**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, 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

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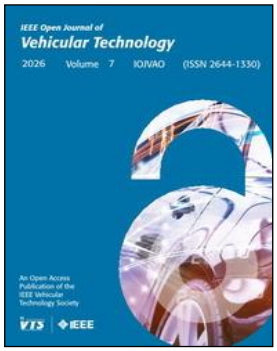
**Journal Name: IEEE Open Journal of Vehicular Technology** **IF: 6.6**

**Title**: A Survey on LLM-Enabled UAV Digital Twins for Internet of Vehicles Systems

**Author:** Bajoria S.; Kanrar S.; Pandey H.; De P.; Akash A.; Hassija V.; Chamola V.

**Details:** June 2026

**Abstract:** Vehicular Digital Twins (VDTs) are emerging as a core enabler for real-time monitoring, simulation, and intelligent control in Internet of Vehicles (IoV) systems. While prior research has largely focused on ground vehicles, the integration of Unmanned Aerial Vehicles (UAVs) into vehicular digital twin ecosystems remains underexplored. This paper presents a comprehensive survey on the role of Large Language Models (LLMs) in enabling UAV Digital Twins for autonomous and cooperative operations within IoV environments. By conceptualizing UAVs as cyber-physical entities continuously synchronized with their virtual counterparts, we analyze how LLMs act as cognitive engines for high-level reasoning, multimodal perception grounding, natural-language interaction, and adaptive mission planning. The survey introduces an LLM-enabled UAV Digital Twin architecture incorporating edge-cloud collaboration, real-time state mirroring, and safety-aware control. Communication workflows leveraging vehicular networking paradigms such as V2X are discussed to support low-latency synchronization and fleet-level coordination. Key application domains, including disaster response, infrastructure monitoring, and Drone-as-a-Service within IoV systems, are examined. Finally, open challenges related to real-time synchronization, computational constraints, and scalability are highlighted, along with future research directions involving TinyLLMs, federated learning, and edge-enabled digital twin platforms.




**URL:** https://ieeexplore.ieee.org/document/11544113

**Journal Name: Future Generation Computer Systems** **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.


**URL:**https://www.sciencedirect.com/science/article/pii/S0167739X26000464?pes=vor&utm_source=clarivate&getft_integrator=clarivate

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**Journal Name: IEEE Transactions on Emerging Topics in Computational Intelligence** **IF: 6.0**

**Title**: Generation and Evaluation of Privacy-Preserving Tabular Synthetic Data Using Self-Attention Generative Adversarial Networks

**Author:** Razi, Q; Chougule, A; Chalapathi, GSS; Hassija, V; Sikdar, B

**Details:** May 2026

**Abstract:** The rapid advancements in Artificial Intelligence (AI) and Machine Learning (ML) have led to the generation of synthetic data using Generative Adversarial Networks (GANs). The generation of high-fidelity synthetic data has become increasingly important in various fields, including healthcare, finance, and social sciences, where data privacy and scarcity pose significant challenges for training ML models. In healthcare and finance, where data privacy is paramount, synthetic data provides a valuable alternative to real data, facilitating research and model development. This paper presents a Self-Attention GAN. This GAN significantly improves the performance of tabular data by incorporating a Self-Attention mechanism in the Discriminator compared to other existing GANs. We evaluated our model using various tabular data, comparing its performance with existing GAN-based approaches. Our results demonstrate that the inclusion of Self-Attention improves the ability of the model to capture complex dependencies within the input data, leading to synthetic datasets that closely mirror the statistical properties of the original data. The improved synthetic data ensures privacy while retaining high utility for machine learning tasks.


**URL:** https://xplorestaging.ieee.org/document/11534305

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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.


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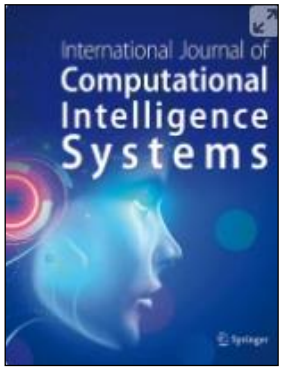
**Journal Name: International Journal of Computational Intelligence Systems** **IF: 4.0**

**Title**: Yellow Banded Wasp Algorithm: A Competition-driven Territorial Search Optimizer for Reliable Alignment of Point Cloud Registration

**Author:** Agrawal U.K.; Panda N.; Aluvalu R.; Tejani G.G.

**Details:** Volume 19, Issue 1, December 2026

**Abstract:** This paper presents a fresh swarm-based metaphorical approach termed the Yellow Banded Wasp Algorithm (YBWA) that mimics the adaptive communal dynamics of yellow-banded wasps. The YBWA employs the competition-driven territorial search (CDTS) and the memory-based updating procedure, allowing a balance between exploration and exploitation. The CDTS enables the wasps to adopt a decentralized approach to decision-making, while the memory archive retains the elite solution for future iterations. When utilized together, these aspects simplify the population diversity and the convergence dynamics to the global optimum. The adeptness of YBWA has been meticulously benchmarked on the IEEE-CEC-2017 test functions across dimensions 10 and 30, and the IEEE-CEC-2022 test suite over dimensions 10 and 20. The suggested YBWA outperforms eleven present-day optimization approaches (OAs) in terms of the mean fitness value across all the function types. A chain of non-parametric assessments has been carried out to substantiate the exclusivity of the YBWA. Furthermore, the YBWA has been employed to assess the six rigid transformation components for the Point Cloud Registration (PCR) utilizing the Bildstein Station 1 dataset. The YBWA yields an exact spatial alignment of the point clouds, characterised by low registration error and an optimized set of transformation components. Hence, the YBWA is a viable and reliable approach to be deployed as an optimizer for the registration process and optimistic tasks (OTs).




**URL:** https://link.springer.com/article/10.1007/s44196-026-01363-3

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**Journal Name: Frontiers in Human Neuroscience** **IF: 3.6**

**Title**: Speech impairment detection in children using time frequency features of speech and deep learning techniques

**Author:** Manoswini, M; Swain, BR; Sahoo, B; Gourisaria, MK; Jha, AV; Bizon, N; Swetapadma, A

**Details:** Volume 20, May 2026

**Abstract:** Speech impairment in children is nowadays occurring more commonly than in earlier days. It is necessary to detect the impairment in speech as early as possible to provide therapeutic treatments. In this work, a novel method has been suggested for speech impairment detection. First, speech signals are collected from children, including vowels, consonants, and different syllables. The speech signals are then processed using gammatone filter bank-based cepstral coefficients (GFCC) and discrete wavelet transform (DWT) for time-frequency feature extraction. DWT is a time-frequency feature that is extracted with the Haar wavelet. The proposed work uses a 5-fold cross-validation method for implementation. The features are then given to various learning technologies for designing the training speech impairment detection module. The learning technologies used are shallow learning (multilayer perceptron (MLP) and support vector machine (SVM)), shallow ensemble learning (gradient boosting (GBoost), extreme gradient boosting (XGBoost), categorical boosting (CatBoost), light gradient boosting machine (lightGBM), Stacking) and deep learning (Convolutional long short term memory (ConvLSTMs), bidirectional LSTM (BiLSTMs), convolutional neural network LSTM (CNN-LSTM), gated recurrent units CNN (GRU-CNN)) methods. It is observed that the highest accuracy of 99.67% is obtained using the GRU-CNN method with DWT features. Yet another contribution is that all speech signals combined are given as input in one module, unlike existing methods that are designed with a separate module for each type of speech. Based on the findings, it is feasible to develop a computational framework for detecting speech impairment based on time frequency representations of speech signals along with deep learning methods.

**URL:**https://www.frontiersin.org/journals/human-neuroscience/articles/10.3389/fnhum.2026.1766439/full

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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