

Tadayoshi Kamegai

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EDUCATION

University of Oxford

Oct 2022 – Jun 2026

Master in Mathematics and Computer Science

- Postmaster of Merton College, University of Oxford
- Awarded **First Class Honours** in Part A/B Examinations, Distinction in Preliminary Examinations
- Relevant courses: Principles of Programming Languages, Lambda Calculus, Functional Programming, Topology, Commutative Algebra, Computer Aided Formal Verification, Logic and Proof, Representation Theory

EMPLOYMENT / PROJECT COLLABORATION

Mobility Reading Group, University of Oxford | Research Assistant

Jun 2024 – Present

- Advisor : Prof. Nobuko Yoshida
- Topics : Multiparty Session Types, Coq Mechanization
- Formally verified subject reduction in Synchronous MPST with a variety of coinductive merging in Rocq
- Received additional funding by grant from the Merton Summer Projects Scheme

Oxford Artificial Intelligence Society | Researcher, *Fairness Diffusion Models Team*

Dec 2023 – Sep 2024

- Generated models and designed new methods based on ITI-GEN to extrapolate age while disentangling race within stable diffusion
- Trained and ran models remotely on AWS

Nikkei | Intern, *Data Engineer*

Sep 2023

- Analyzed internal data from Nikkei Atlas to identify demographic and usage trends with SQL, Python and BigQuery
- Implemented a refinement of Nikkei internal search engine accuracy using Google's Natural Language Processing API framework
- Co-developed supplementary chat-bot using GPT and FastAPI as a client-side extension

teamLab | Intern, *Machine Learning Team*

Jul 2023 – Aug 2023

- Developed and presented an optimization algorithm on placing moving ropes without collision in 3D space
- Improved heuristic score by 28.5% compared to client's in-house model, and automated the full optimization process to be used in future projects and exhibits
- Improved precision and running time with annealing and concurrency in C++

RESEARCH

Publications

- **Formalising Subject Reduction and Progress for Multiparty Session Processes**
(To appear) Interactive Theorem Proving 2025
B. Ekici, T. Kamegai, N. Yoshida.

Invited Talks / Lectures

- **Intorduction to the Rocq Programming Language.** Mar 8, 2025
As part of a lecture series on programming languages by Oxford CompSoc
- **Subject Reduction for Synchronous MPST in Coq.** Nov 20, 2024
Final lecture of Master's Course in *Distributed Processes, Types and Programming*, University of Oxford

Contributions

- Notes on coinduction, A Duality in Proof Structures: Intuition for Bridging Induction and Coinduction
- Notes on Programming Language Concepts
- On-Line Encyclopedia of Integer Sequences (OEIS) entries A369580, A372141, A372142, regarding prime numbers and probability distributions of games

Grants

- Yanai-Tadashi Foundation Scholarship : Full funding of tuition, room and board, insurance plus an additional living stipend for the duration of the undergraduate degree (Approx. £270,000; 2022 ~ 2026)
- Exhibition scholarship for outstanding academic performance by Merton College
- Postmaster scholarship in recognition of sustained academic excellence by Merton College

EVENT ORGANIZATION

Oxford University CompSoc | Head of Talks

May 2023 – Mar 2025

- Responsible for inviting and coordinating events with internal and external speakers in computer science
- Past speakers include Kevin Buzzard, David J. Malan, Peter Millican, and Brent Mittelstadt