Special Issue Reprint

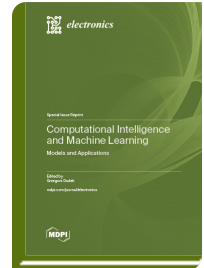# Computational Intelligence and Machine Learning: Models and Applications

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Edited by
Grzegorz Dudek

This Special Issue presents a curated collection of ten research articles that reflect current trends and challenges in computational intelligence and machine learning. The selected works cover a broad spectrum of methods and applications, including personalized recommendation systems, social-aware filtering, human motion prediction, automatic speech recognition for under-resourced languages, chatbot frameworks for Arabic natural language understanding, anomaly detection in system logs, and meteorological forecasting. Across these contributions, several themes emerge. Many studies explore the integration of advanced learning architectures, such as transformers, graph neural networks, and retrieval-augmented generation, with domain knowledge to improve performance and generalization. Others focus on addressing practical challenges like data sparsity, bias in AI systems, and the need for lightweight models suitable for low-resource settings. The application domains span travel, healthcare, e-commerce, software engineering, and environmental monitoring, demonstrating the wide-ranging impact of modern AI techniques. Collectively, the papers emphasize not only technical effectiveness but also the importance of interpretability, fairness, and adaptability in real-world deployments. They exemplify the shift toward responsible and context-aware machine learning and offer methodological insights that are relevant for both academic research and industrial innovation.

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