SCHOLARLY PUBLICATIONS
School of Computer Engineering
KIIT Deemed to be University

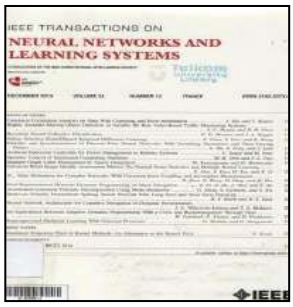
Journal Name: IEEE Transactions on Neural Networks and Learning Systems **IF: 8.9**

Title: Distill to Delete: Unlearning in Graph Networks With Knowledge Distillation

Author: Sinha, Y.; Mandal, M.; Kankanhalli, M.

Details: Volume 37, Issue 1, 2026

Abstract: Graph unlearning has emerged as a pivotal method to delete information from an already trained graph neural network (GNN). One may delete nodes, a class of nodes, edges, or a class of edges. An unlearning method enables the GNN model to comply with data protection regulations (i.e., the right to be forgotten), adapt to evolving data distributions, and reduce the GPU-hours carbon footprint by avoiding repetitive retraining. Removing specific graph elements from graph data is challenging due to the inherent intricate relationships and neighborhood dependencies. Existing partitioning and aggregation-based methods have limitations due to their poor handling of local graph dependencies and additional overhead costs. Our work takes a novel approach to address these challenges in graph unlearning through knowledge distillation, as it distills to delete in GNN (D2DGN). It is an efficient model-agnostic distillation framework where the complete graph knowledge is divided and marked for retention and deletion. It performs distillation with response-based soft targets and feature-based node embedding while minimizing KL-divergence. The unlearned model effectively removes the influence of the deleted graph elements while preserving knowledge about the retained graph elements. D2DGN surpasses the performance of existing methods when evaluated on various real-world graph datasets by up to 43.1% (AUC) in edge and node unlearning tasks. Other notable advantages include better efficiency, better performance in removing target elements, preservation of performance for the retained elements, and zero overhead costs.



URL: https://ieeexplore.ieee.org/document/11197591

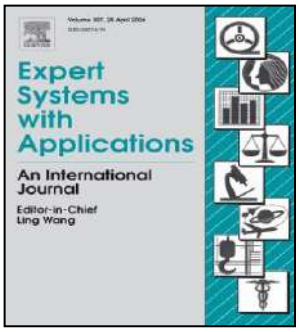
Journal Name: Expert Systems with Applications **IF: 7.5**

Title: Fusing memory and attention: A study on LSTM, transformer and hybrid architectures for symbolic music generation

Author: Ghoshal, S.; Chakraborty, S.; Chowdhury, P.; Buckchash, H.

Details: Volume 308, Issue 1, May 2026

Abstract: Machine learning techniques, such as Transformers and Long Short-Term Memory (LSTM) networks, play a crucial role in Symbolic Music Generation (SMG). Existing literature indicates a difference between LSTMs and Transformers regarding their ability to model local melodic continuity versus maintaining global structural coherence. However, their specific properties within the context of SMG have not been systematically studied. This paper addresses this gap by providing a fine-grained comparative analysis of LSTMs versus Transformers for SMG, examining local and global properties in detail using 17 musical quality metrics on the Deutschl dataset. We find that LSTM networks excel at capturing local patterns but fail to preserve long-range dependencies, while Transformers model global structure effectively but tend to produce irregular phrasing. Based on this analysis and leveraging their respective strengths, we propose a Hybrid architecture combining a Transformer Encoder with an LSTM Decoder and evaluate it against both baselines. We evaluated 1000 generated melodies from each of the three architectures on the Deutschl dataset. The results show that the hybrid method achieves better local and global continuity and coherence compared to the baselines. Our work highlights the key characteristics of these models and demonstrates how their properties can be leveraged to design superior models. We also supported the experiments with ablation studies and human perceptual evaluations, which statistically support the findings and provide robust validation for this work.



URL: https://www.sciencedirect.com/science/article/pii/S0957417426000874?via%3Dihub

SCHOLARLY PUBLICATIONS
School of Computer Engineering
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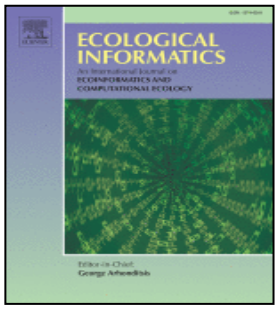
Journal Name: Ecological Informatics **IF: 7.3**

Title: YOLO-HARVEST: A hybrid ViT architecture with locality-enhanced attention for automated wildlife species classification

Author: Paul, A.; Raj, R.; Gourisaria, M.K.; Jha, A.V.; Bizon, N.

Details: Volume 94, March 2026

Abstract: Wildlife conservation efforts increasingly depend on automated species classification for processing large-scale camera trap data, yet existing approaches struggle with accuracy and computational efficiency in resource-constrained environments. This paper introduces HARVEST (Hierarchical Attention for Robust Vision Enhancement with Shifted Tokenization), a novel hybrid architecture integrating YOLOv8 object detection with transformer-based classification. The architecture incorporates three key innovations: Shifted Patch Tokenization (SPT) for boundary information preservation, Local Information Enhancer (LIFE) for spatial feature extraction, and Locality-Enhanced Attention (LEA) for adaptive feature integration. The HARVEST demonstrates excellent performance and achieves 85.27% accuracy on the OSU dataset and 94.74% accuracy on the Wildlife dataset with only 13.0M parameters, representing an 85% reduction compared to standard Vision Transformers while maintaining superior performance. The OSU evaluation demonstrates robust performance across highly imbalanced real-world conditions with species sample sizes ranging from 1 to 6320 images, validating practical applicability for conservation scenarios. Qualitative analysis reveals biologically meaningful attention patterns focusing on taxonomically relevant features. The efficient architecture enables real-world deployment in conservation applications, providing a practical solution for automated wildlife monitoring and biodiversity surveillance.



URL: https://www.sciencedirect.com/science/article/pii/S1574954126000117?via%3Dihub

SCHOLARLY PUBLICATIONS
School of Computer Engineering
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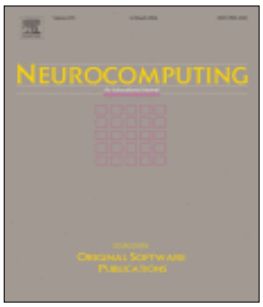
Journal Name: Neurocomputing **IF: 6.5**

Title: Cross-modal uncertainty modeling framework for unseen video anomaly detection

Author: Dev, P.P.; Das, P.; Hazari, R.

Details: Volume 670**,** March 2026

Abstract: Detecting anomalies in videos is essential for surveillance and safety applications, but the scarcity of anomalies and the need for costly frame-level annotation make this task highly challenging. Weakly supervised video anomaly detection (WSVAD) addresses this with video-level labels, yet most methods assume a closed-set setting that restricts generalization to unseen anomalies. We propose a multimodal uncertainty-aware framework that integrates visual, audio, and textual modalities within a dual-stream architecture that combines coarse-grained classification with fine-grained semantic alignment. An Audio-Visual Fusion Refinement Module (AV-FRM) improves cross-modal interaction, while prompt-augmented textual embeddings enhance alignment with anomaly categories. To increase robustness under open-world conditions, an Uncertainty Modeling Framework (UMF) based on evidential deep learning quantifies epistemic uncertainty, and a Cross-Modal Mutual Learning (CMML) strategy aligns fused features with the most confident unimodal source. Experiments on UCF-Crime, ShanghaiTech, MSAD, and XD-Violence demonstrate state-of-the-art performance, achieving AUC scores of 89.23% on UCF-Crime, 98.54% on ShanghaiTech, and 88.47% on MSAD in the closed-set setting, and harmonic means of 91.19%, 98.96%, and 83.55%, respectively, in the open-set setting. On XD-Violence, our method achieves 85.86% AP, which validates the effectiveness of multimodal uncertainty-aware learning for robust anomaly detection and generalization to unseen categories.



URL: https://www.sciencedirect.com/science/article/pii/S0925231225032631?

SCHOLARLY PUBLICATIONS
School of Computer Engineering
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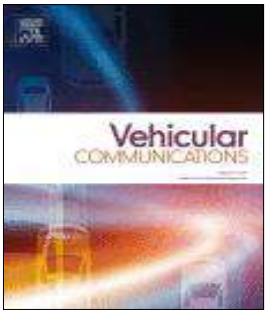
Journal Name: Vehicular Communications **IF: 6.5**

Title: The role of large language models (LLMs) in enhancing intelligent transportation systems: A survey

Author: Hassija, V.; Majumder, T.; Roy, D.; Piyush, R.; Chamola, V.

Details: Volume 58, April 2026

Abstract: Large Language Models (LLMs) are transforming Intelligent Transportation Systems (ITS) by shifting operations from static, rule based systems toward adaptive, data-driven decision-making. This paper presents a comprehensive methodological and application-focused survey of LLMs in ITS, grounded in transformer-based architectures like GPT-4, BERT, and LlaMa. We analyze the technical challenge of integrating diverse multimodal data including sensor logs, visual inputs, and textual reports via cross-modal fusion strategies. The survey examines key applications such as traffic signal optimization, predictive maintenance, V2X communication, public transport scheduling, and route personalization. Furthermore, we detail core methodologies (e.g., fine- tuning, Chain-of-Thought prompting, federated learning, RLHF) used to enhance LLM performance under real-time conditions and assess explainability frameworks (SHAP, LIME) to foster trust. We also identify critical challenges, including model hallucination, privacy risks, resource demands, and latency constraints. By synthesizing insights from over 200 primary research contributions, this work offers a foundational reference for designing scalable, intelligent, and ethically aligned ITS architectures.



URL: https://www.sciencedirect.com/science/article/pii/S2214209625001238?

Journal Name: Future Generation Computer SystemsThe International Journal of eScience **IF: 6.1**

Title: DQVeriChain: Distributed quantum-state-verified and DID-based self-attentive large language model for criminal tracking using blockchain

Author: Shaw, R; Majumder, S

Details: Volume 180, July 2026

Abstract: The increasing complexity of cybercrime and identity manipulation activities demands a secure, verifiable, and quantum-resilient framework for criminal identification. This study introduces 'DQVeriChain', a distributed quantum-state-verified and decentralized identity-based large language model (LLM) designed for criminal tracking using blockchain. The system integrates quantum principal component analysis (QPCA), GHZ state-fidelity validation, and ZZ-feature mapping to ensure high-fidelity quantum entanglement and secure feature encoding. The verification process combines both the Quantum Self-Attention Mechanism (QSAM) and the Quantum Self-Correcting Attention Mechanism (QSCAM) with LLM-driven inference for intelligent anomaly detection. In addition, validation was performed using IBM Qiskit with 10-fold cross-validation and fidelity thresholds (F >= 0.5), achieving prediction accuracy greater than 99% with minimal quantum circuit complexity (5/5 qubits). These experimental results confirm that 'DQVeriChain' offers an efficient, tamper-resistant, and scalable architecture suitable for real-time forensic and cybersecurity applications.

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SCHOLARLY PUBLICATIONS
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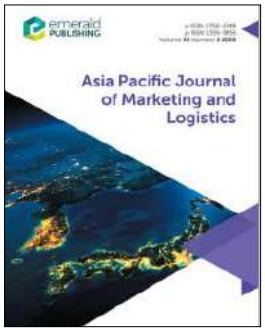
Journal Name: Asia Pacific Journal of Marketing and Logistics **IF: 5.1**

Title: Attractiveness vs similarity: howÂ attributes of AI-based virtual influencers impact credibility, parasocial interaction and purchase intentions of social-media users

Author: Rehman A.U.; Hassan S.H.; Behera R.K.

Details: Volume 38, Issue 2, February 2026

Abstract: Purpose – Virtual influencers (VIs) are a rising force in shaping online user engagement and consumer behavior because, unlike traditional influencers, a VI offers freedom for creativity and provides unique opportunities for brands to control their messaging and advertisements meticulously. Therefore, this study investigates the influence of VI's attributes, including interest similarity, language similarity, physical attractiveness, social attractiveness, and attitude homophily, on their credibility perception and parasocial interaction (PSI) and, subsequently, their effect on willingness to follow recommendations and intention to purchase fashion products promoted by these digital personas on Instagram. Design/methodology/approach – This study collected primary data from 332 Indian Instagram followers of virtual influencers using a structured questionnaire. Subsequently, the analysis was performed using structural equation modeling (PLS-SEM). Findings – The perceived credibility of VIs was significantly influenced by their social attractiveness, physical attractiveness, and attitude homophily, while users' PSI with VIs was significantly influenced by interest similarity, language similarity, physical attractiveness, and attitude homophily. Furthermore, the study found that willingness to follow VI's recommendations is influenced by credibility and parasocial interaction, while intention to purchase fashion products is influenced by credibility alone. Originality/value – There is a dearth of studies that explore the influence of VI's attributes and characteristics on social media users' behavioral intentions in the context of fashion products. Therefore, this study addresses this gap by exploring the persuasive power of VIs on Instagram through the lens of the CASA framework.



URL: https://www.emerald.com/apjml/article/38/2/205/1248925/Attractiveness-vs-similarity-how-attributes-of-AI

SCHOLARLY PUBLICATIONS
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Journal Name: Machine Learning with Applications **IF: 4.9**

Title: Emergence of serverless computing in cloud: A state-of-the-art review of challenges and opportunities

Author: Kumari A.; Behera R.K.; Sahoo K.S.; Sahoo B.; Gandomi A.H.

Details: Volume 24, June 2026

Abstract: Serverless computing has emerged as a prominent cloud application development paradigm over the past decade, enabling developers to deploy and execute applications without managing underlying infrastructure. By abstracting resource provisioning, configuration, and auto-scaling, serverless platforms leverage Backend as a Service (BaaS) and Function as a Service (FaaS) models to execute applications as independent, event-driven functions on managed infrastructure. In this paper, a set of well-defined research questions are formulated to systematically analyze the challenges, design trade-offs, and performance implications of serverless computing. A comparative evaluation with traditional cloud models, including Infrastructure as a Service (IaaS) and Platform as a Service (PaaS), is conducted with respect to cost efficiency and response latency. Beyond existing surveys, this work provides a unified and quantitative synthesis of serverless research by jointly examining architectural features, execution workflows, performance metrics (e.g., cold-start overhead, throughput, and cost-effectiveness), and the availability of frameworks and simulators within a single analytical framework. Unlike prior studies that focus on isolated aspects of serverless systems, this review consolidates insights across multiple dimensions, bridges application and system level perspectives, and identifies underexplored research gaps such as stateful serverless execution, benchmarking reproducibility, and simulator-driven evaluation. The paper concludes by outlining emerging research opportunities, offering a comprehensive and up-to-date reference for researchers and practitioners in cloud and serverless computing.

URL: https://www.sciencedirect.com/science/article/pii/S2666827026000277?via%3Dihub

SCHOLARLY PUBLICATIONS
School of Computer Engineering
KIIT Deemed to be University

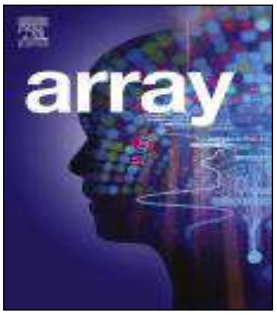
Journal Name: Array **IF: 4.5**

Title: DeiTFake: Deepfake detection model using DeiT multi-stage training

Author: Kumar S.; Singh A.; Thota S.; Singh S.K.; Kumar C.

Details: Volume 29, March 2026

Abstract: Deepfakes are major threats to the integrity of digital media. We propose DeiTFake, a DeiT-based transformer and a two-stage progressive training strategy with increasing augmentation complexity. The approach applies an initial transfer-learning phase with standard augmentations, followed by a fine-tuning phase using advanced affine and color-based augmentations. We use DeiT models pre-trained weights, providing a strong initialization for learning manipulation artifacts, increasing the robustness of the detection model. Trained on a face-cropped dataset derived from the OpenForensics dataset (190,335 images), DeiTFake achieves 98.71% accuracy after stage one and 99.22% accuracy with an AUROC of 99.97%, after stage two, achieving strong performance under the same face-level evaluation setting. We analyze augmentation impact and training schedules, and provide practical benchmarks for facial deepfake detection.



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SCHOLARLY PUBLICATIONS
School of Computer Engineering
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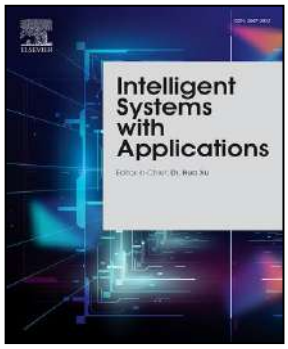
Journal Name: Intelligent Systems with Applications **IF: 4.3**

Title: IndiSegNet: Real-time semantic segmentation for unstructured road scenes in intelligent transportation systems

Author: Chakraborty, P.; Bandyopadhyay, A.; Agrawal, K.; Zhang, J.; Leung, M.-F.

Details: Volume 29, March 2026

Abstract: Autonomous driving in developing regions demands perception systems that can operate reliably in unstructured road environments marked by heterogeneous traffic, weak or missing lane geometry, frequent occlusions, and strong appearance variability. Existing semantic segmentation models, although successful in structured Western datasets, exhibit poor generalization to such chaotic conditions and are often too computationally heavy for real-time deployment on low-power edge hardware. To address these gaps, this paper focuses on the challenge of achieving fast, accurate, and resource-efficient segmentation tailored to complex Indian road scenes. We propose IndiSegNet, a lightweight architecture designed explicitly for this setting. The model introduces two novel components—Multi-Scale Contextual Features (MSCF) for capturing irregular object scales and Encoded Features Refining (EFR) for enhancing thin-structure and boundary detail, resulting in a more stable representation for unstructured environments. IndiSegNet achieves 67.2% mIoU on IDD, 78.9% on Cityscapes, and 74.6% on CamVid, while sustaining 112 FPS on Jetson Nano, outperforming standard baselines by 12%–18% IoU on safety-critical classes such as pedestrians, riders, and vehicles. Real-world evaluation across urban, monsoonal, rural, and mountainous regions shows less than 2.5% variance in mIoU with consistent inference speeds above 108 FPS. These results demonstrate that IndiSegNet offers a practical and hardware-efficient solution for high-speed autonomous navigation in the challenging traffic conditions of developing regions.



URL: https://www.sciencedirect.com/science/article/pii/S2667305326000049?via%3Dihub

SCHOLARLY PUBLICATIONS
School of Computer Engineering
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Journal Name: Scientific Reports **IF: 3.9**

Title: Reversible data hiding for electronic patient information security for telemedicine applications

Author: Muhudin, A; Hussein, OD; Osoble, AM; Mondal, J

Details: Volume 16, Issue 1, February 2026

Abstract: Telemedicine workflows require the secure transmission of medical images while preserving diagnostic integrity. We propose a Reversible Data Hiding in Encrypted Images (RDH-EI) scheme tailored for telemedicine that couples (i) a Generation of Encryption Parameters (GEP) mechanism to derive per-block embedding controls from a data-hiding key and (ii) a two-level Least Significant Bit (LSB) strategy that provides separable payload extraction and exact image recovery. Images are first encrypted using AES-CTR with a unique nonce; GEP then produces block-wise traversal orders, offsets, and parity masks used by Phase-1 (odd blocks, parity-of-triples) and Phase-2 (even blocks, serialized side-information). The method supports three operating modes: payload-only extraction, decrypt-only viewing, and full, bit-exact recovery when both keys are available. On a 90-image test set (30 X-rays, 30 MRIs, 30 CTs, all 512 × 512), the proposed approach achieves higher quality on directly decrypted images than representative baselines at Z = 16: PSNR 39.92 +/- 0.41 dB (X-ray), 37.78 +/- 0.38 dB (MRI), and 38.27 +/- 0.36 dB (CT), with SSIM 0.9784 +/- 0.0021, 0.9694 +/- 0.0023, and 0.9835 +/- 0.0018, respectively. The recovered images are bit-exact (PSNR = infinity). Encryption robustness is supported by near-maximal entropy, high NPCR (> 99%), and UACI near 33%. These results indicate that the proposed GEP-driven, two-level embedding improves the payload-distortion trade-off while retaining strict reversibility, making it suitable for secure medical-image sharing in telemedicine.

URL: https://www.nature.com/articles/s41598-026-39512-5

SCHOLARLY PUBLICATIONS
School of Computer Engineering
KIIT Deemed to be University

Journal Name: Scientific Reports **IF: 3.9**

Title: A real-time industrial safety automation using YOLO architectures leveraging diverse chromatic domains

Author: Pati N.; Sharma A.; Gourisaria M.K.; Jena J.J.; Jha A.V.; Appasani B.; Bizon N.

Details: Volume 16, Issue 1, February 2026

Abstract: Object detection is a crucial component of computer vision with extensive industrial applications. It involves identifying and localizing objects within an image or video frame, surpassing simple image classification by providing bounding boxes for detected objects. In this work, authors used a real-time approach for evaluating YOLO object detection models on a welding defect dataset, using a multispectral approach across diverse chromatic domains. Specifically, the performance of YOLOv3, YOLOv5, and YOLOv8 is analyzed using multiple color spaces—RGB, HSV, LAB, and YCbCr. To examine how color representation affects detection outcomes. YOLO's unified architecture optimizes both speed and accuracy, making it well-suited for real-time industrial safety applications. The results indicate that YOLOv8 demonstrates significant improvements in both accuracy and inference speed over previous versions using RGB color space. A normalized mAP@0.5 of 0.592 was achieved using the RGB color space, highlighting YOLOv8's effectiveness in challenging detection tasks under varying visual conditions. The model's lightweight structure and computational efficiency make it an excellent fit for real-time welding defect detection in diverse industrial environments which has been demonstrated using a real-time framework.

URL: https://www.nature.com/articles/s41598-026-37869-1

SCHOLARLY PUBLICATIONS
School of Computer Engineering
KIIT Deemed to be University

Journal Name: IEEE Access **IF: 3.6**

Title: Hybrid DenseNet Architectures and KerasTuner-Based Optimization for Rice Leaf Disease Detection

Author: Singh J.P.; Ghosh D.; Kumar A.; Bilgaiyan S.; Kumar R.; Singh J.

Details: Volume 14, February, 2026

Abstract: Accurate identification of rice leaf diseases is essential to securing agricultural productivity and mitigating crop losses. Manual approaches are often inefficient and unreliable, particularly in large-scale farming. Although deep convolutional neural networks such as DenseNet have been applied to this task, their default configurations may not fully capture fine-grained disease features. This study aims to develop a series of enhanced DenseNet models that incorporate architectural improvements and optimized learning parameters to achieve highly reliable classification of rice leaf pathologies. We implemented baseline and modified versions of DenseNet121, DenseNet169, and DenseNet201, integrating Squeeze-and-Excitation (SE) blocks to enhance channel-wise feature calibration. To improve generalization and convergence, the models were fine-tuned using Keras Tuner with a focus on optimizing the number of dense units, dropout rates, and learning rates. The proposed hybrid framework combines Squeeze-and-Excitation-enhanced DenseNet architectures with KerasTuner-based hyperparameter optimization, enabling joint feature refinement and systematic model optimization, which distinguishes it from existing DenseNet-based rice leaf disease detection approaches. Its predictions exhibited strong confidence with minimal uncertainty, as evidenced by clear bimodal probability distributions and minimal misclassification in confusion matrices. The models developed in this work demonstrate robust accuracy, strong interpretability, and practical viability for deployment in precision agriculture systems aimed at early disease detection.

URL: https://ieeexplore.ieee.org/document/11396647

SCHOLARLY PUBLICATIONS
School of Computer Engineering
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Journal Name: IEEE Access **IF: 3.6**

Title: Climate-Sensitive Modeling of Rice Stock in Odisha Using Hybrid Machine Learning and Explainable AI

Author: Mohanty N.K.; Mallick P.K.; Tripathy H.K.

Details: Volume 14, February 2026

Abstract: Climate variability has increased uncertainty in agricultural production and post-harvest management, yet most existing studies focus on average crop yields at aggregated spatial scales and rely either on linear statistical models with limited flexibility or closed model machine learning models with poor interpretability. As a result, district-level forecasting of climate-sensitive rice stock dynamics remains insufficiently addressed, particularly in highly vulnerable regions such as Odisha, India. This study addresses this gap by developing a district-level, climate-aware forecasting framework that jointly improves accuracy, robustness, and interpretability. A stacked hybrid model integrating an Artificial Neural Network and XGBoost through a linear meta-regressor is proposed to capture nonlinear climate effects and structured residual patterns in rice stock variability. Monthly agro-climatic variables including temperature, rainfall, humidity, wind speed, and evapotranspiration are combined with district-level rice stock data for representative agro-climatic zones of Odisha. The model is evaluated against statistical baselines, time-series benchmarks, and standalone machine learning models using a time-aware validation strategyThese findings demonstrate that climate-aware hybrid modelling provides reliable and interpretable forecasts, supporting practical applications such as adaptive sowing decisions, irrigation planning, storage management, and evidence-based rice stock regulation in climate-vulnerable regions.

URL: https://ieeexplore.ieee.org/document/11398075

SCHOLARLY PUBLICATIONS
School of Computer Engineering
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Journal Name: Advances in Computers **IF: 3.1**

Title: The future of hepatology: Leveraging PyCaret and streamlit for disease classification and prediction

Author: Swain K.; Nayak S.R.; Mohapatra S.K.; Palai G.

Details: February 2026

Abstract: The rise of chronic kidney disease, a situation deteriorated by factors like pollution and lifestyle choices, is the major concern of this work. The solution to that problem is a predictive model using neural networks. We create and tune a model to predict the occurrence of kidney disease by using the Python library PyCaret, which is well known for its efficiency and simplicity in machine learning workflows. Streamlit, an interactive web framework, makes it easy to implement the model on local systems. In this project, we simplify coding, model creation, and deployment. Our dataset of 416 records from Andhra Pradesh, India, is the basis of our study. The project's goal is to accurately predict the onset of kidney disease and, moreover, to provide the correct interventions in time, thus lessening the healthcare professionals' burden. The approach has been accomplished by the use of machine learning in healthcare, which is a dependable tool for the early identification of the disease and the efficient management of limited resources.

URL:https://www.sciencedirect.com/science/chapter/bookseries/abs/pii/S0065245826000069?via%3Dihub

SCHOLARLY PUBLICATIONS
School of Computer Engineering
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Journal Name: Physica A: Statistical Mechanics and its Applications **IF: 3.1**

Title: QGCNLP: Hybrid Quantum–classical Graph Convolutional Network based Link Prediction

Author: Singh N.; Kumar M.; Sharma J.; Biswas B.

Details: Volume 689, May 2026

Abstract: Recently, graph convolutional networks (GCN) have become very popular due to the fact that they are an effective way to perform convolution on a non-Euclidean space-like graph and that convolution operations on neural networks have produced remarkable results. However, GCN experiences speed and memory limitations on traditional computing platforms as the network's size and complexity increase. Quantum computing, on the other hand, has proven to be very effective in increasing expressiveness by exploring the high-dimensional Hilbert space for complex correlation, alongside providing extraordinarily high computational parallelism. As a result, there is considerable potential for integrating these two advanced technologies. Therefore, we suggested a novel hybrid Quantum–classical Graph Convolutional network-based Link Prediction (QGCNLP) model for the complex task of Link Prediction. This model applies quantum enhancements in a very unique way; instead of converting all input features to quantum data, it applies quantum circuits to the aggregated features obtained after graph convolution in every GCN layer. The quantum-enhanced aggregated values are passed repeatedly till the readout layer, just like the traditional GCN message passing, and then optimized for minimizing the link prediction loss. This approach boosts the model's performance without demanding substantial quantum resources, qubit counts, circuit variations, a number of benchmark classical models, and state-of-the-art methods.

URL: https://www.sciencedirect.com/science/article/pii/S0378437126001858?via%3Dihub

SCHOLARLY PUBLICATIONS
School of Computer Engineering
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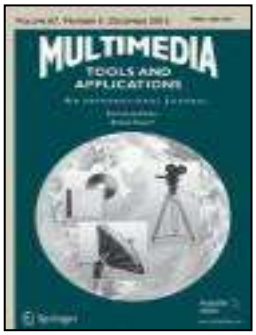
Journal Name: Multimedia Tools and Applications **IF: 3.0**

Title: A novel method to identify speech impairment in children using pitch features and stacked LSTM recurrent neural network

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

Details: Volume 85, Issue 2, February 2026

Abstract: In primary school children, delay in speech and language development has been observed recently more than before. It is essential to detect the delay early and provide speech therapy to improve the quality of speech. Doctors can provide recommendations to avoid speech delay and enhance the child's development. The objective of the work is to detect speech impairment in children to enhance their development. Another objective is to develop a single speech impairment detection module that can detect impairment in all type of speech such as vowels, consonants, one/two/three syllables, difficult words, etc. The inputs used to detect speech impairment are speech recordings from children. The pitch features are then extracted from speech signals called as CHROMA features. The pitch features are then given as input to recurrent neural network called stacked LSTM network to detect speech impairment. The result of the speech impairment detection method is analyzed in terms of precision, recall, AUC, F1-score and accuracy. The F1-score is 1 and accuracy is 99.99% for speech impairment detection for different type of speech. The F1-score is 0.999, and the accuracy of the method is found to be 99.99% for combined speech impairment detection. The speech impairment detection has been also compared with MFCC feature based method and it is found that CHROMA features are detecting speech impairment more accurately. Advantage of the method is that it can detect all type of impaired speech using a single module.



URL: https://link.springer.com/article/10.1007/s11042-026-21284-9