

An Introduction to Human-Robot Interaction

Course at a Glance

The present course will introduce the participants to the field of Human-Robot Interaction. It will discuss the contributions of the different disciplines involved and will illustrate the various methods adopted for the investigation of such a multidisciplinary topic.

Instructor

Alessandra Sciutti alessandra.sciutti@iit.it

Credits: 3

Synopsis

Understanding social interaction is a very challenging task. The dynamics of two agents interacting together is much more complex than just the sum of the behaviours of the two individuals. The actions, the movements and even the perceptual strategies each partner chooses are substantially modified and adapted to the cooperation. Notwithstanding its complexity, social interaction is of great interest not only for disciplines as neuroscience or psychology, but also from an engineering perspective. Indeed one of the biggest obstacles to a pervasive use of robots supporting and helping humans in their everyday chores relies on the absence of an intuitive communication between robotic devices and non-expert users. Several attempts have been made at achieving seamless interaction, even with positive outcomes in the context of the small manufacturing industries (e.g., the manufacturing robot Baxter). However the lack of a systematic understanding of what works and why does not allow yet for a generalization of this success in different domains. Hence, the study of Human-Robot Interaction is becoming progressively more central to foster a new generation of robots interacting naturally with their human partners.

In this course we will examine the different roles a robot could play in the context of human-robot interaction, as for instance the tutor, the collaborator, the companion or the tool of investigation. We will discuss the relevance of robot perceptual, motor and cognitive abilities for natural human-robot interaction and the good features and limitations of the currently available platforms. Furthermore the course will present the different methods adopted to investigate and evaluate the interaction between humans and robots.

Syllabus

Total of 10 hours in 5 classes of 2 hours each

- *Introduction: What is Human Robot Interaction.*
- *The importance of Robot Shape, Motion and Cognition.*
- *Metrics and Experimental Design.*
- *HRI Applications*
- *The future of HRI and Final Discussion*

Reading List

There is no single text on HRI, but readings will be assigned for each class.

Course dates

October-November2015