

Genki Miyauchi

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Education and Research

May 2023 - Research Associate

Present *The University of Sheffield, United Kingdom*

Project: OpenSwarm (Orchestration and Programming ENergy-aware and collaborative Swarms With AI-powered Reliable Methods). Funded by the Horizon Europe project.
Postdoc Advisor: Dr. Roderich Groß

Oct. 2019 - Ph.D. Automatic Control and Systems Engineering

Mar. 2024 *The University of Sheffield, United Kingdom*

PhD Thesis:

“Multi-Operator Control of Connectivity-Preserving Robot Swarms”

Supervisor: Prof. Roderich Groß, Prof. Sanja Dogramadzi

Funding: Departmental PhD Scholarship, The University of Sheffield

Sep. 2015 - MSci Robotics and Intelligent Systems

July 2019 *King's College London, United Kingdom*

First Class honours.

Masters Thesis:

“Empirical Evaluation of the Effects of Tasks with Varying Durations on Multi-Robot Teams”

Undergraduate Thesis:

“Interaction-Based System for a Human and Multi-Robot Team in a Search Task”

Supervisor: Prof. Elizabeth Sklar

Experience

June 2022 SwarmHack 2022

The University of Sheffield

Helped organise a hackathon where students learnt about operating robot swarms. Jointly organised by universities from Sheffield, York, and Manchester. Funded by the UK-RAS network.

Mar. 2022 Human-Swarm Partnership: current state and future challenges

UKRI TAS Hub

My research was presented at the UKRI TAS Hub workshop on human-swarm interaction.

Sep. 2020 IEEE RAS Summer School on Multi-Robot Systems

IEEE RAS Technical Committee on Multi-Robot Systems

Participated in a summer school on multi-robot systems research. Participants formed teams to complete challenges in controlling a group of aerial vehicles over a set of waypoints.

June 2018 – Undergraduate Research Assistant

July 2018 *King's College London*

Worked on extending my third year project on interaction-based system for Human/Multi-Robot Teaming.

June 2017 – Undergraduate Research Fellow

July 2017 *King's College London*

Project title: “*Kinba: Robot Artist*”

Developed a painting task to draw and paint on a slanted easel using a mobile robot equipped with a robotic arm and an RGB-D camera. Face detection and trajectory planning techniques were used to produce portraits of visitors during the university open days.

Video: <https://vimeo.com/243278999>. (Received the Best Video Submission award)

Supervisor: Prof. Elizabeth Sklar, Mr. Chipp Jansen, Dr. Hongbin Liu.

Sep. 2016 – Committee member

Aug. 2018 *KCL Robotics Society*

Organised events and weekly workshops for 40 high school and undergraduate students each semester to develop Arduino and Raspberry Pi based robots, such as line follower robots and remotely operated tracked robots.

Publications

- **G. Miyauchi**, Y. K. Lopes, R. Groß, “Sharing the Control of Robot Swarms Among Multiple Human Operators: A User Study,” in *2023 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, IEEE, 2023.
- F. Pratissoli, A. Reina, Y. K. Lopes, C. Pinciroli, **G. Miyauchi**, L. Sabattini, and R. Groß, “Coherent Movement of Error-Prone Individuals Through Mechanical Coupling,” *Nature Communications*, vol. 14, no. 1, p. 4063, 2023.
- **G. Miyauchi**, Y. K. Lopes, R. Groß, “Multi-Operator Control of Connectivity-Preserving Robot Swarms Using Supervisory Control Theory,” in *2022 IEEE International Conference on Robotics and Automation (ICRA)*, IEEE, 2022, pp. 6889–6895.
- **G. Miyauchi** and E. Sklar, “A Study Assessing the Impact of Task Duration on Performance Metrics for Multi-Robot Teams,” in *Towards Autonomous Robotic Systems: 21st Annual Conference (TAROS)*, Springer-Verlag, 2020, pp. 138-143.
- Z. Huang, **G. Miyauchi**, A. S. Gomez, R. Bird, A.S. Kalsi, C. Jansen, Z. Liu, S. Parsons and E. Sklar, “An Experiment on Human-Robot Interaction in a Simulated Agricultural Task,” in *Towards Autonomous Robotic Systems: 21st Annual Conference (TAROS)*, Springer-Verlag, 2020, pp. 221–233.
- Z. Huang, **G. Miyauchi**, A. S. Gomez, R. Bird, A.S. Kalsi, C. Jansen, Z. Liu, S. Parsons and E. Sklar, “Toward Robot Co-Labourers for Intelligent Farming,” in *Companion of the 2020 ACM/IEEE International Conference on Human-Robot Interaction (HRI '20 Companion)*, ACM, 2020, pp. 263-265.

Academic Service

I have been a reviewer for the following journals and conferences.

- 2024** IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)
- 2024** The International Journal of Robotics Research (IJRR)
- 2022 – 2024** International Conference on Autonomous Agents and Multiagent Systems (AAMAS)
- 2022 – 2024** International Joint Conference on Artificial Intelligence (IJCAI-ECAI)
- 2023** Towards Autonomous Robotic Systems (TAROS)
- 2022** Conference on Neural Information Processing Systems (NeurIPS)
- 2022 – 2024** International Symposium on Distributed Autonomous Robotic Systems (DARS)
- 2022 – 2024** International Conference on Swarm Intelligence (ANTS)
- 2022** Autonomous Robots (AURO)
- 2022** IEEE International Conference on Robotics and Automation (ICRA)
- 2021 – 2023** Swarm Intelligence
- 2021** IEEE International Symposium on Multi-Robot and Multi-Agent systems (MRS)
- 2021** European Conference on Mobile Robots (ECMR)
- 2020 – 2024** Robotics: Science and Systems (RSS)

Teaching

I have been a teaching assistant for the following modules.

2023/24	ACS6501, Foundations of Robotics, <i>The University of Sheffield</i>
2022/23	ACS6501, Foundations of Robotics, <i>The University of Sheffield</i>
2021/22	ACS6501, Foundations of Robotics, <i>The University of Sheffield</i>
2021/22	ACS337, Robotic Systems, <i>The University of Sheffield</i>
2020/21	ACS6501, Foundations of Robotics, <i>The University of Sheffield</i>
2020/21	ACS6121, Mobile Robotics and Autonomous Systems, <i>The University of Sheffield</i>
2020/21	ACS337, Robotic Systems, <i>The University of Sheffield</i>
2019/20	ACS6501, Foundations of Robotics, <i>The University of Sheffield</i>
2019/20	ACS6121, Robotics and Autonomous Systems, <i>The University of Sheffield</i>
2019/20	ACS337, Robotic Systems, <i>The University of Sheffield</i>
2018/19	4CCS1CS1, Computer Systems, <i>King's College London</i>
2018/19	5CCS2RGP, Robotics Group Project, <i>King's College London</i>
2017/18	4CCS1PPA, Programming Practice, <i>King's College London</i>
2017/18	5CCS2PLD, Programming Language Design and Paradigms, <i>King's College London</i>

Awards

2021	Winner of MRC 2021 , <i>The University of Sheffield, AMRC</i> Awarded to the group that outperformed the other teams to win the competition at the UK-RAS Manufacturing Robotics Challenge 2021.
2021	Poster Award , <i>The University of Sheffield, Department of ACSE</i> Awarded to the top five students who have presented the best posters at the ACSE Postgraduate Research Symposium.
2020	Best Paper Award , <i>UKRAS 20</i> Best paper award at the 3rd UK-RAS Conference for the paper titled "A Study Assessing the Impact of Task Duration on Performance Metrics for Multi-robot Teams."
2019	Robotics Prize (Fourth Year) , <i>King's College London</i> Awarded to the student who has obtained the best results during the fourth year of study on an Integrated Masters Robotics Programme.
2018	Peplow Prize , <i>King's College London</i> Awarded to the student who has distinguished themselves in the third year project on an Undergraduate Robotics Programme.
2017	King's Experience Research Award , <i>King's College London</i> Successfully completed the King's Undergraduate Research Fellowship (KURF). Also named as the prize-winner for the Best Video submission .
2017	Robotics Prize (Second Year) , <i>King's College London</i> Awarded to the student who has obtained the best results during the second year of study on an Undergraduate Robotics Programme.
2016	Walter Smith Prize , <i>King's College London</i> Awarded to the student who has most distinguished him or herself in the first year of an Undergraduate Robotics Programme.
2015	Sponsor Prize , <i>Revolut</i> Developed an app to show how much a user would save money using Revolut, a rising fintech company. Won the sponsor prize at HackKing's (Student Hackathon).

Membership

- 2020 – IEEE student member
- 2017 – The Robotics Society of Japan (RSJ), student member

Skills

- **Programming:** C, C++, Python, Java, MATLAB, R, JavaScript, Git, Docker.
- **Robotic Systems:** Robot Operating System (ROS), TurtleBot, e-puck, Kilobot.
- **Languages:** English (Professional Proficiency), Japanese (Native), Korean (Elementary Proficiency).
- **Other interest:** Competitive Swimming (University Swimming Team), Shogi