PREFACE

Preface

Shuzhi Sam Ge¹ · Oussama Khatib²

Published online: 18 April 2017
© Springer Science+Business Media Dordrecht 2017

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

In the first paper on “Survey of Factors for the Prediction of Human Comfort with a Non-anthropomorphic Robot in Public Spaces” by David C. May, Kristie J. Holler, Cindy L. Bethel, Lesley Strawderman, Daniel W. Carruth and John M. Usher, a literature review and empirical analysis of factors that may influence human perceptions and attitudes toward nonanthropomorphic robots in public spaces were conducted. Within the limitations of the sample under study, the findings suggested that although important gender, race, age, and contextual differences were uncovered, adults were largely accepting of mechanical-appearing robots in public environments and this acceptance varied little across demographic factors. Additionally, adults were also curious about the potential that robots have to assist humans in those environments.

The second paper on “Personal Greetings: Personalizing Robot Utterances Based on Novelty of Observed Behavior” by Dylan F. Glas, Kanae Wada, Masahiro Shiomi, Takayuki Kanda, Hiroshi Ishiguro and Norihiro Hagita, demonstrates a working example of how data-driven machine learning techniques can be used to enhance social human–robot interactions by helping to personalize interaction contents. By

using a pattern consistency classifier and utterance generator trained to reproduce the judgment and utterances of humans, the robot was shown to be able to produce humanlike greetings in response to these real shared experiences, creating a feeling of personal familiarity with the robot’s conversation partner.

The third work on “People’s Attitudes to Robots in Caring for the Elderly” by John Hudson, Marta Orviska and Jan Hunady analyses people’s attitudes to robots to be used in caring for the elderly. It is found that the elderly themselves are indeed more hostile to the concept that robots offer a partial solution to the rising cost of caring for the elderly than the young as both theory and the literature suggests. Meanwhile, attitudes also differ both between countries and within countries across socioeconomic characteristics.

The fourth paper on “cBDI: Towards an Architecture for Human–Machine Collaboration” by Aditya Saikia and Shyamanta M. Hazarika introduces the implemented architecture for collaborative Belief-desire-intention (BDI) agents that could interact with a user to carry out tasks. BDI paradigm was used to achieve human-like intelligence. The effectiveness of the cBDI-based collaborative architecture was evaluated within a ROS-USARSim framework.

The fifth paper “Teaching Robot’s Proactive Behavior Using Human Assistance” is authored by A. Garrell, M. Vilamizar, F. Moreno-Noguer, A. Sanfeliu. They performed a comprehensive study on various topics involved in the interaction between a mobile robot and untrained human volunteers for a variety of tasks. In particular, this work presents a framework that enables the robot to proactively approach people and establish friendly interaction. Experiments were performed on a social robot Tibi to validate their ideas.

In the sixth paper, “The Berimbot: A Robotic Musical Instrument as an Outreach Tool for the Popularization of Science and Technology” by Ivan Cardoso Monsão, Jês de

✉ Shuzhi Sam Ge
samge@nus.edu.sg

Oussama Khatib
ok@cs.stanford.edu

¹ Social Robotics Laboratory, Interactive Digital Media Institute, National University of Singapore, Singapore, Singapore

² Artificial Intelligence Laboratory, Department of Computer Science, Stanford University, Stanford, CA, USA

Jesus Fiais Cerqueira, Augusto C. P. L. da Costa, José A. S. Dias, the engineering design of a robotic musical instrument is presented to the segment of the population not served by traditional academic initiatives or outreach programs. The concepts of teamwork, consulting and multidisciplinary are also examined.

The seventh paper, “A Novel Human–Robot Cooperative Method for Upper Extremity Rehabilitation”, written by Jing Bai, Aiguo Song, Baoguo Xu, Jieyan Nie, Huijun Li, proposes a human–robot cooperative method for upper extremity rehabilitation. Legs motion was considered at the passive rehabilitation training of disabled arm, and its traversed trajectory was represented by the patient trunk motion. The human–robot cooperative upper extremity rehabilitation system was constructed by a Kinect-based vision module, two computers and a WAM robot.

In the eighth paper on “Exploiting the Robot Kinematic Redundancy for Emotion Conveyance to Humans as a Lower Priority Task” by Josep-Arnat Claret, Gentiane Venture and Luis Basañez, the capabilities of the Jacobian null space of a humanoid robot to convey emotions was explored. The paper shows that the emotions, defined by Mehrabian as points in the pleasure–arousal–dominance space, generated intermediate motion features that carried the emotional information. A map from this features to the joints of the robot was presented. The results of the studies showed that happiness and sadness were very well conveyed to the user, calm was moderately well conveyed, and fear was not well conveyed. Overall, the results showed that the null space approach can

be regarded as a promising mean to convey emotions as a lower priority task.

In the ninth paper on “Acceptance of Social Robots by Elder People: Does Psychosocial Functioning Matter” by Stefanie Baisch, Thorsten Kolling, Arthur Schall, Saskia Rühl, Stefanie Selic, Ziyon Kim, Holger Rossberg, Barbara Klein, Johannes Pantel, Frank Oswald and Monika Knopf, the relevance of psychosocial functioning for the acceptance of social robots by elder people in the context of everyday functioning was investigated. The conducted experiments showed the importance of psychosocial variables for the acceptance of social robots by elder people and underline the relevance of the fit between user and technology. Moreover, they suggested a more intense consideration of complex psychological mechanisms and individual user characteristics in research on robot acceptance by elder people.

Last but not least, “Socio-Contextual Constraints for Human Approach with a Mobile Robot” by Daniel Carton, Wiktor Olszowy, Dirk Wollherr and Martin Buss, examines specific trajectory features that provide the required natural movements and support intention conveyance, where robots act in a shared environment with humans. Based on optimal control framework, the robot-to-human approach problem had been formalized such that social context can be integrated in trajectory planning. Results showed that the perceived naturalness and the comprehensibility of robot-to-human approach motions was significantly higher for trajectories with human-like features.