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JOURNAL ABSTRACTS

February 2026

Sl. No	Article	Author	Source	Year
1	A Rough Set Based Parallel Verification Model for Accounting Mining Systems	Wei Zeng	Journal of Data Processing Vol: 15 No: 4	2025

Abstract: The paper proposes a cloud based data integrity verification algorithm for accounting informationization systems, leveraging rough set based data mining techniques. With the integration of cloud computing into financial management, data security and integrity have become critical concerns due to risks like data breaches and accidental loss as illustrated by real world incidents involving Huawei and Tencent Cloud. Traditional verification methods, such as HMAC or RSA based Provable Data Possession (PDP), suffer from high computational and communication overheads, especially under dynamic data operations. To address these limitations, the author introduces a parallel verification algorithm that supports multi user batch validation, significantly reducing communication costs and verification time. By employing rough set theory, the system performs efficient feature selection and attribute reduction, enhancing computational efficiency without compromising data integrity. The verification process uses BLS signatures with homomorphic properties, allowing multiple files to be verified at the communication cost of a single file. Experimental results show that the proposed algorithm outperforms conventional single point verification methods, especially as user scale and data volume increase. The system also offers tiered audit levels that balance detection accuracy, verification frequency, and cost. Implemented in a Java/SQL Server environment, the approach demonstrates improved scalability and suitability for accounting cloud environments, offering a practical solution for secure, efficient financial data management in the era of digital transformation.

Sl. No	Article	Author	Source	Year
2	Triggers and Barriers of Rural Women Entrepreneurs: An Empirical Study	P. Paramshivaiah, B. T. Sampath Kumar	Journal of Data Processing Vol: 15 No: 4	2025

Abstract: Rural women's entrepreneurship has been rising rapidly. More prominent businesses can be seen. Women entrepreneurs in rural areas have taken up business activities on the basis of many driving forces. As Indian women are in no way inferior to men in all walks of life and they are as good as men in entrepreneurial skills, it is imperative to exploit the potential of Indian women. Women's

participation in trade, industry and commerce requires entrepreneurship. Studies have been done to understand the women entrepreneurs in general. Rural entrepreneurship is relatively under researched. The present study is an attempt to understand the triggers and barriers to women entrepreneurs in rural areas, in particular. A sample of 280 respondents from 10 villages in Hassan and Mysore Districts was collected using an interview schedule. Factor analysis and ANOVA were applied to test the hypothesis. The results show that there is no difference in respondent's opinions regarding triggers. In contrast, there is no common opinion, i.e. no common problems for all the types of businesses. Every kind of enterprise has its own problems. We suggest for government financial assistance to rural women and educational support. We also recommend enhancing women's outlooks by fostering a positive attitude.

Sl. No	Article	Author	Source	Year
3	Modeling Clustering Approaches to Recommender Systems in Language Datasets	*Chen Wang*	Journal of Data Processing Vol: 15 No: 4	2025

Abstract: This paper proposes a novel approach to improving personalized recommendations in English resource libraries. Addressing challenges such as information overload, lack of personalization, cold start problems, and algorithmic complexity, the study leverages the K-means clustering algorithman unsupervised machine learning technique to group users and resources based on similarity. By transforming multidimensional resource attributes (e.g., topic, proficiency level, target audience) into onedimensional data via dimensionality reduction, the system improves storage, search, and recommendation efficiency. The model integrates user English proficiency data, processes it via dynamic multimodal modeling and principal component analysis, and clusters users for tailored suggestions. Experimental results demonstrate that the K-means based system outperforms traditional collaborative filtering in recommendation accuracy, although recall rates vary with list size. User activity data reveal consistent personalized recommendation usage (~40% daily peak) and search spikes at 15:00 and 21:00, likely reflecting student and working user learning patterns. The study concludes that the proposed method effectively enhances resource management and user satisfaction, ofering a scalable and efficient solution for digital English libraries. Future work includes refining algorithms to improve accuracy and user experience further.

Sl. No	Article	Author	Source	Year
1	LSTM-based Multi-channel Convolutional Autoencoder Model for Signal Optimization and Control Strategy	*Xiaojuan Che*	Digital Signal Processing and Artificial Intelligence for Automatic Learning Vol: 4 No: 4	2025

Abstract: The paper proposes a deep learning based approach to enhance the efficiency, stability, and control of hybrid renewable energy systems. It addresses challenges such as the intermittency and variability of sources like solar, wind, and geothermal energy, which hinder optimal energy utilization and grid stability. The study introduces an LSTM based multi channel convolutional autoencoder model that effectively extracts temporal and spectral features from system signals, improving prediction accuracy by 9.8% over traditional CNN models. The architecture combines convolutional neural networks (CNNs) for noise reduction and feature extraction with long short term memory (LSTM) networks for capturing temporal dependencies. Experimental results using real photovoltaic data from Shaoxing, China (2014â€“2018) demonstrate that the Conv LSTM model achieves superior performance across key metrics MAAPE, RMSE, and MAE especially for forecasting beyond 15 minutes. The research also highlights the importance of integrating environmental variables, such as temperature, which shows a correlation coefficient of 0.5539 with solar output. By leveraging advanced deep learning techniques, the system enables adaptive control strategies, demand forecasting, and optimized energy scheduling, ultimately improving economic viability and operational reliability. Despite its promise, the approach faces challenges in data collection, model interpretability, and real time deployment, pointing to directions for future research.

Sl. No	Article	Author	Source	Year
2	An Evaluation Network Model for Transport Development Risk Assessment	Guoqiang Li, Yinfa Wang	Digital Signal Processing and Artificial Intelligence for Automatic Learning Vol: 4 No: 4	2025

Abstract: The paper proposes an integrated safety assessment algorithm for road construction by combining the Analytic Hierarchy Process (AHP) and Back Propagation (BP) Neural Network. Traditional safety evaluation methods, such as fuzzy comprehensive evaluation, lack adaptability to dynamic environmental changes and struggle to update weights in real time. To address these limitations, the authors leverage AHP for systematic determination of indicator weights and the BP neural network for its strong nonlinear modeling, self-learning, and adaptive capabilities. Four key safety indicators geological disasters, hazardous sources, hidden dangers, and compliance with safety standards are selected for evaluation. The AHP method quantifies their relative importance using expert scoring and pairwise comparisons. At the same time, the BP neural network processes input data through a three-layer architecture to compute a safety risk coefficient. This coefficient maps to one of five predefined safety risk levels, enabling practical risk categorization. Experimental validation on a real infrastructure project demonstrates that the integrated algorithm significantly outperforms conventional approaches, achieving an average relative error of only 0.004 compared to 0.0468 for traditional methods. Results confirm the modelâ€™s high accuracy, reliability, and effectiveness in predicting safety risks. Despite its advantages, the authors acknowledge remaining limitations and call for further refinement to better align with public safety expectations. The study contributes a robust, data driven framework for improving safety management in complex road construction environments.

Sl. No	Article	Author	Source	Year
3	Enhancing Multi-Objective Educational Optimization for MOOC Flipped Models	*Min Zhang,Xiaoliang Sun*	Digital Signal Processing and Artificial Intelligence for Automatic Learning Vol: 4 No: 4	2025

Abstract: This paper explores enhancements to the Multi Objective Particle Swarm Optimization (MOPSO) algorithm to address challenges in educational optimization, particularly in intelligent and online teaching environments. It highlights the limitations of traditional teaching methods in applied universities and advocates integrating digital innovations such as MOOCs and flipped classrooms. The study focuses on improving MOPSOâ€™s ability to handle constrained, unconstrained, and partially constrained multi objective problems by enhancing particle selection, maintaining solution diversity, and avoiding local optima. The proposed AAD MOPSO algorithm demonstrates superior performance compared to IMOPSO and PCCSMOPSO, especially in maintaining highquality external archives and achieving better convergence and distribution on benchmark ZDT test functions (ZDT1â€“ZDT6). Experimental results show that AAD MOPSO accurately approximates the true Pareto front with improved uniformity and coverage. The paper concludes that advanced computational intelligence algorithms can support more effective educational strategies by optimizing complex, multi faceted objectivessuch as fostering studentsâ€™ moral development, critical thinking, and practical skills aligning with the needs of digital native learners. Ultimately, the research contributes a robust optimization framework applicable not only to education but also to other domains requiring efficient, multi objective decision making.

Sl. No	Article	Author	Source	Year
1	AI-Driven Electronic Vision for Formative Classroom Educational Assessment	*Qian Yang, Guoqiang Li*	Journal of Electronic Systems Vol: 15 No: 4	2025

Abstract: The paper explores the application of AI-driven computer vision to enhance formative assessment in classroom settings. It emphasizes how technologies such as face detection, face recognition, human pose estimation, and facial expression analysis can

objectively evaluate student engagement, attendance, and emotional states. The authors propose a multi column convolutional neural network architecture combined with sliding window fusion techniques to improve object and scene recognition accuracy. Experimental results on datasets like MNIST, MIT, and SUN397 demonstrate the modelâ€™s superior performance, achieving reduced error rates and enhanced generalization. The study concludes that integrating AI and computer vision into teaching evaluation provides richer, real time data for educators, supports pedagogical improvements, and enables more interactive and responsive classroom environments. Despite promising outcomes, challenges remain in data validity and system design, underscoring the need for further research to refine video based evaluation frameworks.

Sl. No	Article	Author	Source	Year
2	An Enhanced Architecture and Modularisation Strategies in Distributed Electronic Systems	Bing Xie	Journal of Electronic Systems Vol: 15 No: 4	2025

Abstract: The paper investigates the modular architecture of distributed electrical control systems to enhance their performance, reliability, and scalability. Unlike traditional centralized control systems, distributed systems divide control tasks among independent modules such as data acquisition, communication, and distributed control offering greater flexibility for complex industrial applications. The author reviews prior work in modular design techniques, communication technologies (e.g., Ethernet and wireless networks), and data processing methods, highlighting ongoing challenges in real time performance and system reliability. The study proposes a distributed design framework that integrates modularization strategies with optimized communication protocols and data transmission approaches. It also explores the application of intelligent algorithms including Support Vector Machines, neural networks, fuzzy logic, and data mining for system classification and pattern recognition. Experimental validation is conducted in real world engineering contexts, demonstrating improved voltage regulation, system stability, and classification accuracy. Results from iterative testing show effective convergence and enhanced model performance (e.g., RÂ² = 0.7237 in biomass estimation tasks). The paper concludes that thoughtful module design significantly boosts system effectiveness and provides practical guidance for engineering implementations. However, the author acknowledges remaining challenges and calls for further refinement of classification algorithms and experimental methodologies to ensure robustness and adaptability across diverse industrial environments.

Sl. No	Article	Author	Source	Year
3	Precision Error Removal in Smart Robotics Using 3D Machine Learning	Ruichun Gu	Journal of Electronic Systems Vol: 15 No: 4	2025

Abstract: The paper â€œError Correction Technology for Welding Robots Based on Three-Dimensional Visual Localizationâ€ by Ruichun Gu presents an innovative approach to improving welding accuracy by integrating 3D visual localization with welding robots. Traditional welding methods often suffer from seam deviations that compromise product quality. To address this, the study leverages 3D visual technologies such as laser scanning, structured light projection, and multi-sensor fusion to capture precise geometric data (position, shape, size) of weld seams in real time. This data enables immediate error detection and correction during the welding process. The research incorporates machine learning algorithms, particularly Support Vector Machines (SVMs), along with geometric features such as curvature and normal vectors, to classify and refine weld-seam data from 3D point clouds. Experimental results demonstrate high system accuracy, with a relative error of only 0.38% in seam distance measurements and endpoint positioning errors of 2.5-4 mmâ€” well within industrial tolerances. The study validates the method on crane main beams using COâ€š shielded robotic welding. Findings confirm that 3D visual localization significantly enhances welding precision, reduces defects, and improves production efficiency. The paper concludes that combining advanced visual sensing with intelligent algorithms offers a promising pathway for next generation welding automation, with potential for further integration of deep learning and real time adaptive control systems.

Sl. No	Article	Author	Source	Year
1	Backpropagation Artificial Intelligence with Grey System Theory	Guojun Hong, Wei Xiong	Information Security Education Journal Vol: 12 No: 2	2025

Abstract: The paper proposes an early warning system for corporate financial risk using an improved BP (Backpropagation) neural

network integrated with grey system theory. The author highlights the critical role of small and medium enterprises (SMEs) in China's economy and their vulnerability to financial distress due to poor financial management, inadequate internal controls, and external market pressures. To address this, a three layer Grey BP neural network model is constructed, featuring 16 financial input indicators, 9 hidden nodes, and 4 output categories representing different risk levels. The model is trained using financial data from 2000-2004 and validated with 2005-2006 data from 93 firms. Experimental results show high prediction accuracy, with an R-value exceeding 0.889, particularly for one year ahead (T-1) forecasts compared to two year ahead (T-2). The study concludes that the Grey BP neural network effectively identifies emerging financial risks, offering enterprise managers a reliable tool for proactive risk mitigation. Its adaptability, self learning capabilities, and minimal data requirements make it especially suitable for dynamic, complex economic environments. The research contributes to the growing body of work applying artificial intelligence to financial early warning systems and demonstrates the practical value of hybrid models that combine grey theory with neural networks for enhanced forecasting precision and generalization.

Sl. No	Article	Author	Source	Year
2	Recommender System Model for Security Teaching in the Higher Education System	*Jiang Jing*	Information Security Education Journal Vol: 12 No: 2	2025

Abstract: The paper proposes an intelligent secure education system tailored for college students using personalized recommendation technology. Recognizing the growing security challenges students face ranging from cybersecurity and traffic safety to mental health the system aims to enhance security awareness through customized learning content. It integrates user management, resource management, recommendation algorithms, and user interfaces into a cohesive architecture. Central to the system is a matrix factorization algorithm enhanced with techniques like multi head self attention and feed forward neural networks to analyze user behavior and recommend relevant educational resources. The system preprocesses diverse resource types (text, images, video) and extracts features using methods such as word embeddings and convolutional neural networks. Experimental evaluation compares an experimental group using the personalized system against a control group using traditional methods. Metrics like recommendation accuracy, recall, and user satisfaction are analyzed, with results indicating improved learning effectiveness and engagement. The

figures in the paper illustrate the impact of parameters, such as K, on recommendation performance and compare algorithm accuracy using metrics such as MAE. The study concludes that personalized recommendation systems significantly enhance secure education by aligning content with individual student needs, and it calls for further refinement through user feedback and advanced algorithms to address evolving security education demands.

Sl. No	Article	Author	Source	Year
3	A Study of the System Failures in the Network Security Using Information Processing	Bingjie Su	Information Security Education Journal Vol: 12 No: 2	2025

Abstract: The paper investigates common cause failures (CCFs) in secure computer operating systems using data mining techniques. As secure systems underpin critical sectors like government, defense, and healthcare, understanding and mitigating complex, interrelated failures stemming from hardware, software, or human errors is essential. The study proposes a novel Common Cause Failure Score to quantify and compare security performance across systems. Using association rule mining and decision tree algorithms (e.g., C5.0), the research uncovers hidden relationships among failure events. The Naive Bayes classifier is also employed to manage multidimensional data and categorize risk levels. Experiments involve preprocessing real world system failure data, applying statistical and machine learning models, and validating results using tools such as ROC curves and confusion matrices. Health Index (HI) modeling and life prediction techniques further assess system reliability over time. Findings demonstrate that integrating multiple data mining approaches enhances the accuracy of failure prediction, root cause analysis, and risk mitigation strategies. The study concludes that these methods significantly improve system stability, support informed decision making by administrators, and provide a robust framework for evaluating and selecting high performance, secure computing systems in complex network environments.

Sl. No	Article	Author	Source	Year
1	Mitigating Intersectional Gender and Racial Bias in Sentiment Analysis: A T5-Based Data Augmentation Approach for English and Low-Resource Bengali	*Md Saiful Islam*	Journal of Digital Information Management Vol: 23 No: 4	2025

Abstract: This paper analyzes the performance of a UAV-enabled backscatter communication system for low power IoT networks. The system consists of a power beacon that wirelessly energizes an energy constrained source node, which then transmits data to a UAV-mounted backscatter relay; the UAV reflects the signal to a destination. A realistic composite fading model is adopted: Rician fading for UAV-involved links (source-to- UAV and UAV-to-destination) to account for dominant line of sight (LoS) components, and Rayleigh fading for the ground based power beacon to source link due to shadowing. The main contribution is the derivation of an exact closed form expression for the system's outage probability using the Meijer G-function, enabling efficient performance evaluation without extensive simulations. The analysis incorporates a time switching protocol where the source alternates between energy harvesting and data transmission. Numerical results validate the analytical model and reveal critical insights: outage performance improves significantly with higher Rician K-factors (indicating stronger LoS), and an optimal time switching ratio exists that minimizes outage by balancing energy harvesting and data transmission durations. Additionally, hardware parameters such as backscatter coefficient and energy conversion efficiency strongly influence system reliability. The study also highlights the trade off between target data rate and outage probability, showing that higher beacon transmit power supports higher data rates at fixed reliability levels. These findings provide practical guidance for designing efficient UAV-assisted backscatter IoT systems.

Sl. No	Article	Author	Source	Year
2	Can AI Replace Human Peer Reviewers? A Comparative Analysis of AI-Generated and Human Expert Reviews	*Pit Pichappan, Preethi Pichappan*	Journal of Digital Information Management Vol: 23 No: 4	2025

Abstract: This work analyses the performance of AI-generated peer reviews compared to human expert reviews across 62 manuscripts in the Real-Time Intelligent Systems track of the Springer Lecture Notes in Networks and Systems. Using four large language models ChatGPT 3.5, Perplexity AI, Qwen-3 Max, and DeepSeek the study evaluated 141 reviews using both AI and human reviews against 12 quality criteria, scored by five domain experts. Results show human reviews scored higher overall (mean = 3.98 vs. 3.15 for AI) with greater consistency and depth, particularly in methodological critique, literature contextualisation, and review confidence. AI reviews were more generic and less specific, struggled with scholarly subtlety, though they excelled at summarisation and formatting checks. While the difference approached statistical significance ($p = 0.08$), the effect size (Cohen's $d = 0.56$) indicated a moderate practical gap. The study concludes AI cannot replace human reviewers but may ethically augment the process in hybrid models under human oversight.

Sl. No	Article	Author	Source	Year
3	Analyzing Outage Performance in a UAV-Assisted Backscatter System Operating under Realistic Composite Fading Conditions	*Lam Dong Huynh, Lam Thanh Tu, Tan N. Nguyen*	Journal of Digital Information Management Vol: 23 No: 4	2025

Abstract: This paper analyzes the performance of a UAV-enabled backscatter communication system for low power IoT networks. The system consists of a power beacon that wirelessly energizes an energy constrained source node, which then transmits data to a UAV-mounted backscatter relay; the UAV reflects the signal to a destination. A realistic composite fading model is adopted: Rician

fading for UAV-involved links (source-to- UAV and UAV-to-destination) to account for dominant line of sight (LoS) components, and Rayleigh fading for the ground based power beacon to source link due to shadowing. The main contribution is the derivation of an exact closed form expression for the system's outage probability using the Meijer G-function, enabling efficient performance evaluation without extensive simulations. The analysis incorporates a time switching protocol where the source alternates between energy harvesting and data transmission. Numerical results validate the analytical model and reveal critical insights: outage performance improves significantly with higher Rician K-factors (indicating stronger LoS), and an optimal time switching ratio exists that minimizes outage by balancing energy harvesting and data transmission durations. Additionally, hardware parameters such as backscatter coefficient and energy conversion efficiency strongly influence system reliability. The study also highlights the trade off between target data rate and outage probability, showing that higher beacon transmit power supports higher data rates at fixed reliability levels. These findings provide practical guidance for designing efficient UAV-assisted backscatter IoT systems.

Sl. No	Article	Author	Source	Year
1	A Cloud- based Data Processing Platform for the Internet of Things Architecture,Implementation, and Performance Evaluation	*Xia Peng*	International Journal of Web Applications Vol: 17 No: 4	2025

Abstract: The paper presents a cloud-based data processing platform for the Internet of Things (IoT), designed to handle the collection, storage, processing, and visualization of sensor data. It leverages cloud computing to address the challenges posed by the massive volumes of data generated by IoT devices, utilizing scalable technologies like Hadoop and Hive for distributed storage and Map Reduce based analytics. The system architecture includes a TCP server module built with PHP and the Swoole extension to manage real time sensor data ingestion, and a middleware layer based on Redis to decouple components and enable efficient inter module communication. The platform offers two primary external interfaces: one for task execution (via Hive) and another for data uploading to HDFS. Performance tests on the TCP server show high data processing efficiency at low concurrency, with performance degrading beyond 500 concurrent connections still sufficient for most real world IoT scenarios where data acquisition rates are lower.

The Hadoop cluster demonstrates robust functionality, including dynamic node addition/removal without service interruption. While domestic IoT analytics platforms in China lag behind global counterparts, this work contributes a customizable, open framework that supports secondary development and real time monitoring. The authors conclude that the platform meets typical production needs and suggest future improvements in API design and developer usability to lower the barrier for customization and deployment.

Sl. No	Article	Author	Source	Year
2	Integrating Digital Technology into Modern Ceramic Art: Enhancing Creativity, Design, and Cultural Expression	*Ma Jifei*	International Journal of Web Applications Vol: 17 No: 4	2025

Abstract: This paper explores the integration of digital technology into modern ceramic art, emphasizing its transformative potential in design, production, and creative expression. It begins by highlighting Chinaâ€™s historical prominence in ceramics but notes that contemporary Chinese ceramic art lags behind global standards due to limited innovation and underutilization of digital tools. While industries like automotive and fashion have embraced digital advancements, ceramic art remains largely reliant on traditional, manual techniques. The paper discusses how software such as 3ds Max and Photoshop can enhance ceramic design through 3D modeling, glaze simulation, and decorative pattern creation, offering greater efficiency, accuracy, and creative flexibility compared to conventional methods. Applications span functional ceramics, environmental ceramic installations, and artistic decoration, with digital renderings facilitating better communication, visualization, and ecological integration. The study underscores the need for Chinese ceramic artists to adopt digital technologies to bridge the gap with international counterparts, preserve cultural heritage, and meet modern aesthetic and market demands. Ultimately, the fusion of traditional ceramic practices with digital innovation is presented not as a replacement but as a vital evolution, enabling richer artistic expression, sustainability, and global competitiveness in ceramic art. The conclusion affirms that digital technology serves as both a practical tool and a source of creative inspiration, essential to the future development of the discipline.

Sl. No	Article	Author	Source	Year
3	Preserving Conservation Cultural Materials with AI: A Human Pose Estimation Approach	*Zhijiang Lan*	International Journal of Web Applications Vol: 17 No: 4	2025

Abstract: This paper explores how deep learning can be leveraged to preserve and promote traditional Chinese martial arts, which are a vital part of Chinaâ€™s intangible cultural heritage. Historically transmitted through master apprentice relationships, these arts now face challenges due to societal modernization and demographic shifts. The author proposes using deep learning models particularly convolutional neural networks (CNNs) to capture, analyze, and reconstruct martial arts movements through human pose estimation. A novel model, IPN (Involution Pose Estimation Net), built on Simple Baselines and Involution mechanisms, is introduced to identify key body joints from video data with high accuracy. The study utilizes datasets like NTURGB+D and UTD-MHAD, though it acknowledges their limitations for martial arts specific actions, highlighting the need for a dedicated Chinese martial arts motion database. Evaluation metrics such as tMPJPE (time aware Mean Per Joint Position Error) are adapted to assess pose accuracy over time. Experimental results demonstrate effective movement recognition in â€œYouth Serial Boxing,â€ with promising convergence and accuracy. The research underscores deep learningâ€™s potential not only in digitizing martial arts but also in enabling broader cultural preservation in the intelligent era. Future work includes expanding the model to other martial arts styles and improving dataset specificity to enhance training and generalization.