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Launching R&D on a Software Development Platform for Construction Robotics

~Building a Common Platform to Enable Seamless Robot Collaboration and Accelerate Digital Transformation in the Construction Industry~

Kudan Inc. (CEO: Daiu Ko), TAKENAKA CORPORATION (President: Masato Sasaki), JIZAIE Inc. (CEO: Junki Nakagawa), Asratec Corp. (President & CEO: Masato Sakatani), Akari Inc. (CEO: Yuki Noro), and SENSYN ROBOTICS, Inc. (CEO: Takuya Kitamura) have jointly launched research and development (R&D) ※1 ※2 of a software development platform for construction robotics.

This R&D initiative will build an open development platform enabling diverse robots at construction sites—such as those for material transport, fireproof coating, surveying, and cleaning—to use common functional modules in combination. This will allow robot manufacturers and system integrators to freely add and expand modules, helping to address the shortage of skilled workers and accelerate the adoption of robotics in the construction industry.

※1 This project is being conducted under NEDO's (New Energy and Industrial Technology Development Organization) "Research and Development Project of the Enhanced Infrastructures for Post-5G Information and Communication Systems: Building a Software Development Platform for Robotics" (commissioned)
https://www.nedo.go.jp/news/press/AA5_101875.html (Japanese only)

※2 Kudan Selected for NEDO's Open Call: "Research and Development Project of the Enhanced Infrastructures for Post-5G Information and Communication Systems: Building a Software Development Platform for Robotics"
https://contents.xj-storage.jp/xcontents/AS02977/418334e1/977c/409b/99be/f667f4dbe7f9/140120250802528175.pdf

Background of the Development

The construction industry is facing a serious shortage and aging of skilled workers, raising expectations for solutions through Robotics Transformation (RX) technologies. However, at present, each vendor develops its own robots independently, creating challenges such as a lack of interoperability and high development costs.

Building on the expertise accumulated through the activities of the Construction RX Consortium ※3 (comprising over 300 member companies as of the end of August 2025), there is an urgent need to establish an open development platform to address these issues.

※3 A private-sector organization established to promote Robotics Transformation (RX)—the use of construction robots, IoT applications, and related technologies—to address critical challenges facing the construction industry, such as a declining workforce, and the need to improve productivity and safety

Overview of the Development

Through the following six research and development initiatives, we will build a software development platform for construction robotics.

1. Overall Architecture Design (TAKENAKA)
   - Designing an architecture that integrates all components of a robot, from mechanical hardware to software
   - Creating an architecture that can be commonly used across robots from different manufacturers
2. Software Function Development (Kudan)
   - Developing technologies that enable robots to accurately recognize their position and navigate autonomously, even at constantly changing construction sites
   - Building systems that allow multiple robots to coordinate and perform tasks efficiently.
3. Hardware Function Development (JIZAIE)
   - Developing a standardized mobile unit adaptable to various construction tasks
   - Designing a structure that enables easy installation and replacement of sensors and control devices
4. Communication Infrastructure (Asratec)
   - Establishing a stable communication system combining multiple methods such as 5G, Wi-Fi, and mesh networks
   - Developing a communication platform that flexibly adapts to environmental changes at construction sites (e.g., varying obstacles).
5. Pre-Verification Technology in Virtual Space (Akari)
   - Reproducing actual construction sites with high precision in a computer environment to test robot operations in advance
   - Creating realistic work environment simulations linked with building design data (BIM/CIM).
6. Operational Support and Management Tools (SENSYN ROBOTICS)
   - Developing a management system for centralized monitoring and control of multiple robots
   - Providing a standardized interface that enables unified operation of robots from different manufacturers

Future Outlook

This R&D initiative aims to reduce the development and operational costs of robotic systems. In collaboration with the “Digital Robotics System Technology Platform Project,” we will verify the practicality of the platform through demonstrations involving multiple robotic systems.
Looking ahead, the platform established in the construction industry will be extended to other sectors, contributing to strengthening the international competitiveness of Japan’s robotics industry.

About Kudan Inc.

Kudan leads the advancement of next-generation solutions such as robotics, autonomous driving, and digital twins through research and development, as well as the provision of spatial

perception algorithms that connect the physical and digital worlds. Originating from the United Kingdom, Kudan is a global company that, with innovative artificial perception technology (the "eyes" of machines) at its core. By extending the application of artificial intelligence from the digital space into the physical space, Kudan aims to fundamentally solve social issues and dramatically improve productivity by promoting automation, unmanned operation, and remote accessibility across all industries.
For more information, please refer to Kudan's website at https://www.kudan.io/.

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