Title: Social and Affective Robots

(Please, remember to use code **2m7er** to submit a paper to this Special Session)

Objectives and Motivation

Robots are expected to act as mediators to elicit more active communication and provide life support for humans. Robots have found a number of applications in many aspects of our daily life, including elderly care, therapeutic and educational purposes (e.g. therapy for children with autism), entertainment, wellbeing and so on. The critical role of robots here is to interact with and assist humans in their every-day activities. Towards achieving naturalistic interaction, it is necessary to endow the robots with social intelligence, and, in particular, ability to be able to respond appropriately to human affect. This, in turn, would allow them to simulate the human-human interaction and communication by being more engaging and
sensitive to our affective states.

Considering a wide variety of users, the robots should be also capable of deciding what kind of services and interactions they perform. The accurate and autonomous evaluation is needed through the technology (with a minimum supervision of humans), especially if the users are children or people with special needs. For this user-centred human-robot interaction, this requires that the social robots can learn the user's emotional states and be able to respond to it accordingly.

Advances in the affective computing field have recently allowed us to measure humans affective states such as emotions, empathy and engagement from different modalities. These include audio (verbal and non-verbal vocalizations), visual (body posture and facial expressions) and physiological (heart rate and electrodermal activity) signals. While advanced modelling techniques based on computer vision and machine learning have been proposed so far to analyse human behaviour using these modalities, a little attention has been paid to analysis of affect from naturalistic behaviours as expressed in human-robot interactions (HRI).

The main aim of Affective Robot Special Session is to bring together researchers working in Robotics and Artificial Intelligence, and exploit jointly the most recent advances in these two fields. This special session is oriented towards sharing the ideas of participants with diverse background ranging from robotics, machine learning, computer vision and social psychology. The goal is to facilitate the integration of social robotics and affective computing as an emerging field. In particular, the goal of the special session is to identify new concepts and challenges (methodologies, ethical questions) in designing and learning of robots that are affect-sensitive.

List of Topics

A number of topics are to be addressed:

- Design of social robots, including studies showing the influence of the robot design on the social interactions with humans.
- Modelling of human affect from data recorded during HRI.
- The fusion of different modalities (audio, visual and physiological) for estimation of humans' affective states during HRI.
- Applications of social robots to elderly care, entertainment and wellbeing, and also assistive tools for individuals with autism and/or other neurodevelopmental conditions.

In addition to these, other contributions addressing the social dimension of HRI are highly encouraged.

Corresponding Keywords

Social robot, Affective computing, Therapeutic robot

Organizers

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Jaeryoung Lee received her B.S. in Mechanical Engineering from Pusan National University, Korea in 2009 and her M.S. and Ph.D in Mechanical Engineering from the Nagoya University, Japan in 2012, 2014. She is currently an assistant professor of the department of Robotic Science and Technology in Chubu University, Japan, where she teaches Human-robot coexsitance, Humanoid Robot Control, and Human Robot Interaction. Her research interests are in robot-assisted therapy, rehabilitation robotics, and human machine interaction.

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Ognjen is a Marie Curie Postdoctoral Fellow at MIT Media Lab (Affective Computing individuals Group). His research is mainly focused on computer vision and machine learning algorithms for automated analysis of human affect. Currently, his work is focused on analysis of multi-modal (visual, audio and physiological) affect data, and the design of wearable and robot technologies for advancing communication and wellbeing of individuals with neurodevelopmental conditions (autism). He has co-organized several highly successful workshops on modelling of human affect.

3. Rosalind W. Picard, ScD, Affective Computing Group, MIT Media Lab, USA.

Rosalind W. Picard is a professor of Media Arts and Sciences at the MIT Media Lab, founder and director of the Affective Computing Group at the MIT Media Lab. She received the ScD degree in electrical engineering and computer science from MIT. She is also a co-founder of Affectiva, Inc. and Empatica, Inc. Her current research interests focus on the development of technology to help people comfortably and respectfully measure and communicate affective information, as well as on the development of models of affect that improve decision-making and learning. She is a fellow of the IEEE and member of the IEEE Computer Society.