PD Interview

Program Director Interview

12 Leading Experts Who Accelerate SIP

Realize a world where AI supports human interaction in our daily life

Aiming at improving social productivity with the aid of AI technology and data exchange

To achieve a federation between cyber and physical spaces, Society 5.0 requires technologies for a federation of various databases and AI to blend into our daily life to assist humans. We interviewed program director (PD) ANZAI Yuichiro, who is engaged in research such as “Human-interaction platform technology” and “Inter-domain data exchange platform technology” to address these issues.

ANZAI Yuichiro

Senior Advisor, Director of Center for Science Information Analysis, Japan Society for the Promotion of Science

“Human-interaction platform technology” will be an advantage for Japan

Q: In R&D for “Human-interaction platform technology”, platform technologies are categorized into intra-domain and inter-domain technologies. Could you explain each technology?

PD: Intra-domain technology is the platform technology that can be commonly utilized among multiple applications in the industrial domain. For example, in the domain of nursing care for elderly people, interactive processing technology is applied to obtain accurate physical conditions including information on voices for conversations, gestures, etc. When a care-receiver stays in a toilet for a long time and a caregiver cannot monitor the situation closely, AI can talk to the care-receiver, assess the situation, and notify the caregiver. Furthermore, this technology can be utilized in other applications in various domains, such as the medical domain, e.g., automatically analyzing an electrocardiogram and detecting any abnormality or symptom, and in the construction domain, e.g., conducting image analysis on concrete and detecting cracks. Inter-domain technology, on the other hand, can be utilized in various domains as a module, independent of intra-domain knowledge or contexts. For example, interpersonal communication is essential for customer service, nursing care, and in the education industry. In order to analyze audio data with AI, you have to identify each speaker by their voice. Such “Voice separation technology” was originally developed to reason customers’ feelings in the customer service industry. However, it is expected to be applied to other industries which involve many forms of dialogue, e.g., education and nursing care. For example, “AI Hospital” is one of the programs for the second period of SIP. “Voice separation technology” will be provided as a software module in the medical domain and utilized to separate the voices of medical practitioners from patients in conversations during medical examinations.

Q: Tell us the significance of creating “platform technologies” regarding human interaction.

PD: Customer service, nursing care and education, the target domains of our project, involve close communication among humans. It is a very high-level research field to integrate information such as intonations and gestures besides the content of speech, analyze human feelings or the meaning of the words based on multimodal information, and reason with AI. Therefore, I believe it is significant for SIP to work on R&D for “Human-interaction platform technologies”, focusing on the above-mentioned areas. Also, it will be an advantage to Japan as the competition for developing AI is becoming fierce worldwide.

For accelerating specific efforts to socially implement the technology

Q: Could you share the current achievements of productivity improvement for the target domains set as the goal in your project?

PD: We developed the master plan to demonstrate 20 or more cases which will result in productivity improvement by 10% and above. We are also propelling a variety of verifications.

For example, with the goal to improve productivity of recording journals in home-visit nursing, a dialogue system was implemented to obtain information on physical conditions

including voices and gestures. In this instance, the number of in-person visits has decreased and the productivity has already improved by 10.1%. Although it is currently under verification, we will also promote R&D/verification to achieve the goal of productivity improvement for customer service and training at restaurants, airlines and department stores, etc., and maintenance of transport infrastructure.

Q: You have been engaged in inter-domain consortium activities to accelerate social implementation of "Human-interaction platform technology".

PD: We launched the "Human-interaction Platform Technology Consortium" to rearrange platform technology modules developed through R&D for various sub-themes in our activities, match them with relevant needs and expand their utilization. In addition to companies/research institutes to develop platform technology, about 60 entities in total have joined including companies who integrate the technology into their own products, e.g., equipment vendors or content providers, and corporate users who locally utilize the products with platform technologies installed. As a result, we expect to understand the current demands from diverse industries and providing useful advice or technical consultation. Also, to publicize the findings of our research, we organize public symposiums, draft and promote strategic plans for standardization to allow social implementation. After the completion of the SIP project, we consider offering the platform technology modules and data, technical support, and test facilities as a package, aiming at continuous dissemination of the technologies.

Q: In the area of R&D for "Inter-domain data exchange platform technology", the organization called "DSA (Data Society Alliance)" was established to distribute and utilize data in collaboration with industry, academia and government.

PD: Currently, 128 companies, local governments and organizations are members of DSA, including private sector companies from a wide variety of domains such as telecommunication/IT, automotive manufacturers and electronics manufacturers. As many industries are facing challenges in sharing and utilizing data, we expect collaboration across industry, academia and government will lead to solve such issues. DSA is working on providing a platform service called "DATA-EX" to achieve data exchange across industries. We hope social implementation of the inter-domain data exchange platform technology will be promoted, when users integrate this service into their systems. Eventually, the appearance of the platform to create new services will contribute to continuously generate innovation in every industry.

R&D for inter-domain data exchange platform technology is positioned as a "Comprehensive Data Strategy" described in "the 6th Science and Technology Basic Plan" and "Strategic Plan for Realization of the Digital Society," and industry, academia and government is promoting this collaboratively.

Q: Nevertheless, it might be difficult for private companies to willingly share their data as the situation now stands.

PD: Absolutely. Data federation/sharing, especially confidential or personal information, is very difficult. To solve this issue, it is important to establish technology which enables big data analysis to be conducted in a decentralized manner, without collecting data and keeping it anonymous. As the first step, establishment of the distributed and federated data platform utilizing "Inter-domain data exchange platform technology" is vital. Furthermore, we intend to design R&D for data cleansing technology to analyze incomplete data as a future R&D theme to secure established technology, as it will become increasingly important.

Utilization of research results to overcome challenges during the COVID-19 crisis

Q: What is your opinion about the mission or expectations of your research during the COVID-19 crisis?

PD: Demands for AI utilization should grow in every policy making field including the measures against the pandemic, as AI is capable of quickly grasping the current situation and predicting the future. In order to collect and analyze hidden data in various places with the inter-domain data exchange platform, it is critical to steadily increase access points, and we believe our research will be of some help. In fulfilling our mission, we are either considering or have initiated collaboration with "SIP4D," the disaster prevention distribution network for "Enhancement of National Resilience against Natural Disasters" at the second period of SIP, data platform for "Intelligent Knowledge Processing Infrastructure Integrating Cyber and Physical Domains" and "Technologies for smart bio-industry and agriculture," and the MLIT (Ministry of Land, Infrastructure, Transport and Tourism) Data Platform.

Also, we promoted R&D for "Human-interaction platform technology" to utilize at customer service sites even before the pandemic. We believe it will be also useful for our new lifestyle, as we research and develop it as the platform technology, not as a mere application development. Thus, we work on utilizing platform technologies that accommodate new needs and forms at customer service sites.