Special Issue

Applied Machine Learning in Industry 4.0

Message from the Guest Editors

The Fourth Industrial Revolution is transforming decision-making in data-rich domains through advanced machine learning (ML) and foundation models. This Special Issue explores domain-constrained intelligence—systems that integrate domain-specific knowledge (e.g., ontologies, rules) with adaptive learning. Innovations include domain-adapted transformers, vertical decision engines, multimodal RAG systems combining structured and unstructured data, and self-optimizing frameworks using real-time feedback. We highlight human-AI co-reasoning, where large language models (LLMs) operate within domain rule constraints. Submissions should validate knowledge integration, assess expert input, and address challenges such as generalization vs. specificity, multimodal semantic alignment, and cognitive workflow optimization. We seek reproducible case studies in areas like LLM-based threat simulation, compliance reasoning, and multimodal decision support. Desired outcomes include auditable decisions, causal reasoning, and privacy-preserving learning. This collection aims to advance trustworthy, domain-informed decision ecosystems.

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Message from the Editor-in-Chief

As the world of science becomes ever more specialized, researchers may lose themselves in the deep forest of the ever increasing number of subfields being created. This open access journal Applied Sciences has been started to link these subfields, so researchers can cut through the forest and see the surrounding, or quite distant fields and subfields to help develop his/her own research even further with the aid of this multi-dimensional network.

Editor-in-Chief

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