Moonshot Goal 3
“Realization of AI robots that autonomously learn, adapt to their environment, evolve itself in intelligence and act alongside human beings, by 2050.”

Dr. FUKUDA Toshio

Professor, Meijo University

IEEE Post President and CEO

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1. Motivation

Considering Japan's declining birthrate and aging population, robots are needed in all aspects of society - working in dangerous or understaffed sites, developing human frontiers, and supporting our everyday lives.

Robots must be able learn and act on their own through the co-evolution of AI and robots. Our R&D aims to realize AI robots with advanced bodies and self-developed AI learning.

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2. Our goal

A society where humans and robots live together.

By 2050, we will develop AI robots that have the same or greater sensibilities and physical abilities than humans, and grow together with humans.

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3. Our vision

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3. Our vision

- Partner AI robots will grow with owners from cradle to grave, and enhance the quality of human lives.

- Partner AI robots will watch over children, perform health management and nursing-care, and provide a variety of support for humans, customized for personality and age.

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3. Our vision

- AI robots will gain the ability to repair themselves, correct their own errors through experience, and improve their capabilities.
- AI robots will make their own scientific discoveries by thinking and acting autonomously. They will also inspire humans to make new discoveries too.
- AI robots will work autonomously in extreme environments, protecting human lives.

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4. Projects (1)

Project Manager (PM):

SUGANO Shigeki

Professor, Faculty of Science and Engineering, Waseda University

Smart Robot that is Close to One Person for a Lifetime

This project aims to establish robot evolution technology that combines flexible machine hardware and unique AI that can understand many kinds of tasks. Our final goal is to build a human-robot symbiotic society by introducing a general-purpose AI robot that can work with people not only in housework and customer service but also in welfare and medical fields where human resources will be in short supply by 2050.

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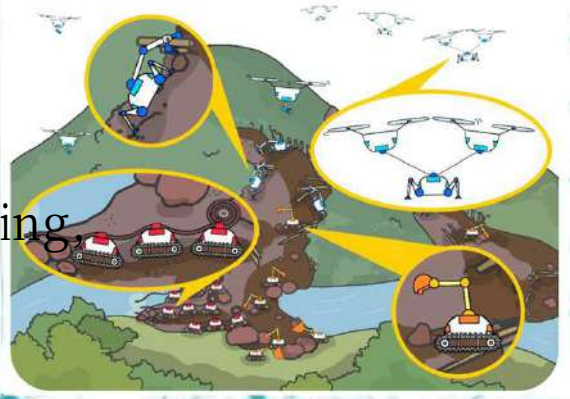
4. Projects (2)

Project Manager (PM):

NAGATANI Keiji

Project Professor, School of Engineering,
The University of Tokyo



Innovation in Construction of Infrastructure with Cooperative AI and Multi-Robots Adapting to Various Environments

This project aims to develop collaborative AI robots that respond to various situations flexibly and perform given tasks in challenging environments such as disaster sites or the moon. By 2050 these collaborative AI robots will, on behalf of humans, conduct emergency response missions following natural disasters and construct lunar bases. This technology will also be useful for the construction and maintenance of ground infrastructure.

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4. Projects (3)

Project Manager (PM):

HARADA Kanako

Associate Professor, Graduate School of Medicine, Graduate School of Engineering, The University of Tokyo

Co-evolution of Human and AI-Robots to Expand Science Frontiers

This project aims to develop AI-robots that conduct scientific experiments in challenging environments (e.g. in a hazardous atmosphere, or in a micro-scale setup), while interacting with scientists as their peers. AI robots and scientists will have freer interactions, and will work with unfamiliar objects and environments through trial-and-error together. By 2050 AI-robots will discover their own principles and solutions in the science fields.

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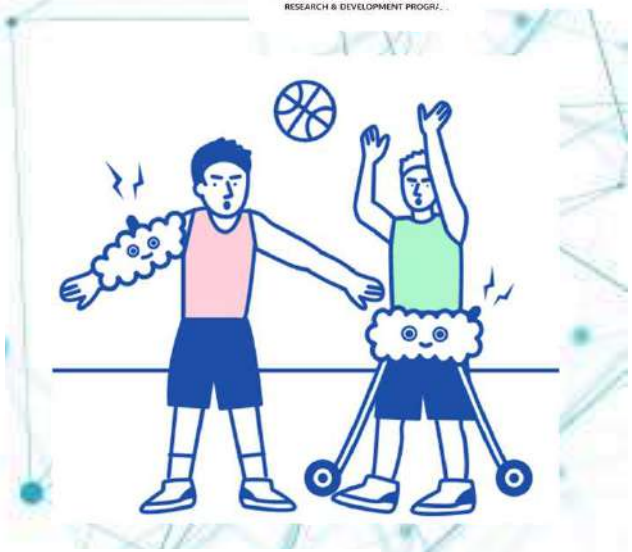
4. Projects (4)

Project Manager (PM):

HIRATA Yasuhisa

Professor, Graduate School of Engineering, Tohoku University



Adaptable AI-enabled Robots to Create a Vibrant Society

This project aims to create a collective of adaptable AI-enabled robots available at a variety of places. Each robot will be usable by anyone at any time, and will adjust its form and functions according to the individual user to provide optimal assistance and services. By 2050 the co-existence and co-evolution of a wide variety of robots and people will create a vibrant society in which all people can participate.

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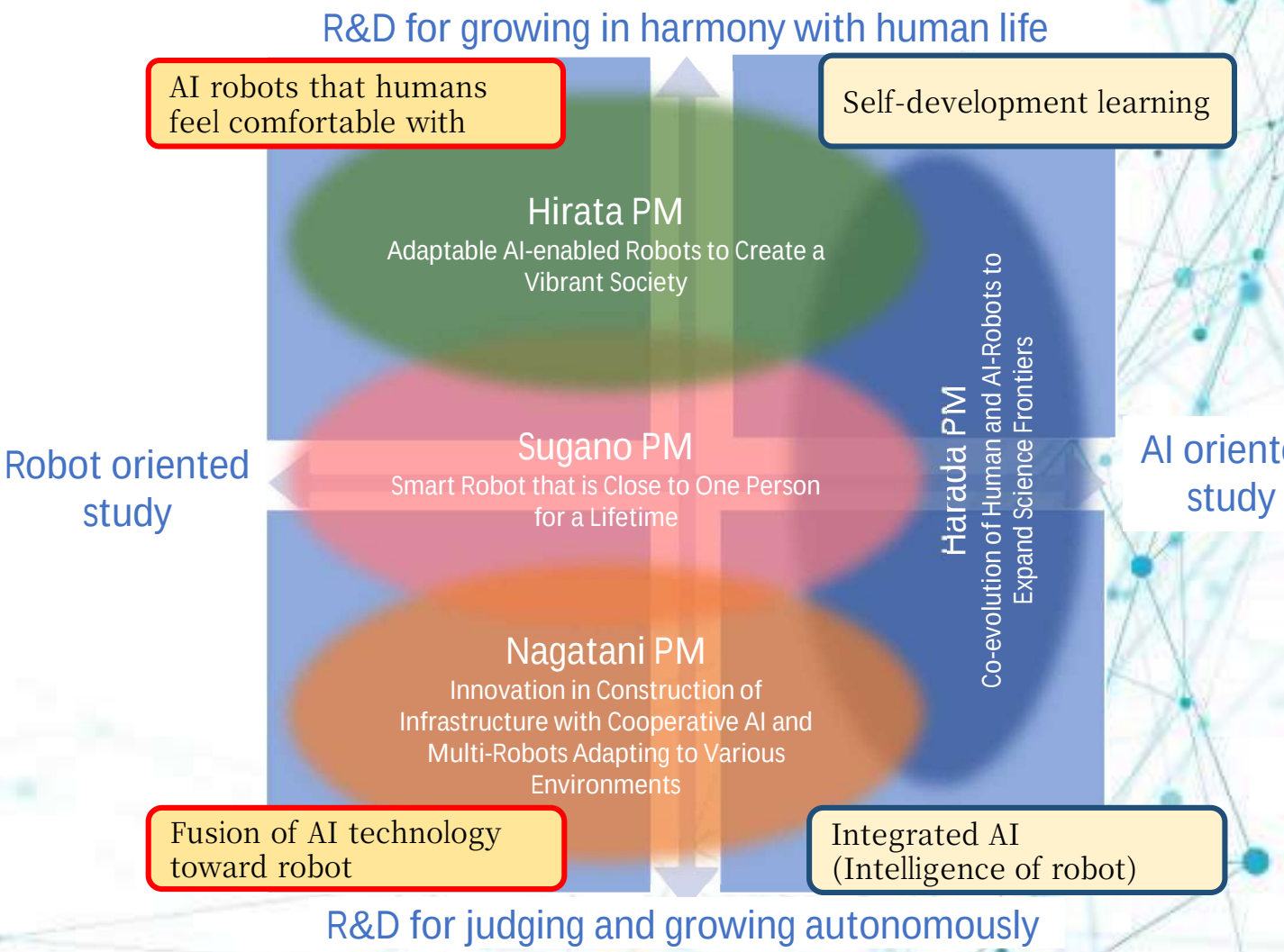
5. R&D process



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6. For the future

- ✓ Propel cutting-edge R&D efficiently by promoting cooperation with overseas organizations (NSF/Horizon Europe/Australia/ IROS, and more).
- ✓ Cooperate with companies, aiming for social implementation according to the progress.
- ✓ Discuss social acceptability of AI robots (including safety and security and ELSI perspectives).
- ✓ Hold regular events drawing out synergistic effects through cooperation between PMs and PIs within Goal 3, meetings and workshops in collaboration with other MS Goals (especially Goal 1).

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Thank you for listening!

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