【Grant-in-Aid for Scientific Research on Innovative Areas (Research in a proposed research area)】

Interdisciplinary Area

Title of Project：Studies on intelligent systems for dialogue toward the human-machine symbiotic society

ISHIGURO Hiroshi
(Osaka University, Department of Systems Innovation, Professor)

Research Project Number：19H05690　Researcher Number：10232282

【Purpose of the Research Project】

In the near future, various home appliances and robots will act autonomously and will have intentions and desires. As they have intentions and desires, they will be able to establish relationships with humans in which they understand each other's intentions and desires by using natural language to interact with each other (see the figure below). This kind of world is a society in which humans and intelligent robots and information media coexist in the next stage of the information society.

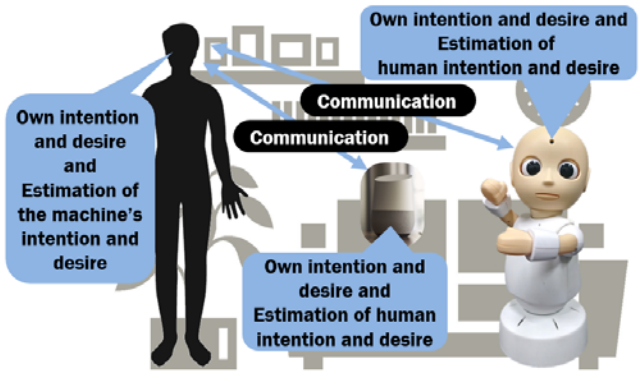

Figure1. Conversation with systems that have intentions and desires

In order to create an academic field that realizes this new symbiotic society, we will engage in research and development with four research groups: dialogue engagement and rapport research, communication understanding and generation research, behavioral decision model estimation research, and human-machine social norms research.

In addition, we will plan and manage field experiments and work on collaboration between the four research groups, as well as discovering and solving new research issues and fostering young researchers. We will study the influence of robots with intentions and desires on society, and propose social norms for a robot-symbiotic society.

【Content of the Research Project】

In order to achieve the above objectives, we will work on the following research while combining research in various fields.

Dialogue engagement and rapport research: we will realize the communication ability to maintain engagement and rapport even if the content of the communication is not completely understood.

Communication understanding and generation research: we will realize the communication ability to combine communication understanding and dialogue generation for a specific objective in a specific situation.

Behavioral decision model estimation research: we will realize the functions of robots that build behavioral decision models and that estimate the behavioral decision models of the other party.

Human-machine social norms research: Through public meetings held together with demonstrations of experiments, we will not only study the effects of robots with intentions and desires on people, but also propose social norms for a robot-symbiotic society.

Then, in this new academic field, under the leadership of the general manager group, we will work on field experiments using the developed information media and communication robots in the real world, and discover new problems to be solved through these field experiments. We will then prototype entirely new communication robots and information media with intentions and desires that can coexist with humans, and explore the possibilities of the intelligent robot/information media symbiotic society that will come after the information media society.

【Expected Research Achievements and Scientific Significance】

The research in this field departs from the unilateral tool-like relationship between humans and machines, where humans send instruction to machines, to establish a relationship between humans and machines where they mutually adapt to each other. Specifically, the autonomy of machines and information media will progress. In doing so, humans and machines and information media will create new relationships in which they interact with each other while deducing each other's intentions and desires through the use of natural language dialogue.

【Key Words】

Autonomous conversational robot: A robot that interacts autonomously based on its own intentions and desires.
Human-machine social norm: A social norm for building desirable relationships between humans and machines.

【Term of Project】 FY2019-2023

【Budget Allocation】 1,088,500 Thousand Yen

【Homepage Address and Other Contact Information】

http://www.commu-ai.org