Guest Editorial Preface

Special Issue on Social Robotics

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Recently, various types of social robots have been developed so far. Originally, sociality was discussed to realize cooperation among robots, e.g. collective behaviors in distributed autonomous robots. Afterward, as the technological progress related with interaction and communication such as speech recognition and gesture recognition, the research on human-robot interactions was discussed aggressively. Dautenhahn and Billard (Fonga et al., 2003) proposed the following definition: Social robots are embodied agents that are part of a heterogeneous group: a society of robots or humans. They are able to recognize each other and engage in social interactions, they possess histories (perceive and interpret the world in terms of their own experience), and they explicitly communicate with and learn from each other. This definition includes important discussion points such as embodiment, social interaction, perception, interpretation, explicit communication, experience, and learning. These are deeply related with the social psychology and cognitive science to deal with social communication, verbal and non-verbal communication, and social learning in addition to artificial intelligence, computational intelligence, collective intelligence, and emotional intelligence. Furthermore, we should discuss social robots from the technological point of view; e.g., the hardware design of human-friendly robots, human-robot interaction mechanisms, perception and recognition methods, natural language processing methods, machine learning algorithms, and human-robot co-existing environmental design. And also, we have to discuss the applicability of social robots to real world problems such as elderly care, rehabilitation support, edutainment, tele-presence, and information service. The role of social robots is becoming more important as an interface of cyber-physical systems. Especially, we also will have to deal with the ethics towards the coexistence society of people and social robots.

This special issue focuses on the social robotics based on the above topics related with from psychological, sociological, and technological points of view to realize the next generation of social robots. For this special issue, ten papers have been accepted through two or more round peer reviews, and this special issue was divided into two issues. The topics of accepted papers in this issue are related with (1) the framework principle of adaptive intelligent systems for social robots, (2) the design support system of hardware, software, and interaction content of robot partners, (3) the social application of humanoid robots as autonomous exercise instructors, (4) the map building and localization based on hippocampal place cell learning in a public area, and (5) reinforcement learning in multitask environment interacting with a human. To summarize, the papers for this issue highlight the challenging problems and novel applications in social robotics. We would like to express our sincere thanks to all the authors and gratitude to reviewers for this special issue. We hope that this special issue will inspire others to study and develop in the research fields related with social robotics.

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