## Machines and Algorithms

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Editorial

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## From the Editor

I feel pleasure in publishing this issue of the Machines and Algorithms journal, which is designed by keeping in view the interests of the audience in the theoretical and applied fields of Computer Science, i.e., Artificial Intelligence, Machine Learning, Generative AI, Image Processing, Algorithmic Optimization, Blockchain, Smart Environment, IoT, Quantum Computing, Distributed and Parallel Computing, Ubiquitous and Pervasive Computing, and other cutting-edge technologies that shape the future of computing.

In this issue, high-quality research articles are carefully compiled after a thorough peer-review process. We extend our gratitude to the authors for their valuable contributions and to the reviewers for their diligent efforts in maintaining the journal's academic rigor. A shorts overview of the papers included in this issue is given below.

The "Artificial Intelligence and Machine Learning in Hospital Waste Management" explores the integration of Artificial Intelligence (AI) and Machine Learning (ML) in hospital waste management, highlighting their potential to transform traditional practices. A systematic literature review was conducted using databases like PubMed, Scopus, and Web of Science, yielding 50 relevant articles from 2020–2023. The new feature is in describing AI/ML applications include intelligent monitoring via IoT, predictive analytics for waste generation forecasts, and automated waste sorting using CNNs. These developments increase sustainability, lower human error, and raise classification accuracy. Results indicate that kernelbased and neuron-based models outperform traditional methods in accuracy and efficiency. The paper also addresses key limitations such as data privacy, lack of annotated datasets, and integration issues with legacy systems. Future directions include developing advanced algorithms (e.g., federated learning and GANs) and integrating AI with IoT and blockchain to enable real-time tracking, data transparency, and scalable deployment in healthcare facilities.

The "Selecting Suitable Requirement Elicitation Technique for Development Methodologies" paper introduces a novel, systematic approach for selecting requirement elicitation techniques (RETs) tailored to specific software development projects. Unlike traditional arbitrary selection based on past experience, the proposed method leverages both qualitative and quantitative analyses, primarily using multiple linear regression and classification models to identify key project attributes influencing RET choice. The methodology involves gathering requirements from different domains, selecting significant project, people, and product attributes, and applying regression analysis to predict the most appropriate elicitation methods. The framework supports a variety of development methodologies, including web-based, mobile, and desktop projects. Results demonstrate that techniques such as interviews, focus groups, workshops, observation, and prototyping are optimal depending on project type and constraints. The study highlights the potential for future incorporation of machine learning and AI to enhance selection accuracy and adaptability, addressing current gaps in automated, context-aware elicitation techniques. This method decreases reliance on opinion and strengthens both requirement clarity and comprehensive content.

The "A Data-Driven Study of Mental Health Trends in the Tech Industry: Statistical and Machine Learning Perspectives" project offers a comprehensive data-driven analysis of mental health trends in the global IT sector by means of statistical methods and machine learning models. The research approach

integrates data exploration with feature modification alongside predictive modeling to determine mental health influences on information technology workers that include worker demographics and both personal and working environment factors. The research stands out by analyzing mental health data across multiple countries together with workforce behaviors regarding treatment-seeking hence identifying major demographic and regional patterns which show higher treatment participation in New Zealand and Australia. A new predictive system employs Naïve Bayes classifiers because they analyze ROC curves and confusion matrices to successfully diagnose mental health issues while monitoring workplace mental well-being. The research recommends solutions through a dual focus on efficient model performance that enables workplace leaders to detect and create supportive environments for employee mental health in the stressful tech industry.

The study "Rule-Based Capitalization Algorithm Using NLP for Text Formatting Consistency" demonstrates use of NLP techniques with rule-based capitalization to achieve consistent text formatting within books and academic works and headlines. NLTK and SpaCy tools enable the system to separate words into two categories including notional types (nouns, verbs and adjectives) and non-notional categories (articles and prepositions) through tokenization and part-of-speech (POS) tagging. The program follows linguistic accuracy while its programmed rules ensure the correct formatting in title case. The system uses NLP with pre-programmed reasoning guidelines to pursue exact capitalization with greater success than generic heuristic approaches and online translation tools. The research findings demonstrate high accuracy which was verified through the assessment of precision, recall and F1 score indicating low error rates in system reliability happens through text reconstruction processes along with exception handling mechanisms. This paper describes how text reconstruction along with exception management leads to improved algorithm performance and affects automated publishing and content standardization.

A comprehensive breakdown of false news detection through machine learning (ML) and natural language processing (NLP) techniques exists in the "Fake News Detection using NLP and ML Techniques" paper that analyzes the Kaggle dataset of 40,000 news stories. The paper incorporates Naïve Bayes and Decision Trees alongside Random Forest with ensemble models XGBoost and CatBoost alongside neural network component LSTM as key ML Algorithms. This research presents the main outcome through a performance analysis which confirms ensemble learning algorithms and deep learning methods outperform traditional classifiers when measuring accuracy and recall rates. The validation results of XGBoost achieved 92% while CatBoost demonstrated strong recall capabilities which establishes their effectiveness in identifying false news. The research reveals that TF-IDF vector extraction overcomes simple tokenization as a necessary feature extraction technique. Through systematic algorithm assessment the paper both advocates a successful NLP-ML hybrid method and presents future directions for false news detection enhancement through different feature representations and validation techniques which enhance the field of knowledge.

Our team is highly committed and works hard to ensure that Machines and Algorithms continues to publish quality research articles. Looking ahead, we aim to expand the journal's reach, collaborate with leading research institutions, and introduce special issues on emerging topics. Your feedback and participation are invaluable in shaping the future direction of Machines and Algorithms.

Thank you for your continued support. We hope this issue meets your expectations.