

Jason Zheng

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Education

Imperial College London

London, UK

CERTIFICATE FOR STUDENT LEADERS, IMPERIAL COLLEGE BUSINESS SCHOOL

Nov 2022 – April 2023

- Executive Education course in developing leadership, consulting, lobbying, and communication skills.

MENG ELECTRONIC AND INFORMATION ENGINEERING (COMPUTER ENGINEERING)

Sept 2018 – July 2022

- First-Class Honours, Lee Memorial Prize
- Relevant Modules: Functional Programming, Computer Architecture, Performance Engineering, Self-Organising Multi-Agent Systems, Embedded Systems, Human-Centered Robotics, Hardware and Software Verification

Programming Work Experience and Projects

RISC-V CPU Simulator

Personal project (in progress)

- Currently implementing a RISC-V RV32I CPU Simulator in **Golang**.
- Goal of the project is to pass all relevant tests in the official `riscv-tests` repository.

Multi-Agent Simulation: The Platform-Playing Platform

Self-Organising Multi-Agent Systems, project

- Led a group project of 47 people split into 7 teams to build a platform for simulating a system of players capable of self-organising with other players of different strategies to maximise collective utility and survival.
- Implemented features using **Golang** such as message passing and health tracking, and used **Docker** to ensure reproducible builds and testing across each person's different machines and operating systems.
- Led on system architecture and design, reviewed pull requests, chaired meetings, and managed deadlines and deliverables.
- Taught other group members how to use **Git** and write Go.

Interactive Visualisation of Sequential Logic in Issie

MEng Thesis Project

- Redesigned and reimplemented a waveform simulator using the Elmish Model-View-Update architecture for a digital electronics simulator.
- Improved functionality and user experience while maintaining backwards compatibility.
- Significantly reduced technical debt and improved documentation, increasing maintainability and extensibility for future developers.
- Gained experience in functional language **F#** alongside Fable, Fulma (F# wrapper for Bulma), HTML, CSS and React.
- Created contribution guidelines in the open-source repo to enforce proper use of version control and code review.

Arm – Part-Time Undergraduate

Dec 2020 – March 2022 (full-time April to Sept 2021), Cambridge, UK

- Extended Compiler Explorer (written in **JavaScript**) to compile OpenCL C and C++ for OpenCL to Arm assembly and SPIR-V assembly and used **Docker** to add infrastructure support for SPIR-V/LLVM Translator, resulting in improved productivity for the GPU Compiler team.
- Fixed bugs in open-source software, including **Clang** and the **SPIR-V/LLVM Translator**, to correctly produce debugging info when compiling OpenCL languages.
- Investigated an **OpenCL C** extension to allow dynamic memory allocation from kernel functions running on OpenCL devices.
- Implemented a basic version of `malloc` and `free` to run on single-threaded OpenCL devices.

Arm – GPU Software Engineering Intern

June 2020 – Sept 2020, Cambridge, UK

- Extended a **kernel driver** written in **C** to allow it to interoperate with QEMU, removing the need for a separate usermode driver.
- Used a memory-backend-file to share memory between the Host and Guest, taking into account their different memory mappings.
- Implemented new interrupt requests for reading and writing to GPU registers via shared memory.

Keyboard Music Synthesiser

Embedded Systems, project

- Implemented firmware for a multi-threaded keyboard synthesiser, with support for volume control, octave control, and multiple timbres.

C to MIPS Compiler and MIPS CPU Simulator

Computer Architecture & Language Processors, project

- Built a compiler in **C++** to generate **MIPS assembly** from C90 and a transpiler to translate a subset of C into equivalent **Python**.
- Implemented lexing and parsing functionality using **Flex** and **Yacc**.
- Developed a CPU simulator in **C++** to execute MIPS-1 big-endian binaries, and created a testbench to verify correctness of the simulator.
- Referenced the MIPS ISA specification to ensure parity between emulated instructions and the real hardware.

Other Experience

Imperial College Union – Deputy President (Education)

July 2022 – July 2023, London, UK

- Elected as Sabbatical Officer and Trustee of charity with 24000+ members, 50+ full-time staff, and annual turnover of £11m.
- Acted as lead student representative to Imperial College on education while managing network of 300+ student representatives.
- Leading role in developing a new organisational strategy, setting the priorities and direction for the Students' Union for the next five years.
- Responsible for governance, education representation, policy and strategy development, stakeholder management, quality assurance.
- Chair and member of various interview and recruitment panels, including for senior university management positions.

Imperial College London – Undergraduate Teaching Assistant

Sept 2020 – March 2022, London, UK

- Responsible for teaching students C++ programming concepts in a clear and concise manner.

Skills and Interests

Programming Go, F#, C/C++, Python, JavaScript, Verilog

Tools Git, Linux, Docker, SQL, CAD (Autodesk Inventor, Fusion 360)

Other Skills English (native), Mandarin Chinese (proficient), Full UK and NZ driving licences

Volunteering **EIE Student Representative (2020-2022), Treasurer ('21/22), Secretary ('20/21) of Imperial College Wind Band**

Music ABRSM Grade 8 Piano and Clarinet; previous member of Symphony Orchestra, Concert Band, Production Orchestras