UNIVERSITA` CAMPUS BIO-MEDICO DI ROMA

Unità di Sistemi di Elaborazione e Bioinformatica (CoSBi)

Seminario

Bridging Knowledge Representation and Reasoning Modeling in Biomedical Research

Krzysztof Pancerz is an associate professor at the Department of the Foundations of Computer Science at the John Paul II Catholic University of Lublin. He holds an MA in electrical engineering from Rzeszów University of Technology, and a PhD and habilitation (postdoctoral degree) in computer science from the Institute of Computer Science, Polish Academy of Sciences in Warsaw. His research interests include artificial intelligence, machine learning, ontologies and semantic data analysis, computer-assisted medical diagnosis, and unconventional computing. His particular focus is on incorporating knowledge, in the form of ontologies, into machine learning methods.

Piotr Kulicki is a full professor of philosophy at the Department of Computer Science Foundations at the John Paul II Catholic University of Lublin (KUL). He studied philosophy at KUL and computer science at the University of Oxford. He holds a PhD and habilitation (postdoctoral degree) in philosophy (logic) from KUL. His areas of interest include logic, knowledge representation in information systems, and artificial intelligence. He has led and participated in projects on knowledge representation in the agri-food, automotive, legal, and quantum information processing domains. He is the director of the Centre for Human-Oriented Artificial Intelligence at KUL.

Abstract:
In this seminar, we will explore the significance of ontologies in biomedical research and their integration with reasoning models. The presentation will begin with an introduction to ontologies, which are structured frameworks for the formal representation of knowledge in a specific domain. Ontologies define concepts, properties, and relationships, promoting standardization and supporting information system design and knowledge discovery through ontology-based reasoning mechanisms. We will demonstrate the development and application of ontologies, showcasing examples from the biomedical field. The second part of the seminar will focus on the integration of ontologies into reasoning process models, with a particular emphasis on Petri nets and flow graphs. These models, known for their ability to describe real-life processes, will be enhanced by the incorporation of ontological structures. This integration combines the strengths of graphical and formal tools for modeling dynamic processes with the specificity of ontologies, which define domain-specific vocabularies. This approach aligns with current trends in artificial intelligence, including symbolic AI, explainable AI, and computing with words, offering a comprehensive framework for reasoning and decision-making in biomedical contexts.

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Aula R22 14:30 – 15:30

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