

# Genji Kawakita

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[LinkedIn](#) | [GitHub](#) | [Google Scholar](#) | [Twitter](#)

## 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

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

## SUPERVISION & MENTORING

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

## 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. Dalmajer, 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<sup>†</sup>, 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

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- **JASSO Overseas Study Support Program (Graduate Degree Program)** 2024 – 2026  
*Japan Student Services Organization (JASSO)* [🌐]  
◦ Competitive scholarship for Japanese students pursuing *graduate degrees abroad*; monthly stipend and a one-time travel grant.
- **BRAVE GLOBAL — Startup Creation Program (Grant: JPY 3,000,000 / £15,000)** 2024 – 2025  
*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).
- **Ezoe Memorial Recruit Scholarship (Academic Division)** 2016 – 2025  
*Ezoe Memorial Recruit Foundation* [🌐]  
◦ Highly selective merit scholarship; **acceptance rate typically below 5%**.  
◦ **Support up to £69,000/year** for UK study.
- **Grew Bancroft Scholarship** 2016  
*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.
- **Japan Brain Bee — National Gold Medal** 2015  
*Japan Brain Bee (International Brain Bee – Japan)* [🌐]  
◦ National champion, selected to represent Japan at the International Brain Bee World Championship.