Tadayoshi Kamegai

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EDUCATION

University of Oxford   Oct 2022 – Jun 2026 (expected)
MMath in Mathematics & Computer Science (Integrated Master's)   *Oxford, UK*
- Merton College **Postmaster**. First Class Honours (Part A/B); Distinction in Preliminary Examinations.
- Selected coursework: Principles of Programming Languages; Lambda Calculus; Computer-Aided Formal Verification; Logic & Proof; Functional Programming; Topology; Commutative Algebra; Representation Theory.

PUBLICATIONS & PREPRINTS

B. Ekici, **T. Kamegai**, **N. Yoshida**. *Formalising Subject Reduction and Progress for Multiparty Session Processes.* ITP 202

RESEARCH EXPERIENCE

Mobility Reading Group, University of Oxford | Research Assistant (Advisor: Prof. Nobuko Yoshida) Jun 2024 – Pres
- Mechanised **subject reduction** for synchronous MPST with coinductive merging in Rocq/Coq; co-author on ITP'25 submission.
- Maintained a reproducible build and curated example derivations; received **Merton Summer Projects Scheme** supplemental funding.

ELTE (with Ambrus Kaposi) | Research Intern (QIITs)   2025 – Present
- Produced technical notes on **(Q)IITs**, focusing on eliminators and interactions with path constructors; mapped proof obligations and gap cases.

ITU Copenhagen (with Daniel Gratzer) | Reading Project (Modal Logic)   2025
- Compared **Fitch-style** and **dual-context** S4 presentations; prepared worked typing derivations and a translation sketch for a core fragment.

TALKS & LECTURES

- **Introduction to the Rocq Programming Language**. Oxford CompSoc lecture series.   8 Mar 2025
- **Subject Reduction for Synchronous MPST in Coq**. Final lecture, *Distributed Processes, Types and Programming*, University of Oxford.   20 Nov 2024

SELECTED NOTES & EXPOSITORY

- Notes on coinduction — *A Duality in Proof Structures: Intuition for Bridging Induction and Coinduction.* PDF
- Notes on *Programming Language Concepts.* PDF

SCHOLARSHIPS & AWARDS

- **Yanai–Tadashi Foundation Scholarship**: full tuition, room/board, insurance, and stipend (approx. £270,000), 2022–2026.
- **Merton College Exhibition Scholarship** (academic performance).
- **Merton College Postmaster Scholarship** (sustained academic excellence).

SERVICE & LEADERSHIP

Oxford University Computer Society (CompSoc) | Head of Talks   May 2023 – Mar 2025
- Invited and coordinated events with internal and external speakers in computer science.
- Notable speakers: Kevin Buzzard; David J. Malan; Peter Millican; Brent Mittelstadt.

Other Experience (Industry & Projects)

Oxford Artificial Intelligence Society | Researcher, *Fairness Diffusion Models Team*   Dec 2023 – Sep 2024
- Designed ITI-GEN–based method to **extrapolate age while disentangling race** within Stable Diffusion; trained and ran models on **AWS**.

Nikkei | Intern, *Data Engineer*   Sep 2023
- Analysed internal data (Nikkei Atlas) to identify demographic/usage trends (**SQL**, **Python**, **BigQuery**).
- Refined internal search-engine accuracy using Google Natural Language API; co-developed a **FastAPI** GPT-based chatbot extension.

teamLab | Intern, *Machine Learning*   Jul 2023 – Aug 2023
- Developed an optimisation algorithm for collision-free placement of moving ropes in 3D; improved heuristic score by **28.5%** and automated the pipeline.
- Improved precision and runtime using **annealing** and **concurrency** in **C++**.

Other Scholarly Contributions

- OEIS entries: A369580; A372141; A372142 (prime numbers; probability distributions of games).