INTERNATIONAL

INVITED SESSION SUMMARY

Title of Session:
Reasoning-Based Intelligent Applied Systems

Name, Title and Affiliation of Chair:

Prof. Dr. Jair Minoro Abe
Paulista University (UNIP) – Graduate Program in Production Engineering (PPGEP-UNIP)
São Paulo, Brazil
Email: jair.abe@docente.unip.br

Details of Session (including aim and scope):

Session Description

Reasoning-Based Intelligent Applied Systems (RIAS) represent an advanced integration of **logical reasoning** and **computational intelligence** to address complex, dynamic problems across a wide range of domains. These systems combine artificial intelligence techniques—such as **machine learning**, **rule-based inference**, and **natural language processing**—with **formal logical frameworks** that support structured and context-aware decision-making.

A defining characteristic of RIAS is its ability to process and interpret large volumes of heterogeneous data, evaluate conditions, and produce adaptive, goal-oriented decisions or predictions. Their embedded reasoning mechanisms allow for effective handling of **uncertainty**, **inconsistency**, and **incompleteness** in data, providing a robust and interpretable alternative to purely statistical or heuristic models.

This invited session offers a multidisciplinary platform for exchanging ideas, theoretical approaches, and practical applications of intelligent systems founded on **non-classical logics**. We particularly welcome research that explores **paraconsistent**, **paracomplete**, **non-alethic**, and other **non-classical reasoning frameworks**, addressing real-world challenges in which information is imprecise, conflicting, or incomplete.

Topics of Interest

Topics include, but are not limited to:

- Non-classical Logic-based Intelligent Systems
- Industrial and Commercial Applications of Reasoning-Based Systems
- Intelligent Control Systems Founded on Non-classical Logic
- Cybersecurity and Cybernetic Systems under Non-classical Reasoning
- Generative Artificial Intelligence and Non-classical Logic Integration
- Logistics, Automation, and Robotics with Non-classical Reasoning Approaches

- Intelligent Information Systems and Advanced Machine Learning with Logical Foundations
- Non-classical Logic Programming and Applied Reasoning in Intelligent Systems
- Theoretical Foundations and Applications of Non-classical Logics
- Soft Computing Techniques in Reasoning-Based Technologies
- Logic-based Intelligent Systems for Production Engineering and Related Fields
- Applications in Bioinformatics and Biomedical Engineering
- Web Intelligence and Semantic Reasoning
- Non-classical Logic-based Systems for Industry 4.0 and Society 5.0

Keywords

Non-classical Logic; Paraconsistent Logic; Intelligent Systems; Reasoning-based Computing; Artificial Intelligence; Decision Support Systems; Uncertainty; Knowledge Representation.

Justification for the Session

This invited session will bring together researchers and practitioners working at the intersection of **logic, artificial intelligence, and applied reasoning**. The focus on non-classical logic-based systems responds to the growing need for explainable, **reliable AI** in uncertain or contradictory contexts. By fostering dialogue between theoretical and applied perspectives, the session aims to advance intelligent systems capable of **robust decision-making**, **resilient knowledge representation**, and **context-aware automation**—key challenges in Industry 4.0 and Society 5.0 frameworks.

Main Contributing Researchers / Research Centres (tentative, if known at this stage): Universities and Research Centers AI and Knowledge Engineering Research Units from Academia and Industry Collaborators
Website URL of Call for Papers (if any):
Email & Contact Details: **Prof. Dr. Jair Minoro Abe** Paulista University (UNIP) – Graduate Program in Production Engineering (PPGEP-UNIP) São Paulo, Brazil Email: jair.abe@docente.unip.br