



Accessible technology for human-AI collaboration

Human interaction platform technology will change nursing care and education.

A system that mutually links cyberspace and physical space is essential for the realization of Society 5.0. In this program, program director (PD) Yuichiro Anzai was interviewed on the topic of “human interaction platform technology,” which is a cyberspace platform technology that contributes to human-AI collaboration.

"To lead the transformation of the industrial structure and the creation of new industries via the development of AI platform technology"

Q: What is the goal of “Big-data and AI-enabled Cyberspace Technologies”?

PD: Artificial intelligence (AI) is now at the forefront of information technology. This technology facilitates the discovery of regularities in a dataset. AI is used to analyze the characteristics of data and to identify inherent patterns, for example automatic identification of subjects in images or videos.

Data in cyberspace is still increasing dramatically. We believe that social transformation can be achieved by analyzing these large amounts of data in a sophisticated manner using AI, thereby allowing this data to be exploited to provide critical services in the real-world.

For example, Gutenberg invented a movable-type printing press in approximately 1450, and it led to the initiation of the Lutheran Reformation in 1517. This occurred because the printing press made it possible to print important documents such as the Bible, that was then made available to the general public. Prior to the printing press, it was difficult to popularize the Bible because it was handwritten. As such, the printing press was a technological innovation that changed Christianity.

A similar situation is now occurring as a result of AI. The innovation of information technology is changing the world. Digital transformation, which means the transformation of the industrial structure and the emergence of new technologies from digital technology is occurring throughout the world.

To develop technologies that will serve as the platform for this digital transformation in Japan, this SIP program aims to create new business models and services, to strengthen Japan’s industrial competitiveness, and to identify solutions to social issues via social implementation of cyberspace technologies.

Q: It is stated that “human interaction platform technology” will be

developed and demonstrated in nursing care, education, customer service and other fields where human-AI collaboration can be effective. What is the purpose of this?

PD: The shortage of caregivers is a major social issue in the field of nursing care. We are therefore working on technology to support caregivers and care-receivers. For example, if automatically monitoring whether a care-receiver has excreted solid or liquid waste is possible, the workload of caregivers will be significantly reduced.

In many cases, technologies are offered in a perfunctory manner with phrases such as “you can do this and that with these technologies,” but I believe that the most important aspect is to support caregivers in addressing problems that they typically encounter or to assist care-receiver to become self-reliant.

"Realization of advanced human-AI collaboration using multimodal information"

Q: Next, please explain “advanced multimodal dialogue technology.”

PD: As an example, voice recognition is not easily performed in cars because there are typically numerous sources of noise. Unlike human-to-human dialogue, where mutual communication can be performed by interpreting information other than words such as facial expressions, body posture, and nodding, communication with AI is quite difficult.

For example, imagine a scene in which an individual gives an instruction to a robot. When this individual who controls the robot’s movement says “no,” it is very difficult for the robot to understand if the person means “No, don’t stop” or “No, don’t keep running,” unlike humans who can understand the meaning by assessing the situation using their five senses. It is necessary for the robot to recognize that “no” means “No, don’t keep running” or “Stop.”



Therefore, it will be necessary to establish a mechanism whereby robots are equipped with distance, infra-red ray, and other sensors, and can use the data from these sensors to deduce the meaning of instruction by linking this data to the word “no.”

If the robot is still unable to understand the meaning, it can verbally inquire about the meaning of “no”. “Advanced multi-modal dialog technology” facilitates such sophisticated and intelligent communications between humans and computers. I’ll explain the mechanism in more detail. For example, if an application has a “large electronic dictionary,” when the human voice input “No” and data of various sensors are acquired, the application matches the data with the “large electronic dictionary” and assumes that the voice input means “Stop.” It is the AI’s job to operate this very complex mechanism.

People say, “AI is great!” in today’s society, because AI can learn. For example, it interprets the instruction “No” as “Stop” by incorporating various surrounding information and if the meaning is correct, it is added to the dictionary, and experience is accumulated. The dictionary becomes increasingly larger and its accuracy will also improve. Then, when the robot is in a similar situation in the future, the possibility of determining the correct answer and performing the appropriate task will increase.

Q: If the percentage of correct answers increases and surpasses that of humans, do you think that the prevalence of unease among potential users of AI technology may increase?

PD: In Western countries, the hurdle is low even for using IT, far less AI. It is used as commonly as stationery. However, it is also true that AI is often treated as “that lies ahead of IT” in Japan (laugh).

Q: For the young generation, AI including deep learning technology may now be seen as merely familiar means of data utilization. They just exist as tools.

PD: It is absolutely unnecessary to feel uneasy about new technologies. It is true that there are ethical and social issues to consider. However, similar to the Road Traffic Act for automobiles, all we need to do is set rules on personal information protection, security, intellectual property, and other matters, and observe such rules.

"With the aim of realizing Society 5.0, that makes it possible for everyone to use new information technology and live an active life"

Q: Please explain “learning support technology” of human interaction platform technology.

PD: I want learning support technology to assist students in

learning and improving themselves, with respect to their individual abilities. I want to provide support for AI use so that they will be able to learn while having fun, in addition to identifying their strengths and weakness. I hope everyone will be able to learn actively regardless of disabilities, family situations or other conditions.

Q: Finally, what is your vision for Society 5.0?

PD: My vision is a new era in which citizens will have equal access to cyberspace platform technology to achieve individual happiness.

Q: Telephones progressed from the era of dialing to mobile and smartphones, which are now devices for obtaining information about things in cyberspace, rather than making calls. Moreover, their merits and benefits are gradually changing.

PD: That is a very good example. For today’s generation, smartphones already existed when they were born. I think that people’s attitudes will change naturally in the same way. I also believe that a future in which everyone will live enjoyable and active lives by exploiting new information technology is on the horizon.

