

Genji Kawakita

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EXPERIENCE

• Imperial College London — Be.Neural Lab

October 2023 – Present

PhD Student (Supervisor: Dr. Juan A. Gallego)

London, UK

- Designed and ran closed-loop, head-fixed mouse BCI experiments with Neuropixels probes.
- Built a 7-camera motion-capture + audio-feedback rig with PyControl hardware and custom Python pipelines; enabled real-time behavioral readout synchronized with neural data.
- Analyzed large-scale mouse neural datasets shared by Dr. Adam Hantman (UNC).
- Simulated neural adaptation to tendon transfer using a musculoskeletal model (MyoSuite) and reinforcement learning.

• Imperial College London — Be.Neural Lab

October 2022 – September 2023

MRes Student (Supervisor: Dr. Juan A. Gallego)

London, UK

- Built a 3D markerless motion-capture pipeline using SLEAP and Anipose.
- Analyzed inter-areal communication between motor cortex and dorsal striatum in mouse neural data.

• The University of Tokyo — Oizumi Lab

April 2021 – September 2022

Project Researcher (Supervisor: Prof. Masafumi Oizumi)

Tokyo, Japan

- Funded by Japan's Moonshot R&D Program; conducted computational neuroscience research.
- Developed a stochastic optimal-control framework to quantify brain state transition costs (Schrödinger bridge / linear stochastic systems).
- Built an unsupervised optimal-transport approach (Gromov–Wasserstein) to evaluate correspondences between qualia structures across individuals.
- Co-authored four publications (including three first-author papers).

• The University of Tokyo — Oizumi Lab

April 2019 – August 2019

Research Assistant (Supervisor: Prof. Masafumi Oizumi)

Tokyo, Japan

- Helped establish the lab's initial infrastructure and experimental/computational workflows.
- Organized a seminar/reading group on network control theory for lab members.
- Conducted literature reviews on optimal control and stochastic processes for brain dynamics.

• Araya Inc.

October 2018 – March 2019

Research Intern

Tokyo, Japan

- Analyzed macaque ECoG during awake vs. anesthetized states to compare neural dynamics and complexity.
- Validated a MATLAB toolbox for estimating integrated information (IIT) from brain data and streamlined analysis workflows.

• Xiborg

October 2018 – March 2019

Research Intern (Supervisor: Dr. Ken Endo)

Tokyo, Japan

- Assisted fabrication and fitting workflows for prosthetics serving Paralympic athletes and children.
- Supported device checks and adjustments alongside engineers and prosthetists.

• Swarthmore College

May 2018 – August 2018

Research Assistant

Pennsylvania, USA

- Implemented leaky-integrate and fire models of decision making in MATLAB.
- Ran simulations to study how network structure and input integration shape choice dynamics.
- Work contributed to one peer-reviewed co-authored publication.

• Araya Inc.

April 2016 – August 2016

Research Intern

Tokyo, Japan

- Ran psychophysics experiments with human participants.
- Authored a multi-part blog series on deep learning for public outreach.

EDUCATION

- **Imperial College London** October 2023 - Present
PhD in Bioengineering
◦ Supervisor: Dr. Juan Gallego London, UK
- **Imperial College London** October 2022 - September 2023
MRes in Neurotechnology (Distinction)
◦ Supervisor: Dr. Juan Gallego London, UK
- **Swarthmore College** August 2016 - May 2021
BA in Mathematics (Computer Science and Cognitive Science minors)
◦ GPA: 3.7/4.0 Pennsylvania, USA

SUPERVISION & MENTORING

- **Ioana Mara Preda (MSc), Imperial College London (Be.Neural Lab)** 2023 – 2024
Mouse behavioural strategies in response to perturbations during locomotion
- **Jom Teyavongsak (MEng), Imperial College London (Be.Neural Lab)** 2024 – 2025
Towards a universal cognitive and motor brain-computer interface
- **Joan Andres Pulgarin Florez (MSc), Imperial College London (Be.Neural Lab)** 2024 – 2025
Comparative analysis of brain-computer interface performance between motor and posterior parietal cortices in humans

PUBLICATIONS

C=CONFERENCE, J=JOURNAL, P=PATENT, S=PREPRINT/SUBMISSION, T=THESIS

Metrics: 144 citations, h-index: 6 (Google Scholar, Oct 2025)

- [J.1] **Genji Kawakita**, Ariel Zeleznikow-Johnston, Ken Takeda, Naotsugu Tsuchiya, Masafumi Oizumi (2025). **Is my “red” your “red”? Evaluating structural correspondences between color similarity judgments using unsupervised alignment.** *iScience*, 28, 112029.
- [J.2] **Genji Kawakita**, Ariel Zeleznikow-Johnston, Naotsugu Tsuchiya, Masafumi Oizumi (2024). **Gromov–Wasserstein unsupervised alignment reveals structural correspondences between the color similarity structures of humans and large language models.** *Scientific Reports*, 14:15917.
- [J.3] Shunsuke Kamiya, **Genji Kawakita**, Shuntaro Sasai, Jun Kitazono, Masafumi Oizumi (2023). **Optimal Control Costs of Brain State Transitions in Linear Stochastic Systems.** *The Journal of Neuroscience*, 43(2):270–281.
- [J.4] **Genji Kawakita**, Shunsuke Kamiya, Shuntaro Sasai, Jun Kitazono, Masafumi Oizumi (2022). **Quantifying brain state transition cost via Schrödinger Bridge.** *Network Neuroscience*, 6(1):118–134.
- [J.5] Victor J. Barranca, Han Huang, **Genji Kawakita** (2019). **Network structure and input integration in competing firing rate models for decision-making.** *Journal of Computational Neuroscience*, 46(2):145–168.
- [J.6] Ryota Kanai, Edwin S. Dalmaijer, Maxine T. Sherman, **Genji Kawakita**, Chris L. E. Paffen (2017). **Larger Stimuli Require Longer Processing Time for Perception.** *Perception*, 46(5):605–623.
- [S.1] Hiro Taiyo Hamada, Ippei Fujisawa, **Genji Kawakita**, Yuki Yamada (2025). **Measuring How LLMs Internalize Human Psychological Concepts: A preliminary analysis.** *arXiv:2506.23055 [cs.LG]*.

CONFERENCE PRESENTATIONS

C=CONTRIBUTED TALK, P=POSTER

Contributed Talks & Posters (peer-reviewed; selected)

- [C.1] **Genji Kawakita**⁺, Ariel Zeleznikow-Johnston, Naotsugu Tsuchiya, Masafumi Oizumi (2023). **Is my “red” your “red”? Unsupervised alignment of qualia structures via optimal transport.** Mind, Brain, Body Symposium 2023 (*Oral*), Berlin, Germany.
- [C.2] **Genji Kawakita**, Shunsuke Kamiya, Shuntaro Sasai, Jun Kitazono, Masafumi Oizumi (2020). **Asymmetry of brain state transition cost.** Japanese Neural Network Society (JNNS) (*Oral*), Online.
- [P.1] **Genji Kawakita**, Juan Alvaro Gallego (2025). **Modeling neural adaptation to tendon transfer.** UK Neural Computation 2025 (*Poster*), London, UK.
- [P.2] **Genji Kawakita**, Ariel Zeleznikow-Johnston, Ken Takeda, Naotsugu Tsuchiya, Masafumi Oizumi (2024). **Is my “red” your “red”? Unsupervised alignment of qualia structures via optimal transport.** ICLR 2024 Workshop on Representational Alignment (*Poster*), Vienna, Austria.
- [P.3] **Genji Kawakita**, Ariel Zeleznikow-Johnston, Ken Takeda, Naotsugu Tsuchiya, Masafumi Oizumi (2023). **Is my “red” your “red”? Unsupervised alignment of qualia structures via optimal transport.** Association for the Scientific Study of Consciousness (*Poster*), New York, USA.

- [P.4] **Genji Kawakita, Masafumi Oizumi (2022). Neural representation and dynamics of expert and imitating agents performing motor tasks.** The Japanese Society for Motor Control (*Poster*), Tokyo, Japan.
- [P.5] **Genji Kawakita, Masafumi Oizumi (2022). Neural representation and dynamics of expert and imitating agents performing motor tasks.** The Japan Neuroscience Society (*Poster*), Okinawa, Japan.
- [P.6] **Genji Kawakita, Shunsuke Kamiya, Shuntaro Sasai, Jun Kitazono, Masafumi Oizumi (2021). Asymmetry of brain state transition cost.** Computational and Systems Neuroscience (COSYNE) (*Poster*), Online.

HONORS AND AWARDS

- **JASSO Overseas Study Support Program (Graduate Degree Program)**
Japan Student Services Organization (JASSO)

 - Competitive scholarship for Japanese students pursuing *graduate degrees abroad*; monthly stipend and a one-time travel grant.

2024 – 2026


- **BRAVE GLOBAL — Startup Creation Program (Grant: JPY 3,000,000 / £15,000)**
Beyond Next Ventures

 - Deep-tech commercialization program for overseas Japan-affiliated researchers; provides activity funding (up to JPY 3,000,000), mentoring, and demo/pitch sessions.
 - Awarded **JPY 3,000,000 (£15,000)** grant to support venture creation activities (program period Oct 2024–Mar 2025).

2024 – 2025


- **Ezoe Memorial Recruit Scholarship (Academic Division)**
Ezoe Memorial Recruit Foundation

 - Highly selective merit scholarship; **acceptance rate typically below 5%**.
 - **Support up to £69,000/year** for UK study.

2016 – 2025


- **Grew Bancroft Scholarship**
Grew Bancroft Foundation

 - Prestigious Japan–U.S. exchange scholarship with a history of nearly 100 years (founded 1930); supports selected Japanese students to study at leading U.S. liberal arts colleges.

2016


- **Japan Brain Bee — National Gold Medal**
Japan Brain Bee (International Brain Bee – Japan)

 - National champion, selected to represent Japan at the International Brain Bee World Championship.

2015

