YUKA MACHINO

Cambridge MA, 02139 | ymachio@stanford.edu |(857)-928-8348

EDUCATION

Stanford University, Stanford, CA — Beginning Sep. 2025 -
PhD in Computer Science, Research Topic: Communication, Culture, Theory of Mind, Social Cognition.

Massachusetts Institute of Technology, Cambridge, MA — June 2024 – May 2025 (Projected)
Master of Engineering in AI and Decision Making. Advised by Josh Tenenbaum and Robert Hawkins. GPA: 5.0/5.0

Massachusetts Institute of Technology, Cambridge, MA — Sep. 2021 – May 2024
Bachelor of Science. Double major in Mathematics, and Artificial Intelligence and Decision Making. GPA: 5.0/5.0

ACADEMIC ACHIEVEMENTS

International Mathematical Olympiad (IMO): two consecutive Gold Medals (represented UK) 2020/2021
European Girls' Mathematical Olympiad: three consecutive Gold Medals (represented UK) 2019/2020/2021
European Girls' Olympiad in Informatics: Silver Medal (represented Japan) 2021

PUBLICATIONS

- Machino, Y., Hofer, M., Siegel, M., Tenenbaum, J.B., & Hawkins, R.D. (2025). Minding the Politeness Gap in Cross-cultural Communication. Proceedings of the Annual Meeting of the Cognitive Science Society, 47. Machino, Y., Shprints, R., Siegel, M., Wong, L., & Tenenbaum, J. (2024). Listener Knowledge Structures Commonsense Explanation. *Proceedings of the Annual Meeting of the Cognitive Science Society, 46*.
- Censor-Hillel, K.,**Machino, Y.**, and Soto, P. (2024).* Near-Optimal Fault Tolerance for Efficient Batch Matrix Multiplication via an Additive Combinatorics Lens. **Best Student Paper Award** In Structural Information and Communication Complexity: 31st International Colloquium.
- Ghalme, G., Huang, X., **Machino, Y.**, & Rathi, N. (2024).* A Discrete and Bounded Locally Envy-Free Cake Cutting Protocol on Trees. In J. Garg, M. Klimm, & Y. Kong (Eds.), *Web and Internet Economics - 19th International Confere*nce, WINE 2023, Proceedings (pp. 310-328).

*The last two papers are in the field of Theoretical Computer Science, hence authors are all first authors, and are listed in alphabetical order.

RELEVANT RESEARCH EXPERIENCE

Student Researcher at **Computational Cognitive Science Laboratory (CoCoSci) at MIT** May 2023 – Present
- Collaborating with Prof. Robert Hawkins in the Linguistics Department at Stanford, as well as lab members at CoCoSci to model cross-cultural differences in communication.
- Developed a computational model of natural language explanations, which incorporate listener knowledge.
- Designed experimental stimuli to validate the model, and presented findings at the CogSci Conference 2024.

Research Intern at **University of Cambridge, CS Department** (supported by MIT- UK). June 2024 – Present
- Collected data from participants at the International Math Olympiad, and trained a neuro-symbolic model using the data to generate interesting math problems. Currently preparing a paper for publication.

Research Intern at **Language and Intelligence Lab at MIT** Feb 2024 - May 2024
- Created a neurosymbolic model to learn human preferences by leveraging natural language to augment data.

Research Intern at **University of São Paulo, CS Department** (supported by MIT-Brazil) July 2023 – August 2023
- Created example uses of a newly developed probablistic programming language. Advised by Prof. Denis Mauá

Research Intern at Early **Childhood Cognition Laboratory at MIT** January - May 2023
- Used Pandas and Matplotlib to analyze eye movement data from baby videos.

Research Intern at **Computer Science Department, Technion University** (supported by MIT-Israel) May - July 2022
- Conducted research in distributed algorithms and coding theory with professor Keren Censor-Hillel.

HONORS

Recruit Scholarship September 2021 - Present

- Covers full tuition and living stipend.

SKILLS

- Programming languages: Python, C++ and WebPPL.
- Languages: Fluent in Japanese (mother tongue) and English. Limited proficiency in Chinese and Spanish.

WORK EXPERIENCE

Intern at **Open Learning Exchange Nepal**

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EXTRACURRICULAR EXPERIENCE

Member of the Problem Selection Committee for **International Math Olympiad 2025** April – July 2025

- Curated a shortlist of math olympiad problems from all submitted problem statements.

Team Leader of Ghana at the International Math Olympiad 2023 *July 2023*

Volunteer at **MISE Foundation Ghana** Jan 2022 – present

- Organizing online teaching, providing resources, recruiting/training teachers, and helping obtain funding.

Participant in **MIT-Africa** Jan 2022, 2023, 2024

- Helped organize, teach and promote math olympiads in Ghana (‘22), South Africa (‘23), and Rwanda (‘24).

Teaching Assistant at **Math Olympiad Program**(residential program for top scorers of US Math Olympiad) June 2023

- Devised and taught a class. Proctored and graded team selection tests.

Ghana Team Leader at **International Mathematical Olympiad 2023,** Japan
July 2023

- Trained the Ghana Olympiad team, graded their papers, and negotiated marks with exam coordinators.

Online Coordinator at **Pan African Math Olympiad**. May 2023

Data Scientist Intern at **MC Digital** August 2022

- Used mathematical modeling to optimize the production of electricity in a power station, and presented findings to colleagues.

Guest Speaker at **Sapporo Nishi-Highschool,** Japan June 2021

- Devised and taught a class to 50 students new to Olympiad mathematics, coordinating with their teacher.

Panelist at **KIOI STEAM LAB** June 2021

- Discussed my experience as a participant in math olympiads to educate the public in the lead up to the International Math Olympiad (IMO) 2023 hosted in Japan.