May 22, 2023
17:00-20:00 (CEST)
Taormina, ME (IT)

The Science of Consciousness
TSC 2023
Workshop

THE ROLE OF EMBODIMENT IN SELF-AWARE HUMANS AND ROBOTS

Given the deep and complex nature of consciousness and, in general, what is related to self-awareness, the endeavor to simplify and implement such phenomena on artificial agents may likely result in severe reductionism. Nevertheless, too high is their relevance for artificial embodied systems. Autonomous control and behaviors, fluent and effective interaction with the environment, as well as meaningful and trustworthy relations with humans, require robots to have a sense of self. Hence, the impasse calls for interdisciplinary research and respectful comprehension of other perspectives. This workshop wants to gather different approaches – from neurosciences, robotics, and philosophy – concentrating attention on the role of the body in self-awareness. The body is the core of identity, personal history, and interaction with the external world. Also, albeit different in its nature, it makes robots more comparable to humans. At the intersection of different disciplines, this workshop aims to emphasize the importance of the topic, show recent developments, and promote further collaborative research.

17:00	Prof. G. Sandini	Workshop Opening
17:10	Prof. S. Gallagher	Idem and Ipse Identity in Robots
17:40	Prof. M. Asada	Development of Self-Awareness in Humans and Robots
18:10	*Coffee Break*	
18:20	Prof. R. Chatila	Self-Aware Robots: A constructivist Approach
18:50	Dr. S. Sarasso	Consciousness in the Absence of Behavior: a Neuro-physiological Account
19:20	*Roundtable*	Chair Dr. Carlo Mazzola
20:00	End of Workshop	

DETAILED PROGRAM

17:10 Prof. Shaun Gallagher University of Memphis (USA)
University of Wollongong (AU)

Bio Shaun Gallagher, PhD, Hon DPhil., is the Lillian and Morrie Moss Professor of Excellence in Philosophy at the University of Memphis, and Professorial Fellow at the School of Liberal Arts, University of Wollongong (AU). He was a Humboldt Foundation Anneliese Maier Research Fellow (2012-18) and has held Honorary Professorships at Tromsø University (Norway); Durham (UK) and Copenhagen (DK), as well as visiting positions at Cambridge, Lyon, Paris, Berlin, Oxford and Rome. His areas of research include phenomenology, philosophy of mind, embodied cognition, social cognition, and concepts of self. He is editor-in-chief of the journal Phenomenology and the Cognitive Sciences.

Idem and Ipse identity in robots

The distinction between idem and ipse identity is proposed by Paul Ricoeur to characterize two aspects of self-identity. The distinction responds, respectively, to the questions of reidentification – what makes someone the same from one time to another? – and characterization – what makes someone who she is? On a widely shared view, the physical body is proposed as the answer to the question of reidentification (idem identity); and narrative is proposed as the answer to the question of characterization (ipse identity). On the face of it, there seems no reason not to apply such answers to questions about self-identity in the case of robots. I raise some complicating issues, however, and suggest that body and narrative are not sufficient for either idem or ipse identities, and this applies to both humans and robots.

17:40 Prof. Minoru Asada International Professional University of Technology in Osaka (JP)
SISReC, Osaka University (JP)

Bio Professor Minoru Asada received Ph.D. in control engineering from Osaka University in 1982. Since 1997, he has been a Professor of the department of Adaptive Machine Systems at the Graduate School of Engineering, Osaka University. He was the president of the International RoboCup Federation (2002-2008) and was the Research Director of "ASADA Synergistic Intelligence Project" of ERATO (2005-2012). In 2012, the Japan Society for Promotion of Science (JSPS) named him to serve as the Research Leader for the Specially Promoted Research Project (Tokusui) on Constructive Developmental Science Based on Understanding the Process From Neuro-Dynamics to Social Interaction. Since 2018, he has been the administrative director of Symbiotic Intelligent Systems Research Center at the Institute for Open and Transdisciplinary Research Initiatives, Osaka University.

Development of Self-Awareness in Humans and Robots

Our fMRI studies found that self-face recognition and proprioception in humans develop from school children to young adults changing the regions of brain activities that indicates the differences in the way of self-awareness during the development process. In case of robots, artificial pain may have a role of self-awareness development, and we discuss how humans and robots can share the developmental process of self-awareness.

18:20 Prof. Raja Chatila   ISIR, Sorbonne University (FR)

Bio Raja Chatila is Professor Emeritus of Artificial Intelligence, Robotics and IT Ethics at Sorbonne University in Paris. He is former director of the SMART Laboratory of Excellence on Human-Machine Interactions, of the Institute of Intelligent Systems and Robotics (ISIR) in Paris, and of Laboratory of System Analysis and Architecture (LAAS-CNRS) in Toulouse, France. He is author of about 180 publications on autonomous robotics, perception, human-robot interaction, machine Learning, cognitive architectures, and AI ethics. He is chair of the IEEE Global Initiative on Ethics of Autonomous and Intelligent Systems, co-chair of the Responsible AI working group of the Global Partnership on AI and member of the French National Pilot Committee on Digital Ethics (CNPEN). He is past president of the IEEE Robotics and Automation Society (2014-2015), IEEE Fellow and recipient of the IEEE Robotics and Automation Society Pioneer Award.

Self-Aware Robots: A constructivist Approach

Self-awareness is an ill-defined concept. We aim to try to investigate if we can frame it and understand it from a computational perspective. Our rationale is that there is an intricate relationship between an agent's self-awareness, and the interaction between the "mind-body" of this agent and its environment. That the understanding of its environment by the agent requires self-awareness, which actually develops as a result of this understanding and the distinction that the agent is capable to make between itself and its environment. The approach is to construct and experiment mechanisms and systems integrated in a global architecture, that would enable robots to understand their environment semantically through affordances, to interact with other agents, to be able to decide on their own and to be cognizant of what they do, to learn from their own experience, and to know what they have learned.

18:50 Dr. Simone Sarasso   University of Milan (IT)

Bio Dr. Simone Sarasso (PhD), MSc in Psychology (2004), PhD in Psychological Sciences - Psychobiology (2008). He is currently Associate Professor of Human Physiology at the University of Milan. As a postdoc he spent four years at the Department of Psychiatry of the University of Wisconsin - Madison under the supervision of Prof. Giulio Tononi. He subsequently joined the group of Dr. Marcello Massimini at the University of Milan where he was appointed Assistant Professor in 2014. His main research interests are the neural correlates of consciousness, sleep neurophysiology and cortical synaptic plasticity investigated by means of high-density EEG and TMS in healthy as well as in psychiatric and neurological populations.

Consciousness in the Absence of Behavior: a Neurophysiological Account

Consciousness is a fundamental property of living organisms which are embodied and engage with their surroundings. However, several conditions -from dreaming to functional and/or structural pathological alterations of the neural physical substrate- suggest that human consciousness can be preserved in the absence of interactions with both the body and the environment. These conditions challenge the functionalist approach to evaluating consciousness and, taken to the extreme, they question the body as necessary for consciousness, suggesting the existence of islands of awareness. Here, I will introduce a theory-inspired, neurophysiological approach to evaluate consciousness independently of sensory processing and behavior. I will discuss the ethical and practical implications of this approach, as well as its potential impact on outstanding debates surrounding the role of the body in the emergence of consciousness in both biological and artificial systems.
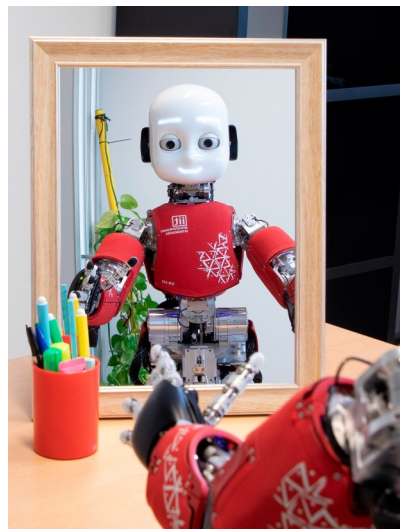
Visit the [workshop website here](#), you can post your questions for the roundtable!