Program Director Interview

PD Interview

12 Leading Experts Who Accelerate SIP

Social Implementation of IoT Enabling User-friendly Data Collection, Linkage, and Utilization

Solve social issues in various fields such as robotics and personal mobility

In constructing an IoT system, a wide variety of data must be collected and linked from physical spaces. We interviewed program director (PD) SASO Hideyuki, who is researching a "physical space digital data processing platform" to deliver an edge platform which includes sensor/telecommunication technology and information processing technology.

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The platform which provides end-to-end IoT systems

Q: To begin with, could you tell us about the edge platform?

PD: The edge platform is a platform which constructs and provides end-to-end IoT systems, by applying distributed processing called edge computing. In this method, communication load or delay can be prevented by processing data in places close to terminals rather than using servers in remote areas.

In realizing IoT systems, Cyber Physical System (CPS) is essential to link the data collected at physical sites with virtual space. However, various problems such as costs, human resources, security risks, etc., should be solved in constructing CPS and they are the bottleneck in dissemination of IoT. By utilizing "My-IoT," a foundation to develop the edge platform, we anticipate adoption of IoT will be advanced, as users will be able to construct a CPS easily even if they do not have technical knowledge.

Embarking on the demonstration phase for social implementation

Q: This is the fourth year for the second period of SIP. Could you share the research progress on the edge platform you are trying to realize with this research?

PD: For research of individual element technologies, we completed the prototype and we are now entering the stage of linkage.

We have initiated several demonstration experiments. For example, based on the integrated system architecture "My-IoT" where IoT systems can be developed, constructed and deployed easily, we construct a system for robotics operated by a team at the Ritsumeikan University. Another example is, based on "MSM Platform," which platformizes a Multi-Sensor Module (MSM) with multiple sensors and processors, we control expandable, sheet form flexible sensors developed by a University of Tokyo research group.

We need to combine those technologies for final social implementation, as element technology alone does not work as a system. Accordingly, operators are horizontally cooperating with each other, comparing and adjusting details seamlessly for social implementation.

Q: How are you proceeding with social implementation of the edge platform?

PD: We have launched a consortium to provide technical know-how for this research centering on "My-IoT". Now we are working on social implementation with start-up companies while small and medium-sized companies are taking the lead.

For example, for inspection of photovoltaic facilities, automated inspection and reporting using earphones-type IoT devices will be verified. This is expected to reduce the workload of operators.

Also, we are researching "robotic lawn mowers" and "IoT for instructors at sport gyms," etc., hopefully serving as the driving force to accelerate social implementation of "My-IoT".

In the field of robotics, we are engaged in demonstration experiments in collaboration with the industries which empha-

size labor productivity e.g., food-processing, manufacturing sites, dishwashing in the kitchen, etc., and require social distancing in work environments, which has become the new normal after "COVID-19". We are preparing for embodiment and systematization aiming at organizing a consortium in the future.

Q: Is there any research theme which has already entered the stage of practical application?

PD: SRF wireless PF, which regulates telecommunications at a site where various wireless standards intermingle and reduces interferences and delays, has entered the stage of practical application. Initially, we expected to spend four years on the research, however, we had a clear idea in commercializing it in three years. It will be utilized in the manufacturing field. Conventionally, when the production line changed, additional work was required for installing a new LAN cable. On the other hand, by utilizing SRF wireless PF, labor needed to change the production line will be significantly reduced, while good-quality telecommunication is guaranteed.

Demonstration experiments started in robotics and personal mobility

Q: Could you tell us about progress on your research regarding the MSM platform such as the combination or linkage with a sensor?

PD: We are researching two types of MSM platforms. First, a demonstration experiment for social implementation in the area where data relating to human movement/action and behaviors/activities is required, utilizing an expandable flexible sensor. Second, a demonstration experiment to handle soft vegetables such as a tomato with flexible hands that detect pressure. We just entered the stage of using the platform to coordinate sensor devices and actuators, and the research is progressing very well. We are providing MSM platform prototypes to companies in various business fields including Toshiba teams to collect more case studies that might be useful in all areas of industry.

Q: In which area(s) do you see significant progress compared to last year regarding the research theme for social implementation of technologies such as robotics and personal mobility vehicles?

PD: Actual initiation of various demonstration experiments would be the most significant progress we have made so far. Not only manipulating robotics alone, but we built a simple system based on the "My-IoT" and combined an MSM platform and a flexible sensor, etc. I believe we started focusing on such efforts to complete it as a full-scale system and it is important for social implementation.

For the personal mobility area, we executed a demonstration to carry people and drive on the sidewalk while controlling three personal mobility vehicles. We are also planning to conduct another demonstration to assist persons with limited mobility with transporting in public spaces such as an airport, etc.

Furthermore, we started engaging in activities to deploy soft IPs within the same industry this year. We hope to accelerate developing solutions for the transport of objects not only applying personal mobility technologies to the transport of people.

With data collection and linkage from physical spaces, add value and improve convenience

Q: In realizing Society 5.0, what other data do you think should be coordinated with data from physical spaces and utilized to create new values?

PD: There is a concept called "data federation" in which various data items are integrated and utilized. We need something like a "gate" to upload data when collecting and integrating data from physical spaces. We are currently investigating the specifications and planning to work on it this year for materialization.

I believe we will be able to improve values and convenience further by linking all types of data items in physical spaces with a "My-IoT" through data federation. Currently, we are rearranging the whole architecture to explore new values of the data obtained from physical spaces.