

# Fangyi Zhou

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| <https://github.com/fangyi-zhou>

| London, UK

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## EDUCATION

**Doctor of Philosophy (PhD) in Computing** Imperial College London Sep 2019 — Aug 2023

Thesis Title: Refining Multiparty Session Types (Awarded Mar 2024)

Topics: Multiparty Session Types, Refinement Types, Distributed Systems, Programming Languages

**Master of Engineering (MEng) in Computing** Imperial College London Oct 2015 — Jun 2019

1st Class Honours, Overall 86.89%, **Dean's List** for Years 1, 2, 3 and 4

Awards: Adrian Israel Memorial Prize, Corporate Partnership Programme Prize, G-Research Ltd Prize, Corporate Partnership Programme Award, Governors' Prize (for **best overall performance**)

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## EXPERIENCE

**Software Development Engineer/Applied Scientist** Amazon Prime Video, UK May 2023 — Nov 2024

Studios AI Lab (Nov 2023 — Nov 2024): I worked as a Software Development Engineer on building an application for extracting and processing information from documents using **Large Language Models (LLM)**.

- Developed medium-sized features (e.g. supporting ingestion and translation of non-English documents), **independently and in collaboration** with other team members in an **agile** development environment. Partnered with product and UX teams to gather and implement feedbacks, and ensure timely delivery.
- Performed **Full-stack** engineering in a **micro-service** environment on **AWS**, utilising **TypeScript** and **React.js** for frontend development, **TypeScript** for backend services, and **Python** for machine learning implementations.
- Bridged science and engineering teams, by **providing crucial engineering support for scientists**, e.g. productionising prototypes, and establishing cross-codebase interfaces.
- Delivered infrastructure improvement for the team, improving resilience and reliability, e.g. migrating a key **CI/CD pipeline** for the ML codebase to a modern system with more flexibility and less maintenance effort.
- Achieved **significant performance improvements** by optimising system bottlenecks, e.g. patching 3rd-party libraries (reduced semantic search time from ~5min to ~2s) and optimising LLM usages (reduced processing time from ~30min to ~5min), improving the overall efficiency of the system.
- Contributed to team growth by **mentoring** junior team members, and delivering technical presentations.

Automated Reasoning (May 2023 — Nov 2023): I worked as an applied scientist on building a **static analyser** for JavaScript/TypeScript, where I modelled language features of JavaScript/TypeScript in the analyser.

Skills: Python, TypeScript, React.js, Java, Scala, Docker, AWS, System design, DevOps, Rapid prototyping

**Research Assistant** Imperial College London/University of Oxford, UK Sep 2019 — Mar 2023

I worked in the Mobility Research Group under the supervision of Professor Nobuko Yoshida, published high-quality research papers in programming language conferences, including a **distinguished paper** at ECOOP 2023. (Sep 2019 — Sep 2022 at Imperial, Oct 2022 — Mar 2023 at Oxford due to supervisor moved)

Skills: OCaml, F\*, Docker,  $\LaTeX$ , Source code generation, Program verification, Research paper writing

**Graduate Teaching Assistant** Imperial College London, UK Oct 2019 — Jun 2022

**Software Engineering Intern (Industrial Placement)** Facebook, UK Apr 2018 — Sep 2018

I worked in Hack Language team on implementing new experimental language features, and in Sapienz team on improving categorisation of crashes of Android applications.

Skills: OCaml, Python

**Undergraduate Teaching Assistant** Imperial College London, UK Oct 2017 — Mar 2018

**Research Intern** Arm, UK Jul 2017 — Sep 2017

I worked in Security Research Group on specification and verification of data structures used in hypervisor software for embedded systems.

Skills: C, Bounded Model Checking, Program Specification, Program Verification

## SKILL

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**Programming** TypeScript/JavaScript, Python, OCaml, Scala, Java

**Tools** Git, AWS, Docker, Shell Scripting, SQL,  $\LaTeX$ , SMT Solvers

## COURSE CERTIFICATE

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- Machine Learning Specialization by Stanford University & DeepLearning.AI on Coursera. Oct 2023
- Deep Learning Specialization by DeepLearning.AI on Coursera. Nov 2023

## PUBLICATION

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- [1] F. Zhou. “Refining multiparty session types”. PhD thesis. Imperial College London, 2024. DOI: [10.25560/110416](https://doi.org/10.25560/110416).
- [2] A. D. Barwell, P. Hou, N. Yoshida, and F. Zhou. “Designing Asynchronous Multiparty Protocols with Crash-Stop Failures”. In: *37th European Conference on Object-Oriented Programming (ECOOP 2023)*. Vol. 263. LIPIcs. Received **Distinguished Paper Award**. 2023, 1:1–1:30. DOI: [10.4230/LIPIcs.ECOOP.2023.1](https://doi.org/10.4230/LIPIcs.ECOOP.2023.1).
- [3] A. D. Barwell, A. Scalas, N. Yoshida, and F. Zhou. “Generalised Multiparty Session Types with Crash-Stop Failures”. In: *33rd International Conference on Concurrency Theory (CONCUR 2022)*. Vol. 243. LIPIcs. 2022, 35:1–35:25. DOI: [10.4230/LIPIcs.CONCUR.2022.35](https://doi.org/10.4230/LIPIcs.CONCUR.2022.35).
- [4] A. Miu, F. Ferreira, N. Yoshida, and F. Zhou. “Communication-Safe Web Programming in TypeScript with Routed Multiparty Session Types”. In: *Proceedings of the 30th ACM SIGPLAN International Conference on Compiler Construction*. CC 2021. ACM, 2021, pp. 94–106. DOI: [10.1145/3446804.3446854](https://doi.org/10.1145/3446804.3446854).
- [5] N. Yoshida, F. Zhou, and F. Ferreira. “Communicating Finite State Machines and an Extensible Toolchain for Multiparty Session Types”. In: *Fundamentals of Computation Theory*. Cham: Springer International Publishing, 2021, pp. 18–35. DOI: [10.1007/978-3-030-86593-1\\_2](https://doi.org/10.1007/978-3-030-86593-1_2).
- [6] A. Miu, F. Ferreira, N. Yoshida, and F. Zhou. “Generating Interactive WebSocket Applications in TypeScript”. In: *Proceedings of the 12th International Workshop on Programming Language Approaches to Concurrency- and Communication-Entric Software*. Vol. 314. EPTCS. 2020, pp. 12–22. DOI: [10.4204/EPTCS.314.2](https://doi.org/10.4204/EPTCS.314.2).
- [7] F. Zhou, F. Ferreira, R. Hu, R. Neykova, and N. Yoshida. “Statically Verified Refinements for Multiparty Protocols”. In: *Proc. ACM Program. Lang.* 4.OOPSLA (Nov. 2020). DOI: [10.1145/3428216](https://doi.org/10.1145/3428216).

## PROFESSIONAL ACTIVITY

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- Programme Committee: CC 2025, ICE 2023
- Artifact Evaluation Committee: COORDINATION 2024
- Reviewer: PLACES 2022