



Conscious AI Systems

**Prof. Antonio Chella,
Director of the RoboticsLab,
University of Palermo (Italy)**

6 Maggio 2025, ore 10:00, Aula TBD
University Magna Graecia of Catanzaro

Abstract

The creation of conscious AI systems represents one of the most fascinating technical challenges in artificial intelligence, bridging deep learning architectures with embodied cognition and computational models of consciousness. This interdisciplinary research field has evolved beyond philosophical debates into concrete implementation approaches with dual objectives. Researchers are developing computational frameworks inspired by biological consciousness to create AI systems with awareness capabilities, while simultaneously using these implementations to validate and refine our theoretical understanding of consciousness.

This research program integrates cutting-edge approaches from neural networks to cognitive architectures, from reinforcement learning in embodied agents to neuro-symbolic integration, from developmental learning to predictive processing and bio-inspired computing. Recent advances in foundation models and large language models have opened new perspectives on emergent properties that might relate to conscious AI systems, while neuroscience findings continue to inform the computational requirements for conscious processing in AI systems. The seminar will present state-of-the-art architectural frameworks, computational models, and experimental implementations in conscious AI systems research. Through technical analysis of case studies, we will examine how different AI approaches address key aspects of consciousness such as self-modeling, phenomenal experience, and metacognition. The discussion will be particularly relevant for researchers working at the intersection of deep learning, cognitive architectures, and embodied AI.

Short bio

Antonio Chella is a Professor of Robotics at the University of Palermo, Italy, and the Director of the Robotics Lab at the Department of Engineering at the same University. He is a former Chair of the Department of Computer Engineering and of the Interdepartmental Center of Knowledge Technology. The primary research expertise of Prof. Chella is on robot consciousness, robot theory of mind, cognitive robotics, and robot creativity. Prof. Chella is the author of more than 200 scientific publications. He is a senior fellow of the "Accademia Nazionale di Scienze, Lettere e Arti" (the Italian national academy of science, humanities, and arts). He received the James S. Albus Medal award of the BICA Society (Biologically Inspired Cognitive Architectures) for the outstanding contribution to the science of BICA. He is a co-author of the book "Artificial Consciousness" (Imprint Academic, 2007), considered a reference in the field. Prof. Chella has been the PI for several projects from the Italian Ministry of Research (MIUR), the National Scientific Council (CNR), the Italian Space Agency (ASI), the European Union, the US Air Force Office of Scientific Research. Prof. Chella's research activities have been the subject of many articles and interviews in national and international magazines and newspapers, including The New York Times, New Scientist, and The Guardian.

Contacts: Prof. Mario Cannataro, email: cannataro@unicz.it, tel: 0961-3694100