Special Session Proposal

Title: "General Rough Set Perspectives on the Foundations of AI and Machine Learning"

Organizers:
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General rough sets have rich foundations that span across algebraic, topological, logical, computational, knowledge representation, and mereological domains. The fields of artificial intelligence, in particular machine and deep learning, and generative AI large corpus based systems (frequently referred to as LLMs) have generated a wide array of problems relating to their reliability, explainability (in any sense), sustainability, and generalizability, among others. Further, their application to fields such as chemistry, molecular biology, education, physics, and social media suggest newer directions of research. The session is intended to discuss novel proposals on addressing these problems through general rough sets (of different aetiologies), 3-way decision-making, approximate reasoning, and granular computing.

Papers submitted to the session are expected to be substantially about foundational models, and explain their applicability in sufficient depth. The session will feature invited (with scope for detailed commentaries) and contributed talks. All researchers working on theoretical or meaningful practical applications in related areas are additionally encouraged to submit their

papers and participate. A special issue of a leading journal devoted to extensions of the papers submitted to the session is planned.

Topics:

Topics of interest (but not necessarily limited to) include:

Logico-Algebraic Models of Approximate Reasoning

Explainable AI

LLMs and Rough Sets

Three Way Decision-Making

Foundations of Soft Clustering

Pure Models from Applications

Models of Intrusion and Contamination

Rough Mereologies and AI

Models of Transfer Learning

Statistical Learning and Rough Sets

Granular Computing

Aggregation Based Models

Discrete and Topological Dualities

Clean Rough and Nonstochastic Randomness

Connections Between Different Soft Theories

Hybrid Models

Models for Radical AI

Algorithmic Roughness
