ROBOTICS ENGINEERING COLLOQUIUM SERIES

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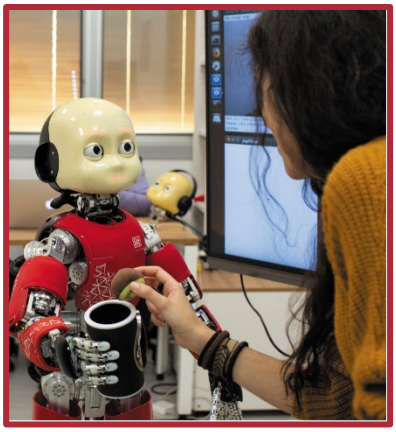
Cognitive Robotics for Human-Robot Interaction

Friday, October 09, 2020
12:00 pm – 1:00 pm
Zoom link: https://wpi.zoom.us/j/95199105857 (sign-in required)



Abstract: For robots to become an effective component of our society, it is necessary that these agents become primarily cognitive systems, endowed with a cognitive architecture that enables them to adapt, predict, and pro-actively interact with the environment and communicate with the human partners. Human communication depends on mutual understanding: I know how to communicate because I entertain a model of you, which enables me to select an effective way to convey to you what I want and to have an intuition of your internal states – what you need, fear or desire. Such intuition enables me to perceive properties that would be otherwise not accessible to my perception, as goals, emotions or effort. Our contribution to the roadmap toward cognitive systems leverages on the use of a humanoid robot (iCub) to test some of our assumptions on how to build a cognitive interactive agent. We attempt at modeling the minimal skills necessary for cognitive development, focusing on the visual features that enable to recognize the presence of other agents in the scene, to allow action matching across different visual perspectives and to foster automatic speed adaptation in human-robot interactive repetitive tasks. In a dual approach, we are trying to understand how to modulate robot behavior to elicit better human understanding and to express different characteristics of the interaction: from the mood to the level of commitment. This approach is propaedeutic to the creation of a cognitive system, by helping in the definition of what is relevant to attend to, starting from signals originating from the intrinsic characteristics of the human body. We believe that only a structured effort toward cognition will in the future allow for more humane machines, able to see the world and people as we do and engage with them in a meaningful manner.

Bio: Alessandra received her Ph.D. in Humanoid Technologies from the University of Genova (Italy) in 2010. After a Post Doc at the Italian Institute of Technology (IIT) and two research periods in USA and Japan, she became the scientific responsible of the Cognitive Robotics and Interaction Laboratory of the RBCS Dept. at IIT. After being Assistant Professor in Bioengineering at DIBRIS University of Genoa, she is now Tenure-Track Researcher at the Italian Institute of Technology, head of the COgNiTive Architecture for Collaborative Technologies (CONTACT) unit. In 2018 she has been awarded the ERC Starting Grant wHiSPER, focused on the investigation of joint perception between humans and robots. She

published more than 60 papers and abstracts and participated in the coordination of the CODEFROR European IRSES project. She is an Associate Editor of Robots and Autonomous Systems, Cognitive Systems Research and the International Journal of Humanoid Robotics and she has served as a member of the Program Committee for the International Conference on Human-Agent Interaction and IEEE International conference on Development and Learning and Epigenetic Robotics. The scientific aim of her research is to investigate the sensory and motor mechanisms underlying mutual understanding in human-human and human-robot interaction.

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