Development and promotion of AI-powered collaborative robots in Japan

Dec.11.2025

New Energy and Industrial Technology Development Organization

Technology and Innovation Strategy Center

Director General, Digital Unit

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Agenda

1. NEDO Overview
2. Technology and innovation Strategy Center (TSC) Overview
3. An AI Robotics Program in NEDO
4. AI Robot Association (ARoA)
5. Conclusions

1. NEDO Overview

NEDO Overview

- NEDO supports technology development to address energy and global environmental problems and to enhance Japan's industrial technology through commissioned projects and subsidies.
- NEDO aims to turn the results of technological development into real-world applications by leveraging the capabilities of the private sector. To achieve this, NEDO identifies socially relevant technologies by monitoring trends both in Japan and abroad and provides broad support, from building business models to formulating management strategies.
- NEDO also fosters cooperation between industry, academia, and government.

Funding Allocated

1.4631 trillion yen
(FY2024)

Budget
(excluding funding programs)

146.4 billion yen
(as of April 2025)

Projects

71
(as of April 2025)

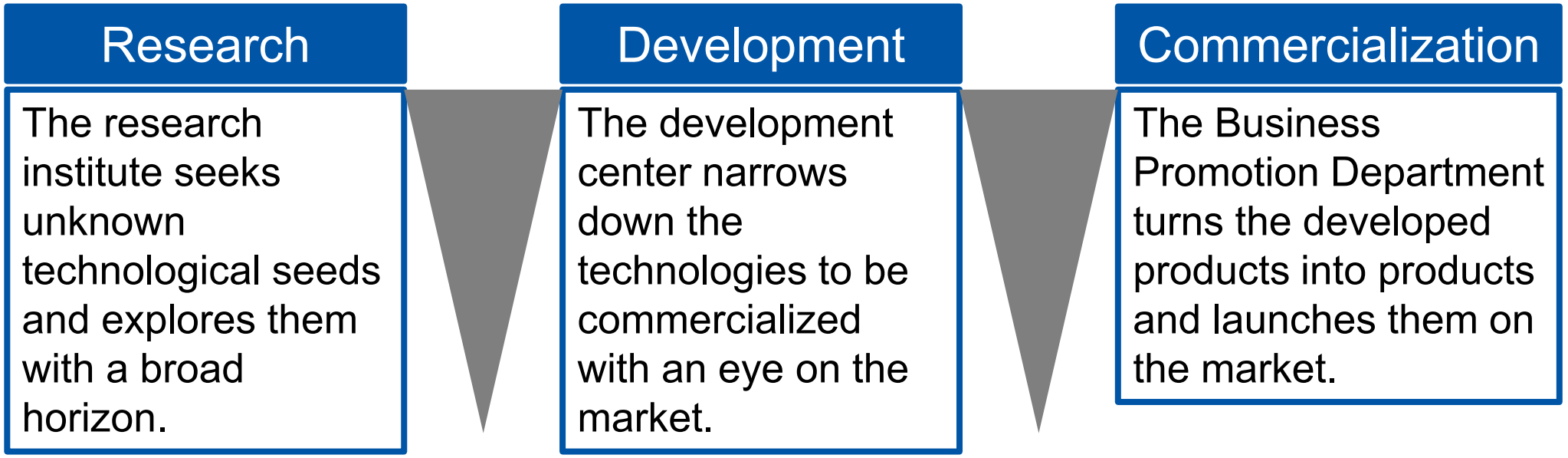
Global Activities

18 countries
(as of April 2025)

Personnel

1,565
475 with master's degrees and 78 with PhDs
(as of April 2025)

NEDO Mission



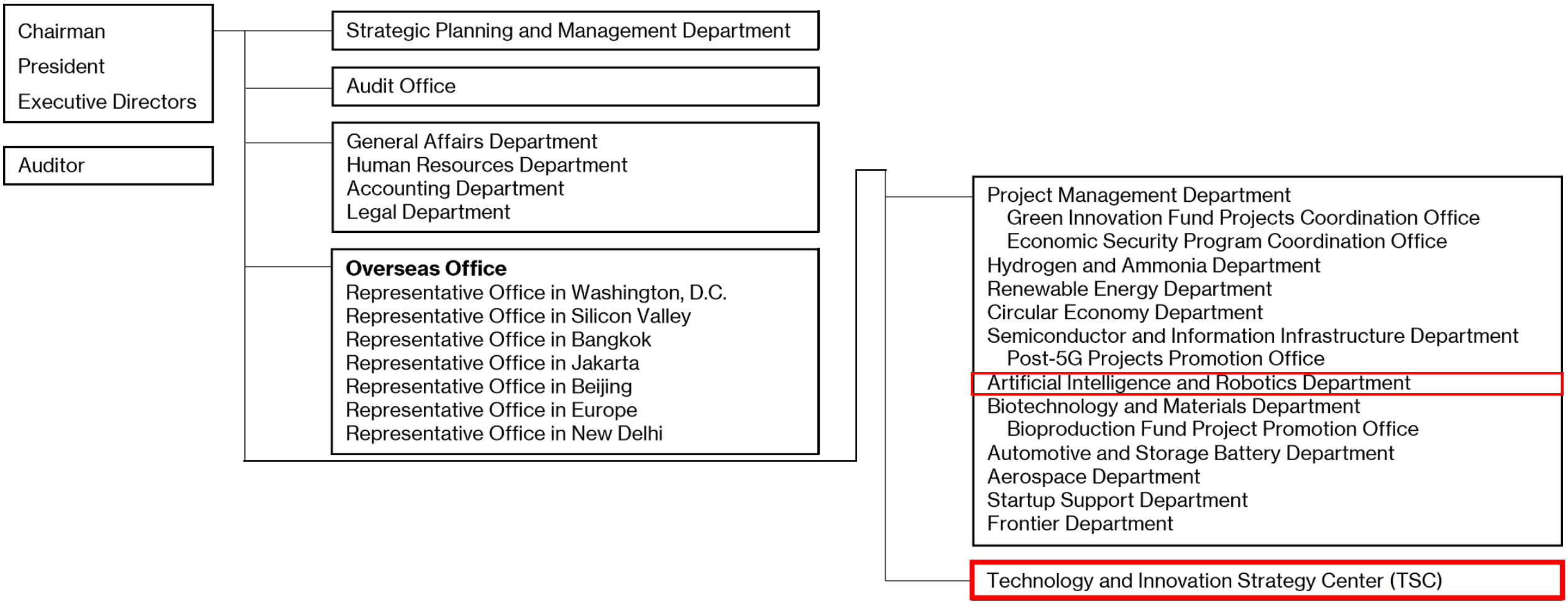
Pioneering research and narrow-down development are activities with completely different vectors.

Further management decisions such as customer service are required to enter the market.

Help cross the "valley" before and after "development".

※図の出典:「技術経営の考え方～MOTと開発ベンチャーの現場から～」(出川通)をNEDOにて加工

Organization



2. Technology and innovation

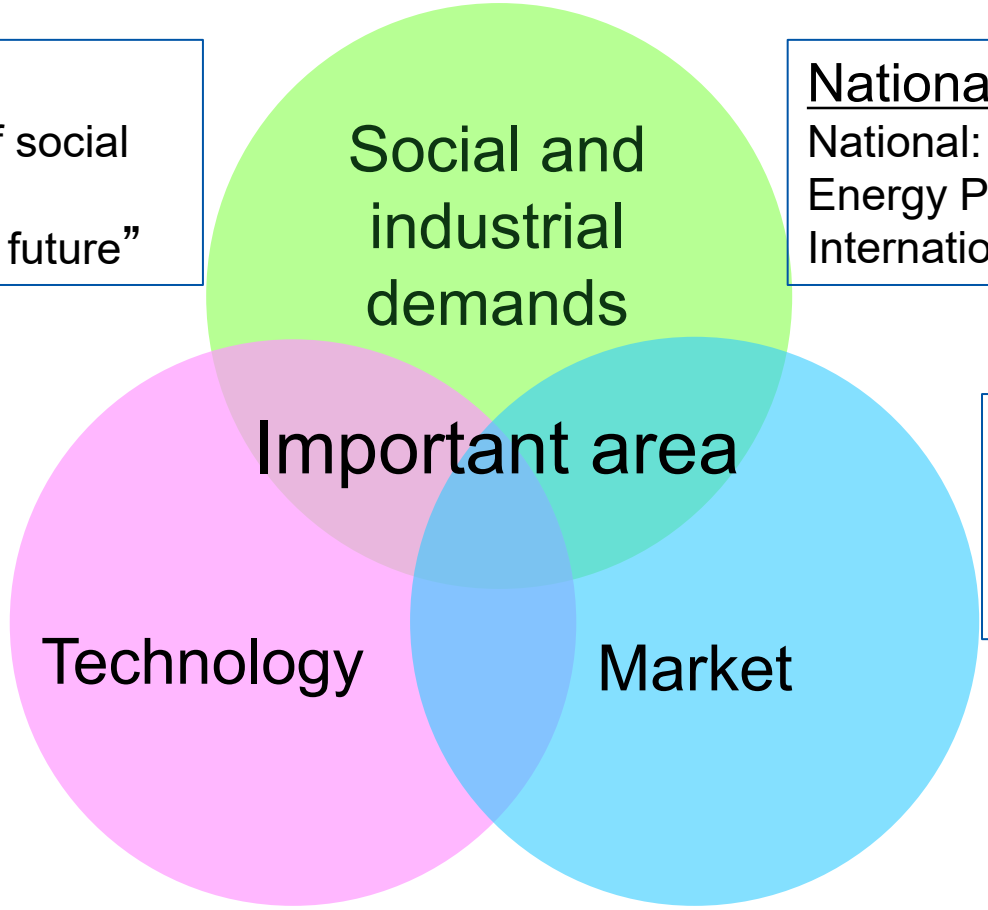
Strategy Center (TSC) Overview

Technology and Innovation Strategy Center(TSC)

As a think tank division of NEDO, TSC analyzes technical areas that should be addressed from the perspective of global markets, industries, policies, and technologies.

Global Social Issues
Systematization and structuring of social issues
TSC Future Image “A prosperous future”

National and International Policy Trends
National: Integrated Innovation Strategy, Basic Energy Plan, etc.
International: Policies of US, EU, China, etc.



Trends in Advanced Technologies and Companies and Research Institutions
Publications and Patent Trends, NISTEP Delphi Survey, CRDS Overlook Report, etc.

Global Market Trends
Survey on the International Competitive Position of Japanese Companies

Innovation Outlook

The Innovation Outlook formulated by the TSC provides a bird's-eye view of technology, markets, and policy trends in each field to realize the future while solving social issues and **proposes areas in which Japan should work on new areas (frontier areas) or areas where efforts should be strengthened**.

Contents

1	**Introducing *Innovation Outlook*** Background and Significance
2	**TSC's Vision of the Future**
3	**Social Challenges and Frontier Areas** 1:Sustainable Energy 2:Environment and Green Chemistry 3:Agri-Food Tech 4:Digital Field 5:Materials Field 6:Bioeconomy
4	**Future Challenges**

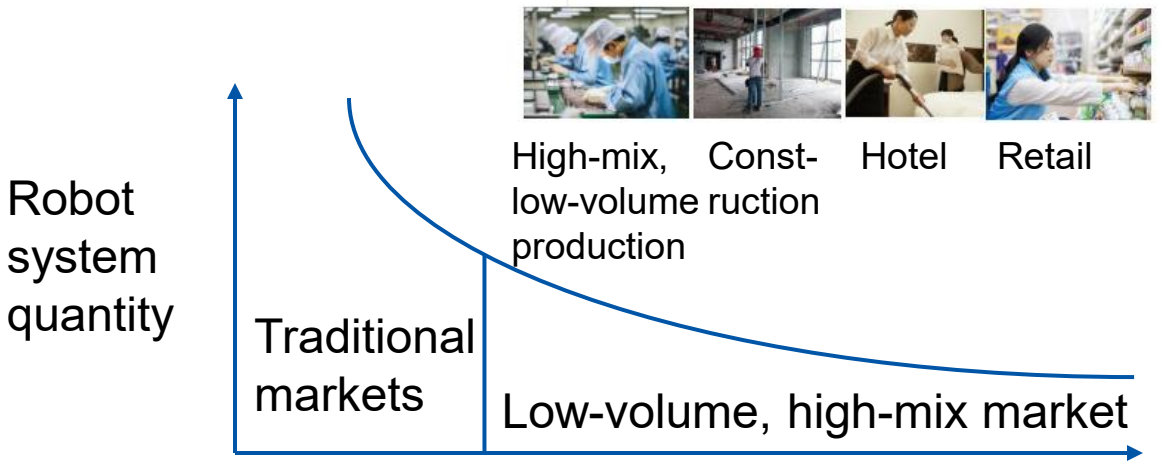
Innovation Outlook Download Site

https://www.nedo.go.jp/activities/tsc_activity.html

3. An AI Robotics Program in NEDO

Efforts to solve social issues using AI and robotics

- While conventional robotics are reliable in accurately and stably performing fixed tasks in a certain environment, they lack flexibility in development and make autonomous decisions in different environments. Therefore, in order to respond to the low-volume, high-mix market (long-tail market), it is necessary to develop each robot according to individual needs, and difficulties arise due to the long development period and high cost structure.
- In order to solve the high cost structure of robots, it is essential to develop versatile robots that can be used in a variety of use cases. With the development of AI, we can expect to develop multi-purpose robots that can realize a variety of movements and respond to complex environments where we interact with people.



[出所：経済産業省 AIロボティクス検討会とりまとめ 参考資料より] (Japanese only)
https://www.meti.go.jp/shingikai/mono_info_service/ai_robotics/pdf/20251008_2.pdf

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The direction of AI robotics strategy (METI)

For the development, implementation, and market entry of multi-purpose robots, we will focus on the supply and demand sides, and examine Japan's strengths and weaknesses, as well as the winning strategies and necessary countermeasures that can be seen from them. At that time, since the maturity of each technology and product and the development of the environment in the industrial domain are different, it is important to be aware of the time axis in the AI robotics strategy and organize it by phase.

Supply side

- In anticipation of the advancement of AI and the transition to SDR (Software Defined Robot), we will train domestic OEM manufacturers and SIers of multi-purpose robots, identify important hardware components and software stacks from the perspective of strengthening industrial competitiveness and economic security, and consider appropriate support measures.
- After analyzing these global supply chains and risk factors in detail, we will organize the direction of the industrial structure that should be in the future and the functions and capabilities required of each operator.

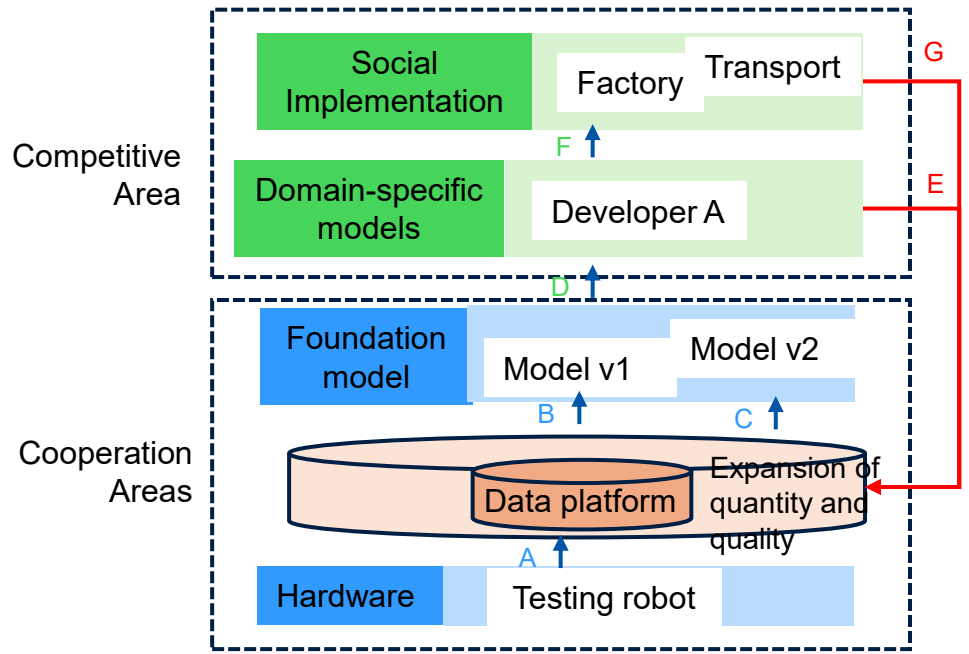
Demand side

- We will analyze the reasons for the slow spread in each market domain in long-tail areas such as high-mix, low-volume manufacturing, construction, medical and nursing care, retail, logistics, and agriculture, as well as in the public domain such as disaster prevention and infrastructure. In addition to appealing for added value according to market needs, we will organize the market domains that should be introduced in advance and the conditions for their introduction, and consider appropriate support measures.

[出所：経済産業省 AIロボティクス検討会とりまとめ 資料より] (Japanese only)
https://www.meti.go.jp/shingikai/mono_info_service/ai_robotics/20251008_report.html

Development of a data platform for the development of generative AI foundation models in the field of robotics

Generative AI has the potential to perform various creative tasks on behalf of humans, so it is a technology that will be the key to improving productivity and creating innovation in Japan's industry in the future. It is also believed to have a significant impact on industrial activities and people's lives, and is positioned as a killer application in the post-5G era. In this project, we will work on the research and development of a data platform that is effective for the development of generative AI foundation models in the field of robotics through data collection, foundation model development, and demonstration in the field of implementation. In addition, the results will be made as open as possible and widely returned to the development of generative AI foundation models in the field of robotics in Japan.



G) Returning the created data to the data platform

F) Social implementation of individual models

E) Models and data are used to reduce certain data to the data platform

D) Develop domain-specific models based on foundation models

Promoting the participation of diverse players in Japan and abroad

C) Improve foundation model performance with newly acquired data

B) Developing foundation models in the physical field using data platform

A) Data collection in the physical field, which is overwhelmingly lacking

The AI Robot Association (AIRoA)

4. AI Robot Association (AIRoA)

AI Robot Association（AIRoA）

Established in December 25, 2024

AIRoA
AI Robot Association

Value

AI X Robot	• Bridging AI and robotics communities • Developing general purpose platforms for AI and robotics
Open	▪ Creating open platforms and datasets for robotics foundation models ▪ Autonomous contributions from the R&D community
Global	▪ Developing worldwide software and data platforms

Objective

By integrating robots and AI, AIRoA aims to revolutionize robot development technologies and drive their broader adoption in society.

Main Activities

- Advancement of AI Robot Development
  1. Collecting, storing, managing, and publicly disclosing data necessary for foundational model development
  2. Developing, operating, and publicly sharing foundational models and individual models
  3. Facilitating a vibrant development
- Promotion of AI Robots in Society
  1. Measuring and publicizing the efficiency gains achieved by AI robots
  2. Assessing and publishing AI robot safety evaluations

NEDO Project

Development of a data platform to create generative AI foundation models in the field of robotics （Oct. 1, 2025 – Aug. 31, 2029）

AIRoA started research and development of a data platform to create robotics foundation models.

Goal

- Integrating technologies related to large-scale learning, multimodal data processing, and robot systems owned by each company to build a highly competitive platform.
- Developing robotics foundation models that can be used in industries such as retail, manufacturing, and logistics.
- Contributing to the establishment of an industry-specific AI Robot ecosystem from Japan and raising the level of the entire robot industry.

Research theme

- Automatic AI model generation technology
- Integration of multiple data sources
- Examples of application cases

Participating Institutions

- Telexistence Inc.
- ABEJA, Inc
- National Institute of Advanced Industrial Science and Technology
- University of Tokyo
- Kyushu Institute of Technology
- Shimizu Corporation
- Daiwa House Industry Co., Ltd.
- Mitsubishi Electric Corporation
- WASEDA University

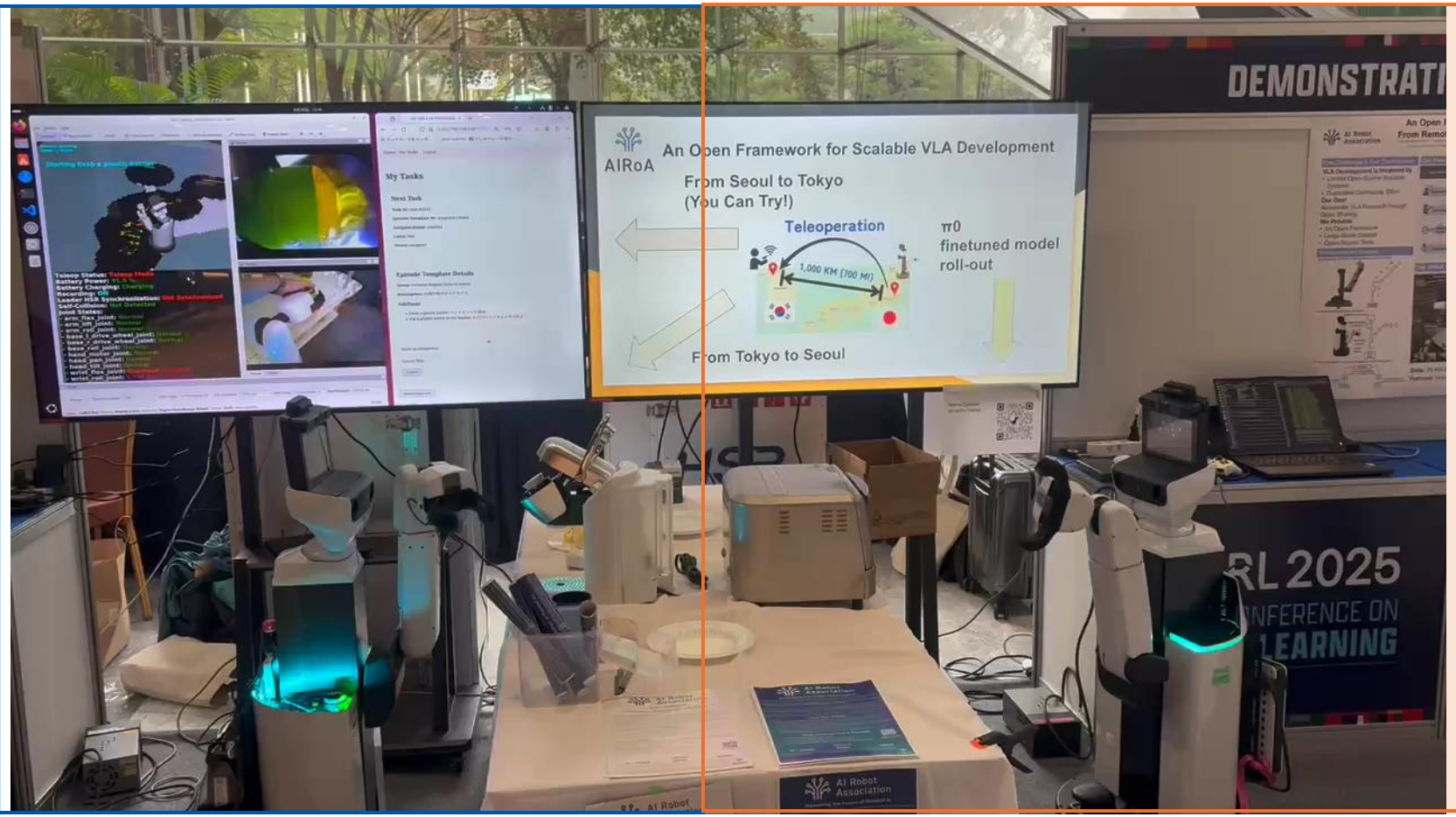
CoRL2025: Demonstrations that mimic the process of VLA development

VLA development process

Data collection → Model Learning (Prepared in advance due to time constraints) → Model deployment

Point

- Teleoperation from Tokyo to South Korea (expanding possibilities for future data collection)
- Robot performed complex tasks, such as operating a coffee maker



Point

- Finetuning the π0 with pre-collected data obtained from Tokyo and deploying it (opening the microwave)
- Operates successfully in new environments without training on South Korean data (a certain level of generalization is recognized).

5. Conclusions

Conclusions

- NEDO is strongly supporting R&D and promotion of AI-powered collaborative robots in Japan.
- NEDO and AIRoA will jointly promote the participation of diverse players in Japan and abroad including Spain in the development and implementation of domain-specific models based on robotics foundation models developed in NEDO project.

NEDO SNS Account

We are sharing various latest information such as press releases, public calls, and event updates. Please be sure to follow and register with us!

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