SCHOLARLY PUBLICATIONS
School of Computer Application
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Journal Name: Information Fusion **IF: 14.8**

Title: A clinical diabetes prediction based support system based on the multi-objective metaheuristic inspired fine tuning deep network

Author: Dhal P.; Pradhan B.; Fiore U.; Francis S.A.J.; Roy D.S.

Details: Volume 122, October 2025

Abstract: Diabetes Mellitus (DM), a condition that requires early detection and prompt treatment to prevent life-threatening complications, is a critical focus in intelligent healthcare. Accurate diagnosis and prediction of DM are hindered by challenges such as the lack of comprehensive annotated data and an incomplete understanding of the complex interplay between the disease and various physiological factors. To address these challenges, this research introduces MOODM-Net, a Multi-Objective Optimization (MOO)-based deep network for DM prediction. A novel hybrid Feature Selection (FS) approach, combining multi-objective Harris Hawk Optimization (HHO) with Gray Wolf Optimization (GWO), is used to identify the most informative features from different data sources. This FS step, a critical aspect of data fusion in smart healthcare, aims to extract meaningful insights from potentially noisy and redundant information collected from diverse sources such as wearable sensors, Electronic Health Records (EHRs), and genetic data. Using these carefully selected features, the proposed deep network is fine-tuned with a hybrid exploration–exploitation strategy to optimize its performance for accurate DM prediction. Experimental validation on two widely used DM datasets demonstrates that MOODM-Net outperforms existing approaches, achieving superior prediction accuracy. This highlights the potential of this data fusion-driven approach for improving DM management and advancing personalized healthcare solutions within smart healthcare systems.

URL: https://www.sciencedirect.com/science/article/pii/S1566253525002611?via%3Dihub

SCHOLARLY PUBLICATIONS
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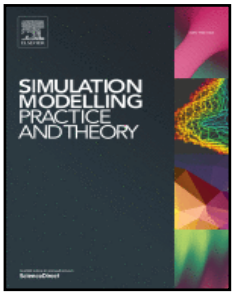
Journal Name: Simulation Modelling Practice and Theory **IF: 4.6**

Title: JaGW: A hybrid meta-heuristic algorithm for IoT workflow placement in fog computing environment

Author: Apat H.K.; Sahoo B.

Details: Vol. 144, November 2025, Article no. 103163

Abstract: In recent years, applications of the Internet of Things (IoT) have experienced rapid growth, driven by the widespread adoption of IoT devices in various sectors. However, these devices are typically resource-constrained in terms of computing power and storage capacity. As a result, they often offload the generated data and tasks to nearby edge devices or fog computing layers for further processing and execution. The fog computing layer is located in close vicinity of the IoT devices and comprises a set of heterogeneous fog computing nodes to supplement the capacities of resource-constrained IoT devices. The fog computing nodes often pose computational challenges for various computation-intensive tasks such as image processing application, comprises various machine learning and artificial intelligence enabled tasks. In such a scenario, finding the effective task placement for dynamic and heterogeneous applications is computationally hard. In this work, we formulate the IoT application workflow placement problem as a multi-objective optimization problem formulated as Integer Linear Programming (ILP) model with the objective of minimizing the makespan, cost of execution, and energy consumption. A hybrid metaheuristic approach is proposed that combines the strengths of the Jaya algorithm (JA) and Grey Wolf Optimization (GWO) named as JaGW to derive a sub-optimal solution. The proposed JaGW is compared with conventional GWO and other state of the art algorithms such as Ant Colony Optimization (ACO) and Particle Swarm Optimization (PSO) using the Montage scientific workflow dataset. The simulation results demonstrate that the proposed algorithm achieves an average reduction in energy consumption of 24.84% compared to JAYA, 14.67% compared to ACO, 14.65% compared to PSO, and 8.78% compared to GWO, thereby exemplifying its superior performance over other metaheuristic algorithms.



URL: https://www.sciencedirect.com/science/article/pii/S1569190X2500098X?via%3Dihub

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

Title: Integration of metaheuristic based feature selection with ensemble representation learning models for privacy aware cyberattack detection in IoT environments

Author: Karthikeyan M.; Brindha R.; Vianny M.M.; Vaitheeshwaran V.; Bachute M.; Mishra S.; Dash B.B.

Details: Vol. 15, Issue 1, December 2025, Article no. 22887

Abstract: The Internet of Things (IoT) connects virtual and physical objects inserted with software, devices, and other technology that interchange data utilizing the Internet. It enables diverse devices and individuals to exchange data, interconnect, and personalize services to ease usage. Despite IoT's merits, rising cyberthreats and the rapid growth of smart devices increase the risk of data breaches and security attacks. The increasing complexity of cyberattacks demands advanced intrusion detection systems (IDS) to defend crucial assets and data. AI techniques such as machine learning (ML) and deep learning (DL) have shown robust potential in improving IDS performance by accurately detecting and classifying malicious network behavior in IoT environments. The data normalization stage initially applies Z-score normalization to convert input data into a beneficial format. The AMFS-ELPPCD model utilizes the adaptive Harris hawk optimization (AHHO) model for the feature process selection of the subset. Furthermore, ensemble models such as bidirectional gated recurrent unit (BiGRU), Wasserstein autoencoder (WAE), and deep belief network (DBN) are used for the classification process. Finally, social group optimization (SGO) optimally adjusts the ensemble classifiers' hyperparameter values, resulting in better classification performance. A set of simulations is performed to exhibit the promising results of the AMFS-ELPPCD under dual datasets. The experimental validation of the AMFS-ELPPCD technique portrayed a superior accuracy value of 99.44% and 98.85% under the CICIDS-2017 and NSLKDD datasets over existing models.

URL: https://www.nature.com/articles/s41598-025-05545-5

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

Title: A deep dive into artificial intelligence with enhanced optimization-based security breach detection in internet of health things enabled smart city environment

Author: Jayanthi S.; Suhasini S.; Sharmili N.; Laxmi Lydia E.; Shwetha V.; Dash B.B.; Bachute M.

Details: Vol. 15, Issue 1, December 2025, Article no. 22909

Abstract: Internet of Health Things (IoHT) plays a vital role in everyday routine by giving electronic healthcare services and the ability to improve patient care quality. IoHT applications and devices become widely susceptible to cyber-attacks as the tools are smaller and varied. Additionally, it is of dual significance once IoHT contains tools applied in the healthcare field. In the context of smart cities, IoHT enables proactive health management, remote diagnostics, and continuous patient monitoring. Therefore, it is essential to advance a strong cyber-attack detection method in the IoHT environments to mitigate security risks and prevent devices from being vulnerable to cyber-attacks. So, improving an intrusion detection system (IDS) for attack identification and detection using the IoHT method is fundamentally necessary. Deep learning (DL) has recently been applied in attack detection because it can remove and learn deeper features of known attacks and identify unknown attacks by analyzing network traffic for anomalous patterns. This study presents a Securing Attack Detection through Deep Belief Networks and an Advanced Metaheuristic Optimization Algorithm (SADDBN-AMOA) model in smart city-based IoHT networks. The main aim of the SADDBN-AMOA technique is to provide a resilient attack detection method in the IoHT environment of smart cities to mitigate security threats. The effectiveness of the SADDBN-AMOA method is investigated under the IoT healthcare security dataset. The experimental validation of the SADDBN-AMOA method illustrated a superior accuracy value of 98.71% over existing models.

URL: https://www.nature.com/articles/s41598-025-05850-z

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

Title: Advanced transformer with attention-based neural network framework for precise renal cell carcinoma detection using histological kidney images

Author: Eliazer, M.; Kumar, G.M.; Amaran, S.; Shasikala, Y.; Sahu, M.; Dash, B.B.; Bala, K.

Details: Vol. 15, Issue 1, December 2025

Abstract: Renal cell carcinoma (RCC) is one of the typical categories of kidney cancer and is a varied group of malignancies arising from epithelial cells of the kidney parenchyma. RCC has more than ten subtypes. Classification of RCC sub-types is mainly according to morphologic features seen on histopathological hematoxylin and eosin (H & E)–stained slides. The histology classification of RCCs is of great significance, considering the important therapeutic and prognostic implications of its histologic subtypes. Imaging models play a prominent role in the diagnosis, follow-up, and staging of RCC. Recently, deep learning (DL) has achieved advanced performance in various computer vision tasks, including segmentation, image classification, and object detection. With the provision of sufficient data, the precision of a DL-enabled diagnosis model frequently matches or even exceeds that of qualified doctors. This paper presents an Advanced Transformer and Attention-Based Neural Network Framework for the Intelligent Detection of Renal Cell Carcinoma (ATANNF-IDRCC) model. The aim is to develop an accurate and automated model for detecting and ranking RCC using kidney histopathology images. Initially, the image pre-processing stage utilizes the contrast enhancement method to enhance the image quality. Furthermore, the ATANNF-IDRCC model utilizes the Twins-Spatially Separable Vision Transformer (Twins-SVT) method for feature extraction. For the RCC classification process, a hybrid model of bidirectional temporal convolutional network and long short-term memory with an attention mechanism (BiTCN-BiLSTM-AM) is employed. The performance analysis of the ATANNF-IDRCC technique is examined under the RCCGNet dataset. The comparison study of the ATANNF-IDRCC technique demonstrated a superior accuracy value of 98.26% compared to existing models.

URL: https://www.nature.com/articles/s41598-025-19352-5

SCHOLARLY PUBLICATIONS
School of Computer Applications
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Journal Name: Sustainable Computing: Informatics and Systems **IF: 3.8**

Title: LESP:A fault-aware internet of things service placement in fog computing

Author: Apat H.K.; Sahoo B.

Details: Volume 32, Issue 2, 2025

Abstract: The rapid advancement of 5G networks enables increase adoption of Industrial Internet of Things (IIoT) devices which introduces variety of time-sensitive applications requires low-latency, fault-tolerant, and energy-efficient computing environments. Fog computing infrastructure that extends cloud computing capabilities at the network edge to provide computation, communication, and storage resources. Due to the limited computing capacity of the Fog node, it restricts the number of tasks executed. The other key challenges are the risk of hardware and software failure during task execution. These failures tend to disrupt the configuration of fog computing nodes, affecting the reliability and availability of services. As a result, this can negatively impact the overall performance and service level objectives. The fault-tolerant-based IoT service placement problem in the fog computing environment primarily focuses on optimal placement of IoT services on fog and cloud resources with the objective of maximizing fault tolerance while satisfying network and storage capacity constraints. In this study, we compared different community-based techniques Girvan-Newman and Louvain with Integer Linear Programming (ILP) for fault tolerance in fog computing using the Albert-Barabási network model. In addition, it proposed a novel Louvian based on eigenvector centrality service placement (LESP) to improve conventional Louvian methods. The proposed algorithm is simulated in iFogSim2 simulator under three different scenario such as under 100, 200 and 300 nodes. The simulation results exemplify that LESP improves fault tolerance and energy efficiency, with an average improvement of approximately 20% over Girvan-Newman, 25% over ILP, and 12.33% over Louvain. These improvements underscore LESP's strong efficiency and capability in improving service availability across a wide range of network configurations.

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SCHOLARLY PUBLICATIONS
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Journal Name: Results in Control and Optimization **IF: 3.2**

Title: Customer satisfaction in peer-to-peer lending platforms: A text mining and sentiment analysis approach

Author: S.P., Kumari, Sarasanabelli Prasanna; A.B., Ali, Ali B.M.; M., Mohanty, Madhusmita; B.B., Dash, Bibhuti Bhusan; M., Rafiq, Muhammad; S.N., Mohanty, Sachi Nandan; I., Shernazarov, Iskandar; N.A., Othman, Nashwan Adnan; N., Batool, Nadia

Details: Volume 20, September 2025

Abstract: This study examines customer experience and satisfaction with peer-to-peer (P2P) lending platforms in India by analyzing user-generated online reviews. Despite the rapid expansion of India's P2P lending market, few studies have analyzed consumer feedback to evaluate platform performance. To address this gap, 11,000 customer reviews were scraped from nine leading Indian P2P platforms. Text mining and sentiment analysis techniques, specifically Frequency Analysis, Convergence of Iterated Correlations (CONCOR) cluster analysis, and Exploratory Factor Analysis (EFA) were employed to extract latent satisfaction drivers. The analysis identified key experience drivers such as customer support, loan processing speed, usability, and fraud-related concerns. EFA distilled these into three underlying satisfaction factors: Positive Experiences and Core Functionalities, Customer Support and Overall Experience, and Efficiency in Application Interaction. The study reveals India-specific insights into digital lending behavior and provides targeted recommendations for improving platform trust, responsiveness, and financial accessibility, essential to user retention and financial inclusion in India's evolving FinTech ecosystem.

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SCHOLARLY PUBLICATIONS
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Journal Name: Forecasting **IF: 3.2**

Title: SGR-Net: A Synergistic Attention Network for Robust Stock Market Forecasting

Author: Khansama, R.R.; Priyadarshini, R.; Nanda, S.K.; Kumar Barik, R.K.; Saikia, M.J.

Details: Vol. 7, Issue 3, September 2025

Abstract: Owing to the high volatility, non-stationarity, and complexity of financial time-series data, stock market trend prediction remains a crucial but difficult endeavor. To address this, we present a novel Multi-Perspective Fused Attention model (SGR-Net) that amalgamates Random, Global, and Sparse Attention mechanisms to improve stock trend forecasting accuracy and generalization capability. The proposed Fused Attention model (SGR-Net) is trained on a rich feature space consisting of thirteen widely used technical indicators derived from raw stock index prices to effectively classify stock index trends as either uptrends or downtrends. Across nine global stock indices—DJUS, NYSE AMEX, BSE, DAX, NASDAQ, Nikkei, S&P 500, Shanghai Stock Exchange, and NIFTY 50—we evaluated the proposed model and compared it against baseline deep learning techniques, which include LSTM, GRU, Vanilla Attention, and Self-Attention. Experimental results across nine global stock index datasets show that the Fused Attention model produces the highest accuracy of 94.36% and AUC of 0.9888. Furthermore, even at lower epochs of training, i.e., 20 epochs, the proposed Fused Attention model produces faster convergence and better generalization, yielding an AUC of 0.9265, compared with 0.9179 for Self-Attention, on the DJUS index. The proposed model also demonstrates competitive training time and noteworthy performance on all nine stock indices. This is due to the incorporation of Sparse Attention, which lowers computation time to 57.62 s, only slightly more than the 54.22 s required for the Self-Attention model on the Nikkei 225 index. Additionally, the model incorporates Global Attention, which captures long-term dependencies in time-series data, and Random Attention, which addresses the problem of overfitting. Overall, this study presents a robust and reliable model that can help individuals, research communities, and investors identify profitable stocks across diverse global markets.

URL: https://www.mdpi.com/2571-9394/7/3/50