

Collaborative AI robots for adaptation of diverse environments and innovation of infrastructure construction

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R&D institutions

Japan Aerospace Exploration Agency, Osaka University, Kyushu Institute of Technology, Kyushu University, Keio University, Kogakuin University, Kokusai Kogyo Co., Ltd., University of Tsukuba, Tokyo Institute of Technology, The University of Tokyo, Tohoku University, Public Works Research Institute, Nara Institute of Science and Technology, Seikei University, RIKEN

Summary of the project

We will conduct research and development on 'collaborative AI robots' capable of adapting flexibly to unexpected situations in hazardous environments, such as lunar surfaces and disaster sites. By 2050, these 'collaborative AI robots' will be able to replace humans and achieve emergency restoration in natural disasters and the construction of lunar bases. This technology will also be beneficial for constructing and maintaining infrastructure on Earth. In addition, developed technologies can be applicable to the earth such as natural disasters and etc.

Milestone by year 2030

We will develop a multi-robot system of collaborative AI robots that can adapt flexibly to unexpected situations, which will be helpful for disaster mitigation scene (such as river channel blockage) and lunar infrastructure construction.

Milestone by year 2025

We will develop a prototype of collaborative AI robots that can adapt flexibly to unexpected situations, which will be helpful for disaster mitigation scene (such as river channel blockage) and lunar infrastructure construction.

R&D theme structure of the project

This project aims to achieve infrastructure construction adaptable to diverse environments using a collaborative AI robot system. As illustrated in Figure 1, we have identified three research and development objectives to accomplish this goal:

1. Robot Hardware for Earthwork Innovation,
2. Dynamic Collaboration System for Multiple Robots, and
3. Sensor Pod System to obtain environmental information.

We are currently making simultaneous progress in research and development across these three areas.

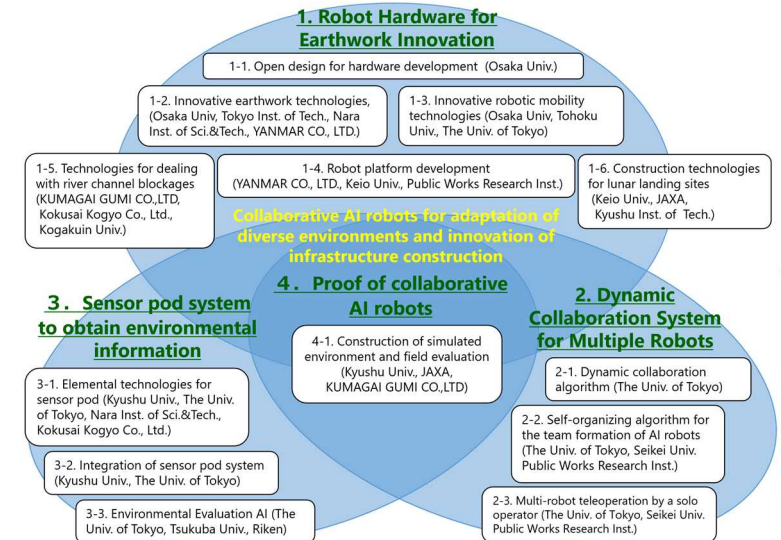


Fig.1 Research sub-themes and members.

After 2023, we will integrate the component technologies from the aforementioned research and development and verify the hardware and operational algorithms in a simulated field. Furthermore, we will conduct an environmental evaluation using real data.