of Computer Engineering KIIT Deemed to be University

Journal Name: Frontiers in Nutrition

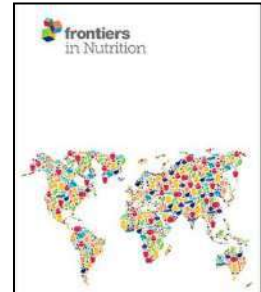
IF: 4.0

Title: AI-driven transformation in food manufacturing: a pathway to sustainable efficiency and quality assurance

Author: Agrawal K.; Goktas P.; Holtkemper M.; Beecks C.; Kumar N.

Details: Volume 12, 2025, Article number 1553942

Abstract: This study aims to explore the transformative role of Artificial Intelligence (AI) in food manufacturing by optimizing production, reducing waste, and enhancing sustainability. This review follows a literature review approach, synthesizing findings from peer-reviewed studies published between 2019 and 2024. A structured methodology was employed, including database searches and inclusion/exclusion criteria to assess AI applications in food manufacturing. By leveraging predictive analytics, real-time monitoring, and computer vision, AI streamlines workflows, minimizes environmental footprints, and ensures product consistency. The study examines AI-driven solutions for waste reduction through data-driven modeling and circular economy practices, aligning the industry with global sustainability goals. Additionally, it identifies key barriers to AI adoption—including infrastructure limitations, ethical concerns, and economic constraints—and proposes strategies for overcoming them. The findings highlight the necessity of cross-sector collaboration among industry stakeholders, policymakers, and technology developers to fully harness AI's potential in building a resilient and sustainable food manufacturing ecosystem.



URL: <https://www.frontiersin.org/journals/nutrition/articles/10.3389/fnut.2025.1553942/full>





SCHOLARLY PUBLICATIONS

School of Computer Engineering

KIIT Deemed to be University

Journal Name: Scientific Reports

IF: 3.8

Title: An intelligent framework for skin cancer detection and classification using fusion of Squeeze-Excitation-DenseNet with Metaheuristic-driven ensemble deep learning models

Author: Dorathi Jayaseeli J.D.; Briskilal J.; Fancy C.; Vaitheeshwaran V.; Patibandla R.S.M.L.; Syed K.; Swain A.K.

Details: Volume 15, Issue 1, December 2025

Abstract: Skin cancer is the most dominant and critical method of cancer, which arises all over the world. Its damaging effects can range from disfigurement to major medical expenditures and even death if not analyzed and preserved timely. Conventional models of skin cancer recognition require a complete physical examination by a specialist, which is time-wasting in a few cases. Computer-aided medicinal analytical methods have gained massive popularity due to their efficiency and effectiveness. This model can assist dermatologists in the initial recognition of skin cancer, which is significant for early diagnosis. An automatic classification model utilizing deep learning (DL) can help doctors perceive the kind of skin lesion and improve the patient's health. The classification of skin cancer is one of the hot topics in the research field, along with the development of DL structure. This manuscript designs and develops a Detection of Skin Cancer Using an Ensemble Deep Learning Model and Gray Wolf Optimization (DSC-EDLMGWO) method. The proposed DSC-EDLMGWO model relies on the recognition and classification of skin cancer in biomedical imaging. The presented DSC-EDLMGWO model initially involves the image preprocessing stage at two levels: contrast enhancement using the CLAHE method and noise removal using the wiener filter (WF) model. Furthermore, the proposed DSC-EDLMGWO model utilizes the SE-DenseNet method, which is the fusion of the squeeze-and-excitation (SE) module and DenseNet to extract features. For the classification process, the ensemble of DL models, namely the long short-term memory (LSTM) technique, extreme learning machine (ELM) model, and stacked sparse denoising autoencoder (SSDA) method, is employed. Finally, the gray wolf optimization (GWO) method optimally adjusts the ensemble DL models' hyperparameter values, resulting in more excellent classification performance. The effectiveness of the DSC-EDLMGWO approach is evaluated using a benchmark image database, with outcomes measured across various performance metrics. The experimental validation of the DSC-EDLMGWO approach portrayed a superior accuracy value of 98.38% and 98.17% under HAM10000 and ISIC datasets across other techniques.



URL: <https://www.nature.com/articles/s41598-025-92293-1>





SCHOLARLY PUBLICATIONS

School of Computer Engineering

KIIT Deemed to be University

Journal Name: Scientific Reports

IF: 3.8

Title: A hybrid fused-KNN based intelligent model to access melanoma disease risk using indoor positioning system

Author: Mishra S.; Das H.; Mohapatra S.K.; Khan S.B.; Alojail M.; Saraee M.

Details: Volume 15, Issue 1, December 2025

Abstract: The Indoor Positioning System (IPS) based technology involves the positioning system using sensors and actuators, where the Global Positioning System (GPS) lacks. The IPS system can be used in buildings, malls, parking lots and several other application domains. This system can also be useful in the healthcare centre as an assisting medium for medical professionals in the disease of the diagnosis task. This research work includes the development and implementation of an intelligent and automated IPS based model for melanoma disease detection using image sets. A new classification approach called Fused K-nearest neighbor (KNN) is applied in this study. The IPS based Fused-KNN is a fusion of three distinct folds in KNN (3-NN, 5-NN and 7-NN) where the model is developed using input samples from various sensory units while involving image optimization processes such as the image similarity index, image overlapping and image sampling which helps in refining raw melanoma images thereby extracting a combined image from the sensors. The IPS based Fused-KNN model used in the study obtained an accuracy of 97.8%, which is considerably more than the existing classifiers. The error rate is also least with this new model which is introduced. RMSE (Root Mean Square Error) and MAE (Mean Absolute Error) value generated with the proposed IPS base Fused-KNN the model for melanoma detection was as low as 0.2476 and 0.542 respectively. An average mean value computed for accuracy, precision, recall and f-score were found to be 94.45%, 95.2%, 94.4% and 94.9% respectively when validated with 12 different cancer-based datasets. Hence the presented IPS based model can prove to be an efficient and intelligent predictive model for melanoma disease diagnosis, but also other cancer-based diseases in a faster and more reliable manner than existing models.



URL: <https://www.nature.com/articles/s41598-024-74847-x>





SCHOLARLY PUBLICATIONS

School of Computer Engineering

KIIT Deemed to be University

Journal Name: IEEE Access

IF: 3.6

Title: Scalable Cold-Start Optimization in Serverless Computing: Leveraging Function Fusion With PanOpticon Simulator

Author: Behera R.K.; Kumari A.; Cho S.-B.

Details: Volume 13, July 2025

Abstract: Serverless computing has transformed cloud computing with its inherent scalability, pay-as-you-go pricing model, and low-latency execution. However, cold-start delays arising from the on-demand initialization of execution environments such as containers or virtual machines remain a persistent bottleneck, particularly for latency-sensitive applications. This paper addresses this challenge by proposing a novel function fusion approach to minimize cold-start latency in serverless environments. The proposed strategy leverages the PanOpticon simulator, a comprehensive platform for deploying and evaluating Function-as-a-Service (FaaS) applications. The proposed approach reduces redundant initialization overhead and improves resource utilization by dynamically merging functions within a workflow. Unlike conventional frameworks, the proposed method integrates function fusion directly into the simulation and evaluation pipeline, enabling more scalable and performance-aware optimizations. Extensive simulation-based evaluations demonstrate that the fusion strategy significantly reduces cold-start delays while enhancing system throughput and responsiveness across diverse workloads. The results confirm that function fusion not only minimizes latency but also maximizes efficiency, making it a robust solution for real-time, scalable serverless applications. This work contributes a practical framework for cold-start mitigation and lays the groundwork for future research in optimizing FaaS-based cloud architectures.



URL: <https://ieeexplore.ieee.org/document/11080425>





SCHOLARLY PUBLICATIONS

School of Computer Engineering

KIIT Deemed to be University

Journal Name: IEEE Access

IF: 3.4

Title: Temporal-Aware Transformer Approach for Violence Activity Recognition

Author: Chatterjee R.; Roy Choudhury R.; Kumar Gourisaria M.; Banerjee S.; Dey S.; Sahni M.; Leon-Castro E.

Details: Volume 13, Article 2025

Abstract: The need for effective violence detection in public spaces has intensified with increasing antisocial behavior and violence. Traditional surveillance systems, which are relying on human operators, face delays and resource challenges. Using advances in artificial intelligence (AI) and computer vision, this research presents a scalable deep learning architecture for real-time violence detection using two approaches. In the first approach, Convolutional Neural Networks (CNN) and bidirectional long-short-term memory (BiLSTM) networks are combined, where MobileNetV2 is used for spatial feature extraction and BiLSTM for temporal pattern recognition, achieving an accuracy of 95.6%. The second approach incorporates a spatial-temporal transformer (TransformerSeq) in place of BiLSTM, improving performance to 97.2% by capturing spatiotemporal relationships in video data more effectively through self-attention for temporal feature learning. The lightweight SOTA MobileNetV2, along with the proposed MobileTransformerSeq, enables the effective differentiation between violent and non-violent activities, demonstrating the potential to enhance public safety in diverse settings.



URL: <https://ieeexplore.ieee.org/document/10965696>





SCHOLARLY PUBLICATIONS School of Computer Engineering KIIT Deemed to be University

Journal Name: IEEE Access

IF: 3.4

Title: Identification of Depression Patients Using LIF Spiking Neural Network Model from the Pattern of EEG Signals

Author: Sahu R.; Pattnaik P.K.; Anbanathen K.S.M.; Muthaiyah S.

Details: Volume 13, Pages 55156 – 55168, 2025

Abstract: Interpreting electroencephalography signals and the abnormality of the signals can help to find the specific pattern for specific diseases like depression. A Spiking Neural Network is a machine learning approach that emphasizes the data value and manipulates the value to find the particular signal feature. Finding the specific abnormal features of electroencephalography signals can help to detect depression patients. Since a vast number of individuals are suffering from depression and the treatment of depression is possible by detecting depression patients earlier, different deep learning and conventional machine learning approaches were proposed. But speed, accuracy, and reality with less time and space complexity are essential factors in detecting depression patients in our society. We have proposed a leaky integrate and fire spiking neural network model for interpreting the electroencephalography signals of depression patients. The electroencephalography signals of a sixty-channel dataset of 121 subjects are taken for the experiment where frequency for each channel of a subject is recorded for 2 mins in 2-second time intervals, and the dataset contains 4,35,600 data with 121 instances and 3600 attributes. A leaky integrate and fire model is applied to the electroencephalography signals to find the spike sequences and potentials. Then, a three-layered neural network approach is stacked to generate a classifier. The performance of the classifier is shown to be approximately 98% accuracy. Generating a noble classifier and implementing it with a mask of metal disk benefited society for easily and quickly detecting a depression patient, and corresponding treatment can be started.



URL: <https://ieeexplore.ieee.org/document/10930766>





SCHOLARLY PUBLICATIONS

School of Computer Engineering

KIIT Deemed to be University

Journal Name: Journal of Visual Communication and Image Representation

IF: 3.1

Title: CA-VAD: Caption Aware Video Anomaly Detection in surveillance videos

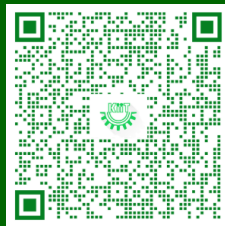
Author: Senapati D.P.; Pani S.K.; Baliarsingh S.K.; Dev P.P.; Tripathy H.K.

Details: Volume 294, December 2025

Abstract: n video anomaly detection, identifying abnormal events using weakly supervised video-level labels is often tackled with multiple instance learning (MIL). However, traditional methods struggle to capture temporal relationships between segments and extract discriminative features for distinguishing normal from anomalous events. To address these challenges, we propose Caption Aware Video Anomaly Detection (CA-VAD), a framework that integrates visual and textual features for enhanced semantic understanding of scenes. Unlike conventional approaches relying solely on visual data, CA-VAD uses a pre-trained video captioning model to generate textual descriptions, transforming them into semantic embeddings that enrich visual features. These textual cues improve the differentiation between normal and abnormal events. CA-VAD incorporates an Attention-based Multi-Scale Temporal Network (A-MTN) to process visual and textual inputs, capturing temporal dynamics effectively. Experiments on CUHK Avenue, ShanghaiTech, UCSD Ped2, and XD-Violence datasets show that CA-VAD outperforms state-of-the-art methods, achieving superior accuracy and robustness.



URL: <https://www.sciencedirect.com/science/article/pii/S104732032500135X?via%3Dihub>





SCHOLARLY PUBLICATIONS School of Computer Engineering KIIT Deemed to be University

Journal Name: Multimedia Tools and Applications

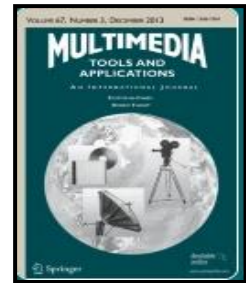
IF: 3.0

Title: Machine learning for brain-stroke prediction: comparative analysis and evaluation

Author: Bhowmick R.; Mishra S.R.; Tiwary S.; Mohapatra H.

Details: Volume 84, August 2025

Abstract: This study focuses on the intricate connection between general health, blood pressure, and the occurrence of brain strokes through machine learning algorithms. To achieve this, we have thoroughly reviewed existing literature on the subject and analyzed a substantial data set comprising stroke patients. Implementing a combination of statistical and machine-learning techniques, we explored how general health indicators, including overall well-being and blood pressure, influence the risk of strokes. The findings of this study hold substantial implications for stroke prevention, treatment, and the development of novel diagnostic tools and therapies. Our ultimate aim is to gain fresh insights into the intricate interplay of general health and blood pressure, aiding in identifying individuals at risk of future brain strokes. This study entails a data-driven analysis of various algorithms across multiple datasets. Within this scope, we have thoroughly examined the behaviours and accuracy of diverse machine learning algorithms, assessing their interrelationships. This research aims to assist novice researchers in comprehending the performance of different machine learning algorithms in the context of brain stroke prediction.



URL: <https://link.springer.com/article/10.1007/s11042-024-20057-6>





SCHOLARLY PUBLICATIONS

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Journal Name: International Review of Retail, Distribution and Consumer Research

IF: 3.0

Title: Evolution of sustainable retailing and how it influences consumer behavior: a bibliometric review

Author: Singh A.P.; Behera R.K.; Bala P.K.

Details: Volume 294, December 2025

Abstract: Over the years, sustainability has garnered much attention owing to evidence of climate change, United Nations (UN) sustainable development goals, pandemics, and the changing behavior of millennials. Retailers are one of the largest consumers of global natural and human resources. They have joined the sustainability bandwagon by pledging resources and communicating the same to their target customers for better business positioning. This study aims to analyze the conceptual structure of sustainability in the context of retail enterprises and its role in shaping consumer behavior. Therefore, it leverages bibliometric techniques to elaborate on the productivity and impact of the existing body of knowledge in this area through performance analysis and discover the knowledge clusters through science mapping. The data used for this study were sourced by querying the Scopus database for the intersection of terms related to 'sustainability,' 'retail,' and 'consumer behavior.' Subsequently, they were processed and illustrated using RStudio and the bibliometrix package for R to drive insights in bibliometric summaries, including tables, maps, and networks. In addition to highlighting temporal and spatial trends and dominant themes, the study suggests future research avenues in sustainable retailing.



URL: <https://www.tandfonline.com/doi/full/10.1080/09593969.2024.2381066>





SCHOLARLY PUBLICATIONS School of Computer Engineering KIIT Deemed to be University

Journal Name: International Journal of Computational Intelligence Systems

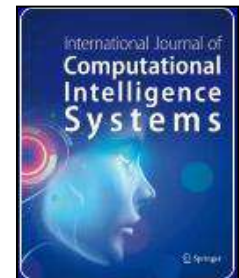
IF: 3.0

Title: Optimized DenseNet Architectures for Precise Classification of Edible and Poisonous Mushrooms

Author: Singh J.P.; Ghosh D.; Singh J.; Bhattacharjee A.; Gourisaria M.K.

Details: Volume 18, Issue 1, December 2025, Article number 143

Abstract: Background: The subtle differences between edible and toxic mushroom species make classification difficult. Traditional methods often result in errors which led to misclassifications and conventional machine learning models often struggle in feature extraction due to subtle differences in mushroom species. Deep learning models, such as DenseNet architectures, offer potential solutions, but due to model complexity, deep architecture and large number of parameters these models suffer from overfitting and computational costs. These can be handled by optimizing the model. This study's primary goal is to enhance the precision and reliability of mushroom classification through deep learning by enhancing the DenseNet-121 structure. Methods: The study analyzes the basic DenseNet-121 model as well as a modified DenseNet-121 with frozen upper layers which preserve important lower level features. Automated hyperparameter tuning is done with KerasTuner, while dropout and weight decay regularization methods are used to control overfitting. Evaluation metrics include accuracy, precision, recall, F1-score, confusion matrices, and other graphical methods. Conclusion: The study demonstrates the effectiveness of architectural modifications and regularization strategies in improving model performance. Despite problems such as possible over-reliance on pre-trained features and computational complexity, the modified DenseNet-121 is useful for accurate mushroom classification. Future study could look into improving freezing procedures and lowering computational demands to extend applicability.



URL: <https://link.springer.com/article/10.1007/s44196-025-00871-y>

