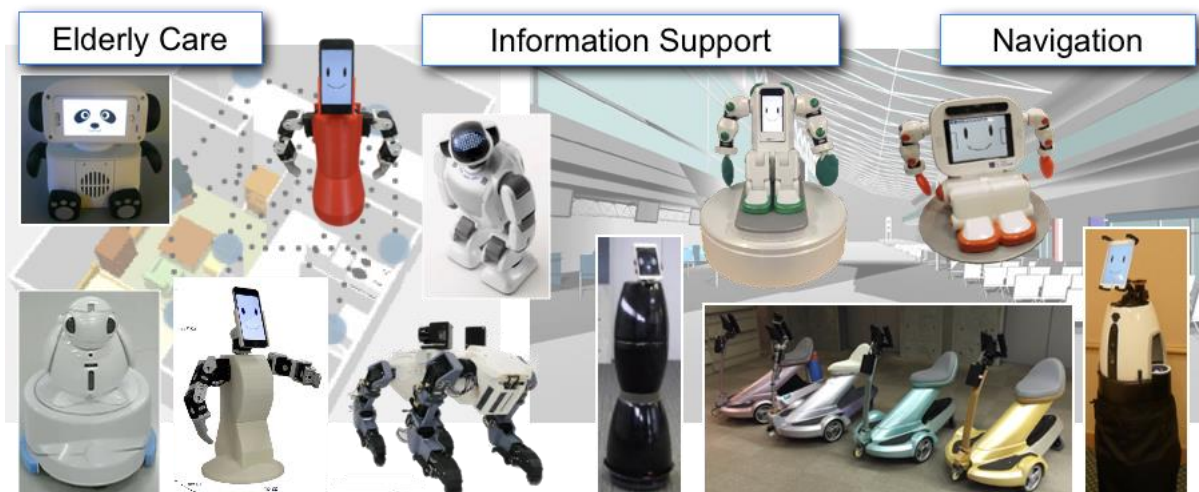


Intelligent Technology for Social Robotics

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Abstract: Recently, as the rapid progress on emerging integration of information and communication technology (ICT) and robot technology (RT), we came to be able to apply various types of social robots to solve real-world problems. The aim of scientific research on social robotics is to investigate the theory and methodology on social communication and interaction by using human-friendly robots, but the intelligent technology is the most important to realize the emerging synthesis of ICT and RT in social implementation. In Tokyo Metropolitan University, the Research Center for Community-centric Systems was established in 2015 to deal with social problems such as elderly care, social rehabilitation, and information support in disaster situation, while the Research Core on Service Robot Incubation Hub was established in 2016 to realize the flexible open innovation through the workshops and prototyping with company researchers, users, and customers. We have collaborated with many companies in order to develop social robots. First, we explain the methodology on intelligent technology on learning, adaptation, and prediction required for social communication and interaction with people. Next, we show several examples of the development of robots; (1) robot partners called iPhonoid and iPadrone, (2) guide robots in airport or shopping centers, (3) multi-robot theater for education, shopping guide, and amusements. Finally, we will discuss the future direction of cognitive robotics to solve real-world social problems.





Naoyuki Kubota graduated from Osaka Kyoiku University in 1992, received the M.E. degree from Hokkaido University in 1994, and received the D.E. degree from Nagoya University, Japan in 1997. He was an Assistant Professor and Lecturer at the Department of Mechanical Engineering, Osaka Institute of Technology, Japan, from 1997 to 2000. In 2000, he joined the Department of Human and Artificial Intelligence Systems, the School of Engineering, Fukui University, as an Associate Professor. He joined the Department of Mechanical Engineering, the Graduate School of Engineering, Tokyo Metropolitan University, Japan, as an Associate Professor in 2004. He was an Associate Professor, at the Department of Human Mechatronics Systems, the graduate School of Systems Design, Tokyo Metropolitan University, Japan, from 2005 to 2012. He is currently a Professor at the Department of Mechanical Systems Engineering, the Graduate School of Systems Design, Tokyo Metropolitan University, Japan. He was a Visiting Professor at University of Portsmouth, UK, in 2007 and 2009, and was an Invited Visiting Professor at Seoul National University from 2009 to 2012. His current interests are in the fields of coevolutionary computing, fuzzy computing, topological mapping, cognitive robotics, social robotics, and informationally structured space. He has published more than 500 refereed journal and conference papers in the above research fields. He received the Best Paper Award of IEEE IECON'96, the Best Paper Award of IEEE CIRA'97, and so on. He was an associate editor of the IEEE Transactions on Fuzzy Systems from 1999 to 2010, the IEEE CIS Intelligent Systems Applications Technical Committee, Robotics Task Force Chair from 2007 to 2014, IEEE Systems, Man, and Cybernetics Society, Japan Chapter Chair since 2018, and others.