

COOPERATIVE AND SOCIAL ROBOTS: UNDERSTANDING HUMAN ACTIVITIES AND INTENTIONS

A key challenge of autonomous robots is to assist people in their daily-life activities or cooperate with them working together as a team. Coming generations of cooperative robots will take care of elderly people at home or help doctors in rehabilitation sessions for disabled people. In other kind of applications as, for example, rescue operations or agriculture, robots will be members of teams formed by humans and/or other robots. Collaborative tasks between humans and robotic manipulators will also improve the performance of industrial environments.

Much effort has been done in the development of social interactive robots, as entities that exhibit social characteristics in order to establish a natural and intuitive interaction with humans. Human-robot collaboration goes a step beyond. And while interaction implies action or influence on someone or something, collaboration will suppose working with others to achieve a common goal. To collaborate with a person in an effective way, a robot must be able to predict the result of an ongoing human action in order to know why its partner is doing that and therefore, determine what it should do next. Furthermore, it must be able to estimate human intentions and needs in order to react according to them, avoiding acting in conflict with the human is trying to do.

The **behaviour understanding of human actions and intentions** plays a key role in human-robot collaboration. And it is necessary make a clear distinction between actions and intentions. While understanding an action implies to recognize an ongoing process, the understanding of an intention has a predictive component, being necessary to make a judgement of the most probably actions that the human can carry out in the near future based on factors as the human context, its needs and goals, its feelings, emotions and attitudes. This behaviour understanding of actions and intentions not only implies to know what the human is doing or wants to do, also implies the knowledge about the results of these actions or intentions, in order to adapt its own behaviour and make an effective collaboration. Therefore, human-robot collaboration makes necessary to endow the robot with the ability to 'simulate', 'imagine' or 'emulate' actions and its results.

This Special Issue is meant to bring together researchers which address the problem of **understanding human actions and intentions within the general context of Cooperative and Social Robot**. Topics of the Special Issue include, but are not limited to:

- ✓ Unimodal and multimodal databases and benchmarks
- ✓ Supervised and unsupervised learning
- ✓ Facial expression, gesture and body movement for human behaviour understanding
- ✓ Verbal and non-verbal communication
- ✓ Multimodal communication
- ✓ Discrete and continuous event detection
- ✓ Theory of Mind
- ✓ Social Intelligence

- ✓ Social cognition and cooperative cognition
- ✓ Micro-expression detection
- ✓ Timing and dynamics of intra- and interpersonal communication
- ✓ Integration of multiple modalities and sensor information
- ✓ Audio-visual classification of human activities
- ✓ Affordance analysis
- ✓ Machine learning and robotics
- ✓ Cognitive modelling
- ✓ Machine recognition of human actions/intentions
- ✓ Applied intelligent robotic systems
- ✓ Computer vision and robotics
- ✓ Human-oriented navigation
- ✓ Embodied cognition
- ✓ Knowledge representation
- ✓ Emotion modelling
- ✓ Embodied social interaction
- ✓ ...

TENTATIVE SCHEDULE

- ✓ Submission period: September 2017
- ✓ Submission deadline: September 30th 2017
- ✓ First review notification: November 10th, 2017
- ✓ Revision submission: December 30th, 2017
- ✓ Second review notification: January 30th, 2018
- ✓ Acceptance notification: February 28th, 2018

SUBMISSION INSTRUCTIONS

Authors are invited to register at <http://ees.elsevier.com/prletters/> and submit their papers electronically during the submission period. When uploading their papers through the online system, authors should select the acronym **COBOT-UHAI** as the article type.

Papers should be prepared in a format consistent with the PRLetters submission guidelines. The maximal length of a paper is 10 pages in the PRLetters layout and may become 11 in the revised version if referees explicitly request additions. The submitted papers should not have been published previously, nor being under consideration for publication elsewhere. If one submission is the extended work of one conference paper, the original work should be included and a description of the changes should be provided. The PRLetters submission should include at least 30% new contribution (more experiments, proofs of theorems not included in the conference paper, more comparisons with other methods in the literature and so on); and the title of the PRLetters paper should be different, the same figures cannot be used and the common

part of the conference paper and of the extended version cannot be verbatim the same.

The review process will follow the standard PRLetters scheme. Each paper will be reviewed by at least two referees and two reviewing rounds will be possible in general, out of which major revision is possible only for the first round. Submissions will probably being rejected if major revision is still required after the second round of review.

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