

Editorial

Second International Symposium on New Frontiers in Human-Robot Interaction

A two-day symposium (31 March – 1 April 2010) at AISB 2010, De Montfort University, Leicester, UK

<http://homepages.feis.herts.ac.uk/~comqkd/HRI-AISB2010-Symposium.html>

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Motivation and Background

Human-Robot Interaction (HRI) is a growing research field with many application areas that could have a big impact not only economically, but also on the way we live and the kind of relationships we may develop with machines. Due to its interdisciplinary nature different views and approaches towards HRI need to be nurtured. This symposium will provide a platform to discuss collaboratively recent findings and challenges in HRI.

The first symposium on “New Frontiers in Human-Robot Interaction” was held as part of AISB 2009 in Edinburgh, Scotland. The symposium organized in 2009 was characterized by excellent presentations as well as extensive and constructive discussions of the research among the participants.

Different categories of submissions are encouraged that reflect the different types of research studies that are being carried out. The symposium will encourage a diversity of views on HRI and different approaches taken. In the highly interdisciplinary research field of HRI, a peaceful dialogue among such approaches is expected to contribute to the synthesis of a body of knowledge that may help HRI sustain its creative inertia that has drawn to HRI during the past 15 years many researchers from HCI, robotics, psychology, the social sciences, and other fields.

Topics of interest include but are not limited to:

Developments towards robot companions; User-centred robot design; Robots in personal care and health care; Robots in search and rescue; Sensors and interfaces for HRI; Human-aware robot perception; Dialogue and multi-modal human-robot interaction; Robot architectures for socially intelligent robots; HRI field studies in naturalistic environments; Robot assisted therapy; Robots in HRI collaborative scenarios; Robots in schools and in other educational environments; Robots as personal assistants and trainers; Robot and human personality; New methods and methodologies to carry out and analyze human-robot interaction; Robots as companions and helpers in the home; Robots as

assistive technology; Long-term or repeated interaction with robots; ;Creating relationships with robots; Expressiveness in robots; Sustaining the engagement of users; Personalizing robots and HRI interfaces; Human-robot teaching; Robots that learn socially and adapt to people; User experience in HRI; User needs and requirements for HRI; Robots as autonomous companions; Robots as remote-controlled tools; Embodied interfaces for smart homes; Ethnography and field studies; Cross-cultural studies

The symposium attracted submissions in the following categories.

***N* Completed empirical studies reporting novel research findings**

In this category we encourage submissions where a substantial body of findings has been accumulated based on precise research questions or hypotheses. Such studies are expected to fit within a particular experimental framework (e.g. using qualitative or quantitative evaluation techniques) and the reviewing of such papers will apply relevant (statistical and other) criteria accordingly. Findings of such studies should provide novel insights into human-robot interaction studies.

***E* Exploratory studies**

Exploratory studies are often necessary to pilot and fine-tune the methodological approach, procedures and measures. In a young research field such as HRI with novel applications and various robotic platforms, exploratory studies are also often required to derive a set of concrete research questions or hypothesis, in particular concerning issues where there is little related theoretical and experimental work. Although care must be taken in the interpretation of findings from such studies, they may highlight issues of great interest and relevance to peers.

***S* Case studies**

Due to the nature of many HRI studies, a large-scale quantitative approach is often neither feasible nor desirable. However, case study evaluation can provide meaningful findings if presented appropriately. Thus, case studies with only one participant, or a small group of participants, are encouraged if they are carried out and analyzed in sufficient depth.

***P* Position papers**

While categories N, E and S require reporting on HRI studies or experiments, position papers can be conceptual or theoretical, providing new interpretations of known results. Also, in this category we consider papers that present new ideas without having a complete study to report on. Papers in this category will be judged on the soundness of the argument presented, the significance of the ideas and the interest to the HRI community.

***R* Replication of HRI studies**

To develop as a field, HRI findings obtained by one research group need to be replicated by other groups. Without any additional novel insights, such work is often not publishable. Within this category, authors will have the opportunity to report on studies that confirm or disconfirm findings from experiments that

have already been reported in the literature. This category includes studies that report on negative findings.

Y System Development Research in this category includes e.g. the design and development of new sensors, robot designs and algorithms for socially interactive robots. Extensive user studies are not necessarily required in this category.

Submission of Contributions

We invited unpublished, original work as extended abstracts (up to 3 pages) or full papers of up to 8 pages (double column).

Twenty-eight submissions were received and 21 were accepted for presentation at the symposium. All accepted presentations were peer-reviewed by members of the programme committee. Ten articles received 3 reviews each, the others received four reviews each. We like to thank the following researchers who served as additional reviewers for the symposium: Kyron Du Casse (University of Hertfordshire, UK), Robbie Morse (Indiana University, USA), Himalaya Patel (Indiana University, USA), Joe Saunders (University of Hertfordshire, UK) and Dag S. Syrdal (University of Hertfordshire, UK).

In addition to full paper presentations the symposium also includes panels and invited keynote talks. The symposium schedule will emphasize critical discussions of the presented research as well as wider issues that are important to HRI. The symposium also includes three invited keynote talks.

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Programme Committee

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Invited Keynote Speakers

Patrizia Marti (University of Siena, Italy): *Expressive robots and expressive interaction with robots: a design perspective*

Abstract:

Robot technology is surprisingly close to achieving autonomous bonding and sustained socialization with human beings. The concept of sociality in robots has taken on a wide variety of nuances and meanings that basically depend on the ability of machines to support the social model they refer to, and the interaction scenarios they can sustain. Within this framework several kinds of robots have been developed with the purpose of providing the human interlocutors with a "natural interface" and interaction possibilities.

While the definition of a phenomenology of artificial expressions and emotions of robotic creatures is beyond the scope of the keynote, a shift in focus will be taken from the design of expressive robots to the design of expressive interactions with robots as a means to support meaning construction and stimulate a natural interaction with human beings. Design and evaluation cases will be shown to analyse the potentials of new interaction paradigms enabled by the use of smart fabrics and materials.

Yorick Wilks (University of Sheffield, UK): *Is a Companion a distinctive kind of relationship with a machine?*

Abstract:

The talk starts from the perspective of the EC Companions project, and sets out what its aims were to model a new kind of human-computer relationship based on long-term interaction, with some tasks included but not being inherently task-based. A demonstration of its functionality will be given but the main purpose of the talk is a discussion of what it is people want from such a relationship and what evidence we have for whatever we conclude. Is politeness important? Is an attempt at emotional sympathy important or achievable? Does a user want a consistent personality in a Companion or a variety of personalities? Should we be talking more in terms of a "cognitive prosthesis (or orthosis)?" --- something to extract, organise, and locate the user's knowledge or personal information---rather than attitudes?

Giorgio Metta (IIT, Italy), as AISB2010 convention keynote speaker: *From biology to robots: the RobotCub project*

Abstract:

Simulating and getting inspiration from biology is certainly not a new endeavor in robotics (Atkeson et al., 2000; Sandini, 1997; Metta et.al. 1999). However, the use of humanoid robots as tools to study human cognitive skills it is a relatively new area of the research which fully acknowledges the importance of embodiment and the interaction with the environment for the emergence of motor skills, perception, sensorimotor coordination, and cognition (Lungarella, Metta, Pfeifer, & Sandini, 2003). The guiding philosophy – and main motivation – is that cognition cannot be hand-coded but it has to be the result of a developmental process through which the system becomes progressively more skilled and acquires the ability to understand events, contexts, and actions, initially dealing with immediate situations and increasingly acquiring a predictive capability (Vernon, Metta Sandini, 2007). To pursue this research, a humanoid robot (iCub) has been developed as result of the collaborative project RobotCub (<http://www.robotcub.org>) supported by the European Commission through the "Cognitive Systems and Robotics" Unit E5 of IST. The iCub has been designed with the goal of studying human cognition and therefore embeds a sophisticated set of sensors providing vision, touch, proprioception, audition as well as a large number of actuators (53) providing dexterous motor abilities. The project is "open", in the sense of open-source, to build a critical mass of research groups contributing with their ideas and algorithms to advance knowledge on human cognition (N. Nosengo 2009). The aim of the talk will be: i) to present the approach and motivation, ii) the illustrated the technological choices made and iii) to present some initial results obtained.

References

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