

EDUCATION

- 2016.4 - 2020.3 **Keio University**
BA in Applied Physics and Physico-Informatics
Kanagawa, Japan
- 2020.9 – 2026.6 **Okinawa Institute of Science and Technology Graduate University**
Ph.D. in Computer Science – Cognitive Neuro-robotics Research Unit
Okinawa, Japan

RESEARCH EXPERIENCE

- 2026.4 - present **Sony Computer Science Laboratory, Humanity Science Project**
Project Researcher
Tokyo, Japan
Body Integration Learning Framework for Highly Skilled Robots
 - Leading the setup of physical human-robot interaction experiments using the open-source humanoid robot “OpenArm” (Enactic).
- 2025.1 – 2025.7 **Équipes Traitement de l’Information et Systèmes Lab**
CY Cergy Paris University
Prof. Alexandre Pitti, Prof. Mathias Quoy
Cergy, France
Investigation of Robust Predictive-Coding inspired Recurrent Neural Network in Real Robot Tasks
 - Proposed CERNet, a hierarchical predictive-coding RNN with class embedding, enabling unified real-time motion generation, recognition, and meta-inference of confidence.
 - Demonstrated stable reproduction of 26 handwritten alphabet trajectories and confidence estimation using the Reachy humanoid robot (Pollen Robotics) in both simulation and real-world settings.
 - Accepted for *Proceedings of the IEEE International Conference on Robotics and Automation (ICRA), 2026* [3].
- 2021.9 – 2026.6 **Cognitive Neuro-robotics Research Unit**
Okinawa Institute of Science and Technology Graduate University
Prof. Jun Tani
Okinawa, Japan
Human-Robot Kinaesthetic Interaction Based on the Free Energy Principle
 - Investigated human-robot kinaesthetic interaction using a predictive coding-inspired variational RNN, guided by the Free Energy Principle, to model bidirectional sensorimotor dynamics between humans and a humanoid robot.
 - Through mutually adaptive physical behaviors through active inference, conducted research on revealing the relationship between kinaesthetic perception and the internal state of the employed variational RNN [1].
 - Studied the emergence of novel behaviours through incremental learning with variational RNNs [2].
- 2019.7 - 2020.1 **Quantum Materials Science Unit**
2021.1 - 2021.4 **Okinawa Institute of Science and Technology Graduate University**
Prof. Yoshinori Okada
Okinawa, Japan
Evaluation of magnetic properties in van der Waals compounds

- Evaluated the magnetic properties of van der Waals compounds CeTe₃ and CeTe₂Se (collaborated with Dr. Daichi and Yuita). Results published as a full journal paper [4].

2019.4 – 2020.3

Matoba & Kamihara Lab

Keio University

Prof. Masanori Matoba, Prof. Yoichi Kamihara
Kanagawa, Japan

Synthesis of layered oxysulfide to optimize thermoelectric properties

- Synthesized a polycrystalline LaCuS_{0.5}Se_{0.5}O which is expected to have high thermoelectric properties for the first time.
- Evaluated the effect of copper deficiency in the polycrystalline to its thermoelectric properties. Results published in a full journal paper [5, 6].

Working Experience

2026.3 – 2026.4

Mercor

Bilingual Japanese STEM Expert Writer & Editor

Tokyo, Japan

Designing scientific prompts and evaluation frameworks for AI systems

- Designing Prompt-Rubrics for evaluating LLMs in the fields of science and engineering.
- Engaged in work as both a prompt creator (Writer) and an evaluator (Editor).

2023.9 – 2026.3

R&D Engineer

Reazon Holdings, Inc.

Tokyo, Japan

Development of Automatic Minutes Sender Bot Using LLM and NLP

- Full time software engineer (4 days/week) with permanent employment status.
- Lead engineer for an automated meeting-minutes distribution system that integrates LLMs and NLP; authored over 95% of the code. The system is now running in production within the company.
- Built a scalable backend leveraging AWS EC2, S3, SageMaker Asynchronous Inference, Lambda, and other services to enable asynchronous inference.
- Designed and developed a RAG-based GPT agent capable of answering complex queries regarding internal company policies and regulations. Improved internal knowledge accessibility and employee self-service efficiency.

Publications and Presentations (all peer-reviewed)

- [1] **Hiroki Sawada**, Wataru Ohata, and Jun Tani. "Human-Robot Kinaesthetic Interaction Based on The Free Energy Principle." *IEEE Transactions on Systems, Man and Cybernetics: Systems* (2024).
- [2] **Hiroki Sawada**, Jun Tani. "Incremental Learning in Physical Human-Robot Interaction Using Predicting Coding-inspired Variational RNNs." *IROS (IEEE/RSJ International Conference on Intelligent Robots and Systems)*, late breaking poster (2024).
- [3] **Hiroki Sawada**, Alexandre Pitti, Mathias Quoy. "CERNet: Class-Embedding Predictive-Coding RNN for Unified Robot Motion, Recognition, and Confidence Estimation." *Proceedings of the IEEE International Conference on Robotics and Automation (ICRA)*, 2026.
- [4] Ueta, Daichi, Riki Kobayashi, **Sawada Hiroki**, et al. "Anomalous Magnetic Moment Direction under Magnetic Anisotropy Originated from Crystalline Electric Field in van der Waals Compounds CeTe₃ and CeTe₂Se." *Journal of the Physical Society of Japan* 91.9 (2022): 094706.
- [5] Azuma Nobuhiko, **Sawada Hiroki**, Itoh Houji et al. "Thermal transport properties of a mixed anion layered compound, polycrystalline LaCu_{1-δ}S_{0.5}Se_{0.5}O (δ = 0.01)." *Korean Journal of Materials Research* 34, 464-474 (2024).
- [6] Azuma Nobuhiko, **Sawada Hiroki**, Itoh Houji, Sakagami Ryosuke, Matoba Masanori, Usui Hidenori, and Kamihara Yoichi. "In-gap-states of a mixed anion layered compound, polycrystalline LaCu_{1-δ}S_{0.5}Se_{0.5}O (δ~0.01) as a degenerate semiconductor." *Materials Science and Technology Japan* 58, 64-68 (2021).

Personal Projects

2025.3 – present	LLM-based Mobile Game App (in development) Personal Project Swift, Python, OpenAI API • Designing and developing an iOS game app where users ask questions to guess an answer the AI has thought of. • Integrated OpenAI GPT API and AWS Lambda for real-time inference and data handling. • Applied prompt engineering techniques to constrain and guide model responses across different genres (e.g., animals, brands, countries). • Leveraged Retrieval-Augmented Generation (RAG) to reduce API call cost while maintaining consistency and relevance. • Built entirely using Swift and Xcode as a native iOS app. Demo available upon request (Planned to launch mid-July 2025).
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AWARDS AND HONOURS

2020.9 – 2026.6	Fully Funded Ph.D. Okinawa Institute of Science and Technology Graduate University, Okinawa, Japan ▫ Selected for a fully funded Ph.D. program.
2021.4 - 2022.3	JEES Softbank AI Researcher fellowship Softbank, Japan ▫ Scholarship for 1,000,000 yen without usage limitations. ▫ Granted to 100 Ph.D. students in the field of AI.
2025.1 - 2025. 7	Bourses France Excellence 2025 French Government, France ▫ Scholarship from French government to Japanese PhD students. ▫ Covers full tuition and monthly stipend of €1709 for 6 months.
2025.9	TOEIC Listening & Reading test: score 975 / 990

Language

English	Near Native-level fluency (<i>Lived 12 years abroad in an international environment; PhD program in English</i>)
Japanese	Native
French	Conversational proficiency (CEFR A2 level)

Activities

2022.2 – 2023.2	Diversity Officer, OIST Student Council ▫ Promoted interaction among students from diverse cultural backgrounds within OIST. ▫ Organized a campus symposium “What is discrimination?”.
2023.2 – 2024.2	Culture and External Relations Representative, OIST Student Council ▫ Strengthened relationships between OIST and the local community. ▫ Co-hosted two sake introduction events (≈50 participants each) in collaboration with Miss Sake, an organization promoting Japanese sake worldwide.

- Organized a joint cultural event with Okinawa Prefectural University of Arts.

2025.8

Reviewer, IEEE ICDL 2025

- Reviewed peer-reviewed contributed papers in the field of cognitive robotics and learning for the IEEE International Conference on Development and Learning (ICDL) 2025.
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