

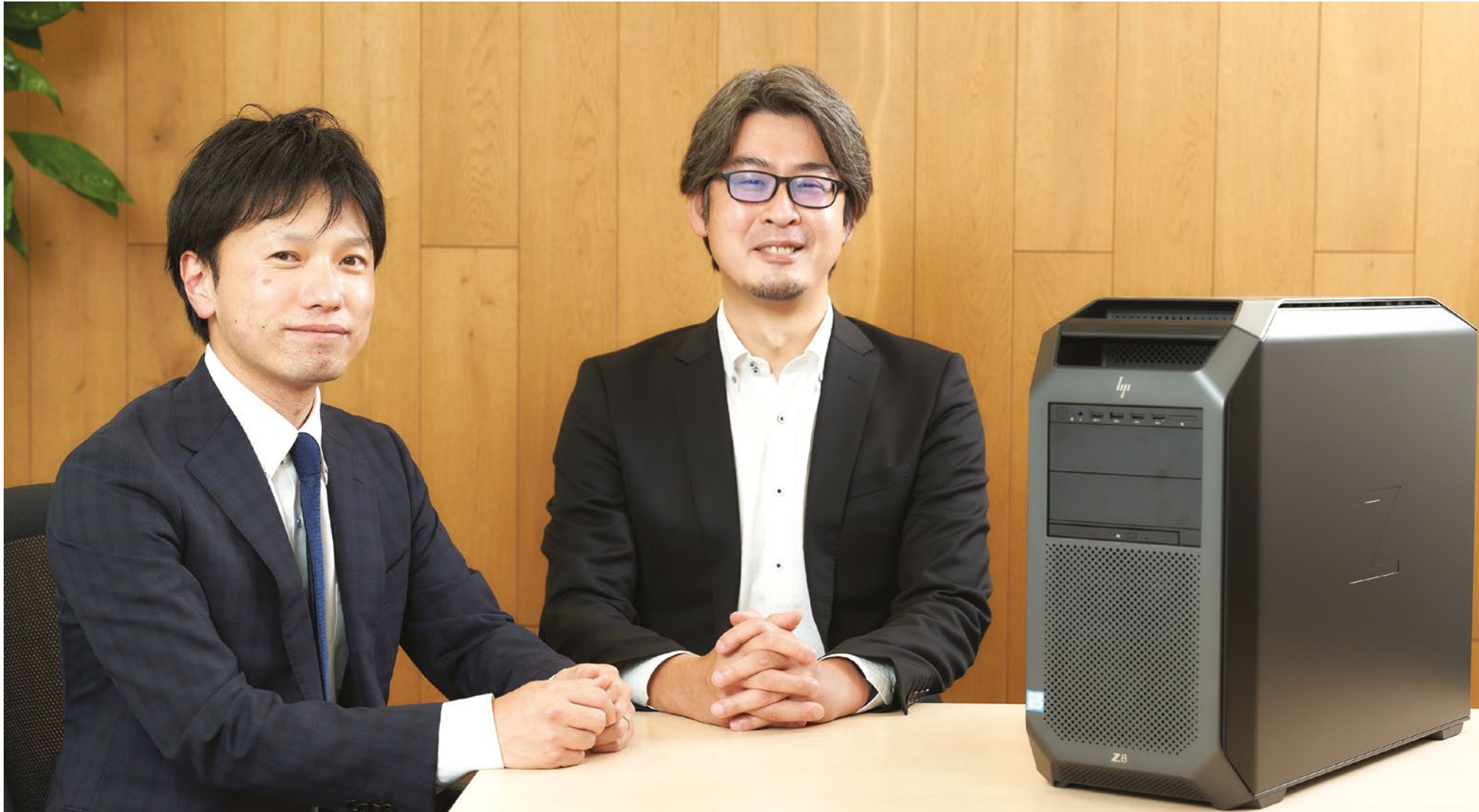
CASE STUDY  
ISP



ISP



EXPLORING THE POSSIBILITIES OF  
ARTIFICIAL INTELLIGENCE SOLUTIONS



As organizations increasingly recognize the value of artificial intelligence (AI), new needs continue to evolve. Research Institute of Systems Planning, Inc./ISP (ISP), which has been developing systems for over 40 years

and has been involved in AI since the dawn of the technology, has a history of providing solutions in various forms. The company is exploring further possibilities with AI in collaboration with HP.



## A system development expert

Research Institute of Systems Planning, Inc./ ISP (ISP) is a company that has been involved in the development, introduction and operation of systems that meet the needs of many organizations since it was established in 1977. Its services are not only used as a tool for convenience and efficiency of computer systems, but also to create an impact.

"I think it is an important mission not only to create a system for solving problems for companies, but also to provide consulting with an eye on the subsequent operation," says Tadaharu Inoue, 2nd Segment Manager at ISP's business headquarters.

The collaboration with HP began with a joint seminar held by both companies. Ideas for developing new solutions using AI were solicited.

"AI has become widespread in Japan as well, and I think we are moving from the stage of verification to the step of how to actually use it. With the reality that the number of companies

wishing to solve more practical problems is increasing, we decided to jointly promote this measure with HP," Inoue explains.

ISP oversaw system development, and HP helped test-develop an AI system by providing Z by HP equipment.

### Understanding damage with just one aerial photograph

Among many ideas, it was one proposed by the National Research Institute for Earth Science and Disaster Resilience and Keiyo Surveying Co., Ltd. that made the final cut.

When typhoon Number 15 crossed the metropolitan area on September 9, 2019, the area that was particularly damaged was the Chiba prefecture. At that time, Keiyo Surveying took an aerial photograph of the disaster area.

"The Disaster Resilience Research Institute suggested using that photograph for AI analysis to enable a quicker confirmation of the situation and the extent of damage," according to



Tomohiko Murase, Sub-Manager, 2nd Segment, at ISP's business headquarters.

Typically, in the event of a disaster, people walk the area to visually assess the situation. However, human resources tend to be limited, and the wider the scope of damage, the more time and effort are required. As a result, help might not reach victims in time. Necessary relief supplies, for example, could miss evacuation shelters.

If a disaster situation can be analyzed from the image by AI, the current damage can be assessed more quickly, saving resources, and prompting immediate response.

"It may seem difficult at first glance with a few clues, but we thought that our algorithm for visual inspection could handle it," Murase says.

ISP's visual inspection software "gLupe," often used in the manufacturing industry, can detect abnormalities with a small amount of normal data. This algorithm was used to pinpoint damaged homes in the project.

### HP Z8 G4 contributes to accuracy

On the computing end, the HP Z8 G4 was used to develop and verify the system. The Z8 desktop's Intel® Xeon® 8260 has a dual processor and 640GB memory and graphics—NVIDIA® Quadro RTX 8000, M.2 SSD 2TB. All these enhanced features contribute to the high-performing workstation's capabilities.

"The gLupe engine itself doesn't really need high performance, but this time we were going to analyze a huge image data, so the higher the performance, the better. The Z8 was a very reliable machine with GPU acceleration for high performance," Murase adds.

Since the task required applying an existing algorithm, the system was developed and customized quickly.

"It takes a lot of trial and error to let AI learn. The more processing power a workstation has with a high-end GPU like NVIDIA® Quadro RTX 8000, the faster the results will come out and the more trial and error there will be. I am very





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grateful that there is a machine able to perform at such an advanced development stage," Inoue says.

The attempts to detect the damage from a single aerial photograph showed a high accuracy of 70 percent or more in a short period of time.

"There are places that look like piles of rubble even in the natural terrain, and there are places that were originally abandoned houses and waste material storage areas. I felt that the results of the first test were sufficient," reflects Murase as he looks back on this measure.

### Z by HP Workstation accelerates AI system development

In addition to this project, ISP is using the Z8 high performance workstation as its own development resource.

"In our lab, we operate several workstations as shared assets for computing resources. Each staff member accesses them to perform high-load computations during development," Inoue says.

In addition to using the Z8's Microsoft operating system, ISP implemented Linux®-based Ubuntu® with dual boot and used it as an arithmetic machine for in-house development.



"Similar to the case of the National Research Institute for Earth Science and Disaster Prevention, when performing operations with deep learning, the higher the performance, the faster the results. The results show that a calculation that took two weeks in the past can now be completed in four days with the HP Z8," Inoue says.

He made full use of the Z8's 96 threads and used more than 500GB of 640GB of memory but found no abnormal heat generation or trouble during the trial. The Z8 G4 proved to be high-performing and reliable.

With plans for commercialization in the future, both the National Research Institute for

Earth Science and Disaster Resilience and Keiyo Surveying have informed ISP that they obtained sufficient results to fuel practical application.

"This time, we performed image analysis with AI using only one aerial photograph as a clue in a short period of time. However, if we combine information on the height of land and buildings, photographs before the disaster, and identification of houses, we can do even more," Murase says. "The accuracy will increase. It will be useful for local governments and disaster victims because it will be possible to check the current situation more quickly and accurately in the event of a disaster."



Inoue concludes, "It was very inspiring to see that the algorithm we developed could meet new requirements. As I learned from this project, we leave the systematization to the computer and people concentrate on being more creative. I realized how important it is to do this. I would like to continue contributing to society by creating a system that allows more people to spend time meaningfully."

ISP has also introduced HP ZBook Firefly 14 G7 mobile workstations with NVIDIA P620 GPU. This enables the team to work remotely, especially during the pandemic.

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