Ilan Iwumbwe

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Profile

I am keen to learn new skills and become a competent problem solver and engineer. I do this by challenging myself with projects which introduce me to unfamiliar concepts, and exercise my pre-existing skills.

Education

Imperial College London *Oct 2022 – June 2026*
MEng Electronic and Information Engineering

- **First year modules:** Mathematics, Analysis and Design of Circuits, Digital Electronics and Computer Architecture, Programming for Engineers (C++), Electronics Design Project
  Grade: 65%
- **Second year modules:** Mathematics and Statistics, Instruction Architectures and Compilers, Software Systems, Discrete Maths, Control Systems, Signals and Systems, Electronics Design Project
  Grade: 64%

The National Mathematics and Science College *Sept 2020 – June 2022*
A levels

Subjects taken: Further Maths, Maths, Computer Science, Physics
Grade: 4 A*

Experience

Undergraduate Researcher *London*
Imperial College London *July 2024 – Sept 2024*

- Worked with a colleague to write a tool that finds bugs in quantum compilers
- Found 17 bugs in Pytket, Cirq and Qiskit

Software Engineer Intern *Remote*
Imperial College London *June 2023 – Sept 2023*

- Implemented a feature in Issie to allow users to import circuits into their projects
- Redesigned circuit simulation UI to look a bit cleaner

Projects

Technologies used: C, C++, Python, Bash

QuteFuzz *repo*

A bug finding tool for quantum compilers written with a colleague under the supervision of Dr.John Wickerson

I learnt a lot about how to work in a team, and how to communicate and discuss ideas. This allowed the project to go through many iterations while getting improved using input from both of us.

Ylva *repo*

A UCI compliant chess engine.

I had a lot of fun writing the code for Ylva. I learnt a lot of new techniques and strategies for optimising code, that are not only applicable when writing a chess engine.

Tetris AI *repo*

Wrote a genetic algorithm that uses neural networks to learn how to play Tetris.

I learnt about machine learning algorithms, and the maths behind multi-layer perceptions by making research and implementing the neural networks used from scratch.

NandToTetris *repo*

Built a CPU, Memory, and ROM in Hardware Description Language, as well as a compiler, Virtual Machine translator, assembler, and a library to extend the high-level language, Jack, used to write programs for the computer. This was an implementation of Noam Nisan and Shimon Schocken's book, "The Elements of Computing Systems"

This project allowed me to gain a deeper appreciation for the inner workings of the computing stack in a fun and rewarding way.

RISCV-assembler *repo*

A minimal assembler for the RV32I RISCV variant

This project allowed me to exercise my C++ skills while building on top of what we had done in lectures.

RISCV-CPU *repo*

Worked in a team of 4 to implement a CPU capable of running the full RV32I instruction set

I practised my team-working, communication and listening skills. I also gained a deeper understanding of pipe-lining and hazard control

C compiler

Worked in a team of 2 to implement a C compiler targetting RISCV

I gained a deeper understanding of the entire compilation process, from both a theoretical and practical point of view.

Hobbies

Piano, Football, Reading, Bouldering