FOREWORD

Special Section on Frontiers in Agent-based Technology

Intelligent agents are software entities that can carry out some actions on behalf of clients with some degree of autonomy. Through sensing the status of environment, agents perform operations based on their possessed knowledge in order to change or influence the environment towards their goals. A Multi-Agent System (MAS) is a group or society of agents, and agents interact with others in the group cooperatively and/or competitively in order to reach their individual or common goals. In general, agents possess five common properties which are autonomy (some level of self-control), adaptivity (the ability to learn and improve performance with experience), reactivity (the ability to perceive the environment and to respond in a timely fashion to changes that occur), proactivity (the ability not only to act simply in response to their environment but also to exhibit goal-directed behaviour by taking the initiative) and sociability (the ability to interact, communicate and work with other agents). Research on agent techniques and MASs mainly focus on improving existing or invent innovative frameworks, models, mechanisms, approaches and algorithms to improve agents effectiveness and efficiency in those five aspects for advanced autonomous problem solving abilities in complex environments.

We envision a future society where computational agents and humans (physical agents) are linving, working and snuggling with each other. Harmonious collaboration among computational agents and humans are of importance in the next-generation society.

The following research area are the main targets in this special issue:
- Decision making techniques
- Multi-agent communication and interaction protocols
- Negotiation and argumentation
- Game theory and auctions
- Social Computing
- Cooperation, collaboration and coordination mechanisms
- Self-organization and self-adaptation
- Computational Reasoning
- Machine learning
- Complex systems and system dynamics
- Collective Intelligence
- Programming languages
- Internet of things, agents, and people
- Systems designs, development and implementation
- Human and multi-agent systems interaction
- Social science and humanities
- Ethical, legal, and social issues
- Future visions and grand challenges
and other related areas.

Agent technique and multi-agent system are very important fields in Artificial Intelligence (AI). We believe that this special issue will attract attentions from not only AI researchers, but also domain experts and industrial investigators who are interested in the applications of AI techniques.

Takayuki Ito (Nagoya Institute of Technology, Japan), Guest Editor-in-Chief

Takayuki Ito *(Member)*   is Professor of Nagoya Institute of Technology. He received the Doctor of Engineering from the Nagoya Institute of Technology in 2000. He was a JSPS research fellow, an associate professor of JAIST, and a visiting scholar at USC/ISI, Harvard University, and MIT twice. He was a board member of IFAAMAS, the PC- chair of AAMAS2013, PRIMA2009, General-Chair of PRIMA2014, IEEE ICA2016, is the Local Arrangements Chair of IJCAI2020, and was a SPC/PC member in many top-level conferences (IJCAI, AAMAS, ECAI, AAAI, etc). He received the JSAI Achievement Award, the JSPS Prize, the Fundamental Research Award of JSSST, the Prize for Science and Technology of the Commendation for Science and Technology by the Minister of Education, Culture, Sports, Science, and Technology (MEXT), the Young Scientists' Prize of the Commendation for Science and Technology by the MEXT, the Nagao Special Research Award of IPSJ, the Best Paper Award of AAMAS2006, the 2005 Best Paper Award of JSSST, and the Super Creator Award of 2004 IPA Exploratory Software Creation Project. He was a JST PREST Researcher, and a principal investigator of the Japan Cabinet Funding Program for Next Generation World-Leading Researchers. He is currently principal investigator of JST CREST project.