William Grant

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/wdhg
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Education

Imperial College London **September 2019 - Present**

MEng in Computing (Visual Computing and Robotics)

Pintos **October 2020**

- Built an Operating System from a bare bones framework in C.
- Implemented kernel threads, scheduler, loading and running user programs, and virtual memory.

ARM Emulator and Assembler **May 2020**

- Wrote an emulator and assembler in C for a subset of the ARM instruction set architecture.

Wave Function Collapse MIDI **May 2020**

- Implemented the Wave Function Collapse algorithm in C.
- Applied it to MIDI to generate music.

Kingsbridge Community College **June 2019**

A* in Maths, Further Maths, Chemistry, and Physics.

Work Experience

Software Engineer Intern at Emotech **July 2018**

- Added extra functionality to Olly robot to allow users to request jokes via voice recognition.
- Implemented a Golang microservice to serve trivia questions and answers.
- Extended propriety visual language (Inga) to allow Olly to communicate with trivia micro-service.
- Implemented behaviour using Inga to allow the user to play a game of trivia with Olly.

Skills / Knowledge

Programming

- **Proficient:** Haskell, Java, C, Python, JavaScript, Bash, HTML, CSS.
- **Learning:** Go, Scala, Rust, C#, C++, Lisp, SQL, ASM, ReactJS, Flask, Django, Gin.

Tools, Software, and Services

- **Proficient:** Git, Unity, Blender.
- **Learning:** Docker, Cloudflare, Google Cloud, AWS, Godot, GDB, Valgrind.

DevOps and Software Engineering

- TDD, CI, Microservices, Containers.

Ethical Hacking / Pentesting

- Kali linux, Nmap, Nikto, Hashcat, John the Ripper, Wireshark, THC Hydra

Personal Projects

Over 60 personal projects hosted at github.com/wdhg

Reggie **November 2020**

Encoding and running register machines.

Creep **October 2020**

A concurrent web crawler written in Go.

Genetic Snakes **August 2020**

Implementing the NEAT genetic algorithm to train an AI agent to play a perfect game of Snake.

Bitwise Art **May 2020**

Creating art using bitwise operations.

Gravitational Bodies **April 2020**

Implemented the three-body problem to render the figure-8 solution.

Go Slow **June 2018**

Implementation of the layer 7 'slowloris' DOS attack.

Awards and Achievements

IC Hack 20 **February 2020**

- Competed and won two categories at the largest 24 hour student run hackathon in the UK.
- Built a rendering pipeline to display 2D and 3D graphics on an analog oscilloscope.

Personal

- Participated in several hackathons and game jams including Google's Hashcode, Ludum Dare and GMTK Game Jam.
- Participated in Project Euler and Advent of Code programming challenges.
- Built a 3D printer.
- Interested in Virtual Reality.
- Bouldering.
- Learning to play guitar.