

Jason Zheng

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Education

Imperial College London

MENG ELECTRONIC AND INFORMATION ENGINEERING (COMPUTER ENGINEERING)

London, UK

Sept 2018 – July 2022

- Predicted for First-Class Honours; 3rd Year: 77.46% (Dean's List), 2nd Year: 71.22%, 1st Year: 68.27%

Auckland Grammar School

Auckland, NZ

GCE A LEVELS

Jan 2013 – Dec 2017

- NZ Scholarships: Calculus and Statistics (awarded to top 3% of country)
- A Levels: A*s in Biology, Chemistry, Physics, Mathematics; A in Further Mathematics

Experience

Arm

Cambridge, UK

PART-TIME UNDERGRADUATE – SOFTWARE ENGINEERING

Dec 2020 – present

- Extended Compiler Explorer (written in **JavaScript**) to compile OpenCL C and C++ for OpenCL to Arm assembly and SPIR-V assembly, 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
- Used **Docker** to add infrastructure support for SPIR-V/LLVM Translator in Compiler Explorer
- 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

GPU SOFTWARE ENGINEERING INTERN

June 2020 – Sept 2020

- Integrated the ARM GPU software model with **QEMU** to enable testing via the kernel driver, with the goal of deprecating their usermode driver
- Investigated its feasibility by writing a **Bash** script to automate testing and comparing execution times and the number of passing test cases
- Extended a **kernel driver** written in **C** to allow it to interoperate with QEMU
- Used a memory-backend-file to share memory between the Host and Guest, taking into account their different memory mappings
- Added new interrupt requests to facilitate reading and writing to GPU registers via shared memory
- Implemented virtio-serial consoles to raise interrupt requests using FIFO queues

Imperial College London

London, UK

UNDERGRADUATE TEACHING ASSISTANT

Sept 2020 – present

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

STEM OUTREACH AMBASSADOR

Nov 2018 – present

- Duties involve giving tours of campus to visitors and prospective students, answering questions and providing insights about the College, assisting with virtual and in-person events, mentoring students to promote STEM, tutoring students in A-Level Maths

Projects

Draw2D Library for ISSIE

High Level Programming

- Developed a circuit-drawing library in the functional programming language **F#** for use in ISSIE, a teaching tool for digital circuit design
- Acted as project manager, reviewing pull requests, running meetings, and managing deadlines and deliverables

Keyboard Music Synthesiser

Embedded Systems

- Implemented firmware for a multi-threaded keyboard synthesiser, with support for volume control, octave control, and multiple timbres
- Acted as project manager to ensure code quality and timely completion of deliverables

C to MIPS Compiler and MIPS CPU Simulator

Computer Architecture & Language Processors

- Built a compiler in **C++** to generate **MIPS assembly** from subset of pre-processed C90
- Developed a transpiler to translate a subset of C into equivalent **Python**
- Implemented lexing and parsing functionality using **Flex** and **Yacc**
- Developed 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

A Pigment of Your Imagination

Oxford Hack 2019

- Created an Android app in **Kotlin** and **Java** that turns photos into blank colouring stencils
- Implemented edge detection algorithm and scanline fill algorithms to find shape outlines and fill colours within these lines
- Finalist for Most Stylish Hack

Skills and Interests

Programming

C/C++, F#, Python, JavaScript, Java, Verilog, MATLAB

Tools

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

Other Skills

English (native), Mandarin Chinese (proficient), First Aid, Full UK and NZ driving licences

Volunteering

EIE Department Rep ('21/22), EIE3 Rep ('20/21); elected to advocate for students and pursue course improvements
Treasurer ('21/22), Secretary ('20/21), Publicity Officer ('19/20) of Imperial College Wind Band

Music

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