



Inner Speech in Humans and Robots

Rubino Hall, Viale delle Scienze, building 8

June 6, 2019

09:00 - 09:15 Antonio Chella & Valeria Seidita (University of Palermo): Welcome and Introduction

09:15 - 10:00 Famira Racy & Julia Hagerty (Mount Royal University, Calgary): Self-awareness in Humans

In this presentation we define self-awareness and examine various manifestations it entails, such as mental time travel (episodic memory & prospection), Theory-of-Mind, self-reflection, self-knowledge, self-concept, self-rumination, and self-esteem. We also offer information about neuroanatomy, measurement techniques, functions of self-processes, and some correlations between these processes.

10:00 - 10:45 Alain Morin & Christina Duhnych (Mount Royal University, Calgary): Inner Speech in Humans

In this presentation we define inner speech and discuss existing measurement techniques, functions of inner speech, and neuroanatomy. We also present results from our most recent study (n = 227) using an open format Thought-Listing procedure, which suggests that university students talk to themselves most often about air negative emotions, problem solving, planning, self-motivating, emotional control, when alone or bored, self-awareness, memory, people, and studying.

10:45 - 11:15 Coffee Break

11:15 - 12:00 Domenico Parisi (ISTC-CNR, Rome): Do today's machines talk to themselves? Do they talk?

To construct robots that talk to themselves, it is first necessary to construct robots that talk, but today's robots cannot be said to talk because they do not understand the sounds that they produce. We describe some simple robots whose behavior is controlled by a neural network and that live in an environment and interact with the objects contained in that environment. In a succession of generations these robots evolve not only the capacity to interact appropriately with the objects contained in their environment but also the capacity to talk to themselves because their neural network contains a neural representation of both the sounds that they produce and the meaning of these linguistics sounds.

12:00 - 12:45 Pietro Perconti (University of Messina): Inner speech and the other kinds of self-consciousness

To design robots endowed with a human like inner speech, we have first to consider which features this latter has in the human mind architecture. In my talk I will argue that self-consciousness in humans is the inner space from which high-level simulation proceeds in its behavioral predictions and that inner speech is the linguistic side of that inner space. Inner speech consists of a temporal sequence of representations in which the attribution of a certain property to a reflexive representation has some consequences on the development of the reasoning, both in terms of inferences drawn between thoughts and of the experience of a new emotive "tone".

12:45 - 13:30 Lunch

13:30 - 14:15 Francesco Lanza & Valeria Seidita (University of Palermo): A Robot Cognitive Architecture for Human-Robot Interactions

Human-robot interaction for cooperation and team-work is a demanding task, from the development and the implementation point of view. In this context, we outline ongoing work on a robot cognitive architecture whose modules are able to build a model of the environment and of the inner world of the robot, populated by trust attitudes, emotions, capabilities, and the world of the other entities in the environment.

14:15 - 15:00 Arianna Pipitone & Antonio Chella (University of Palermo): Outline of a Robot Cognitive Architecture for Inner Speech

The experience of self-conscious thinking in the verbose form of inner speech is a common one. Such a covert dialogue accompanies the introspection of mental life and fulfills important roles in our cognition, such as self-regulation, self-restructuring, and re-focusing on attentional resources. Although the functional underpinning and the phenomenology of inner speech are largely investigated in psychological and philosophical fields, robotic research generally does not address such a form of self-conscious behavior. Models of inner speech inspire computational tools to provide robot with a form of self-consciousness. Psychological models of inner speech are reviewed, and a robot cognitive architecture implementing such capability is outlined.

15:00 - 15:45 Open discussion

15:45 - 16:00 Conclusions and adjourn