Editorial

Shuzhi Sam Ge^{1,2,3} · Agnieszka Wykowska⁴ · Oussama Khatib⁵

Published online: 29 March 2019
© Springer Nature B.V. 2019

For this issue, we are honored to introduce a collection of ten papers which covers a wide range of exciting topics in social robotics.

The first work “Free Kinematic Singularity Controller for a Planetary Gear Based Cobot” (by Omar Mendoza-Trejo, Erick A. Padilla-García, Carlos A. Cruz-Villar, Alejandro Rodríguez-Angeles) presents a velocity control for cobots, which is free of Jacobian singularities. Experiments are conducted on a two degree of freedom cobot with differential gear trains in serial configuration. The results show that cobotic systems performance is not affected by kinematic singularities and cobot can properly work in their whole workspace.

In the second paper “Skeleton-Based Human Action Recognition by Pose Specificity and Weighted Voting” by Tingting Liu, Jiaole Wang, Seth Hutchinson, Max Q.-H. Meng, the authors introduce a human action recognition method based on skeletal data captured by Kinect or other depth sensors. The human poses in skeleton-based human action recognition are proposed to be divided into two major categories: the discriminating pose and the common pose. Experiments on two benchmark datasets are conducted and the results illustrate that the proposed methods outperforms the state-of-the-art methods.

In the third work on “Dating a Synthetic Character is Like Dating a Man” by Johan F. Hoorn, Elly A. Konijn, Matthijs A. Pontier, the authors put a virtual human capable of speech and facial expressions to an updated and enriched version of the traditional Turing test. Results are obtained with frequentist analysis and Bayesian structural equation modeling, and their emotionally intelligent software are proved to be useful for believable affective virtual humans or robots.

The fourth paper is “Head Impact Severity Measures for Small Social Robots Thrown During Meltdown in Autism” by Ahmad Yaser Alhaddad, John–John Cabibihan, Andrea Bonarini. In this paper, the authors identified harmful scenarios that might emanate between a child and a social robot due to severity indices for one of the challenging behaviors. The results showed that the overall harm levels based on the selected severity indices were relatively low compared to their respective thresholds, but could potentially cause tissue injuries, subconcussive or even concussive events in extreme cases.

The fifth work is “A Feasibility Study for Validating Robot Actions Using EEG-Based Error-Related Potentials” by Stefan K. Ehrlich, Gordon Cheng. The authors propose a neuro-based method for real-time quantitative assessment of robot actions. The method encompasses the decoding of error-related potentials (ErrPs) from the electroencephalogram (EGG) of a human during interaction with a robot. The results of their study demonstrated that ErrPs can be sensitive to the stimulus eliciting them despite procedurally identical protocols and confirmed the feasibility of ErrP-decoding for human–robot validation.

The six paper is “Social Touch in Human–Robot Interaction: Robot-Initiated Touches can Induce Positive Responses without Extensive Prior Bonding” by Christian J. A. M. Willemsse, Jan B. F. van Erp. In this paper, the authors investigated whether robot-initiated touches could elicit beneficial responses in the human user that are comparable to responses to human touch, and whether having a pre-existing positive social bond with the robot modulates these responses. Their finding implies that robotic touches

✉ Shuzhi Sam Ge
samge@nus.edu.sg
Agnieszka Wykowska
agnieszka.wykowska@iit.it

¹ Social Robotics Laboratory, Smart Systems Institute, The National University of Singapore, Singapore, Singapore

² Institute for Future (IFF), Qingdao University, Qingdao 266071, China

³ Centre for Robotics, UESTC, Chengdu, China

⁴ Social Cognition in Human-Robot Interaction, Istituto Italiano di Tecnologia, Genoa, Italy

⁵ Artificial Intelligence Laboratory, Department of Computer Science, Stanford University, Stanford, CA, USA

attenuated physiological stress responses and increased the perceived intimacy of the human–robot bond.

The seventh paper “The Social Perception of Humanoid and Non-Humanoid Robots: Effects of Gendered and Machinelike Features” (by Steven J. Stroessner, Jonathan Benitez) conducted two studies pursuing the effects of the synthetic robot face features on social categories and judgments. The results exhibited that robots were evaluated more positively and produced a greater desire for contact to the degree that they were seen as humanlike and feminine, which attest to the importance of social factors in predicting responses to robots.

The eighth work “A Study on the Deployment of a Service Robot in an Elderly Care Center” (by David Portugal, Paulo Alvito, Eleni Christodoulou, George Samaras, Jorge Dias) addresses the implementation and deployment of a service robot platform for interaction with the elderly in the context of a collaborative European initiative. The authors describe the initial validation tests in a semi-controlled scenario and the deployment of the robotic platform during a week-long pilot in and end user environment, which show generally positive reactions from the care center residents.

The following paper, “Will Older Adults Accept a Humanoid Robot as a Walking Partner?” (by Deneth Karunarathne, Yoichi Morales, Tatsuya Nomura, Takayuki Kanda, Hiroshi Ishiguro), presents an empirical study with

elder adults and compared situations where they walked alone and with a robot. A parameter-based side by side walking model which uses motion, environmental and relative parameters derived from human–human side by side walking was used to navigate the robot autonomously. It is finally revealed that the participants wanted to walk with robot again because they felt positive about at present.

In the last paper, “Adult Verbal Comprehension Performance is Better from Human Speakers than Social Robots, but only for Easy Questions” (by Adam Palanica, Anirudh Thommandram, Yan Fossat), the authors examined whether any differences existed in verbal and nonverbal comprehension performance when information was communicated through either a human or a robot speaker, and whether question difficulty moderated comprehension performance. The results suggest that the traditional use of social robots for simple communications could be extended to more complex domains.

Publisher's Note Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.