GitHub: github.com/davedissian
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David Avedissian

Education

Imperial College London *2013 – 2016*

BEng Computing (Year 1: Overall 75.1%, Programming 91%)

- **WACC Compiler** – Implemented a compiler as part of a group project written in Go. The source language was named WACC and the target was ARM assembly. The compiler supports type derivation, external C function calls, modules, floats, loop unrolling and function inclining.
- **PiFox** – group project, which won the prize for the best ARM project extension. A bare-metal game written in pure ARM assembly designed to run on the Raspberry Pi. We wrote a 3D rasteriser, implemented sound, and wrote a driver for the NES controller through the Pi's GPIO pins. Garnered 70,000 views on YouTube and was featured on the official Raspberry Pi blog.
  github.com/ICTeam28/PiFox raspberrypi.org/pifox-bare-metal-arm-assembly-language-star-fox
- **PiEmu** – A nearly complete Raspberry Pi emulator developed alongside PiFox. Supports most instructions in the ARM instruction set with an implementation of the floating-point coprocessor and access to a virtual frame buffer. This allowed PiFox to be fully emulated without sound.
  github.com/ICTeam28/PiEmu

The College of Richard Collyer, Horsham *2011 – 2013*

A Level	Maths (A*)	Further Maths (A*)	Computing (A*)	Physics (A)
AS Level	Electronics (A)	Extended Project Qualification (A)		

- Awarded the Netcraft AQA Computing prize for ranking in the top 50 students nationally
- Awarded the Merrett Bequest Award for achieving greater than 600 UCAS points
- Reached the semi-finals of Student Robotics 2013 hosted by the University of Southampton.
- Participated in the British Informatics Olympiad in 2011 and 2012, achieving the highest score in the college in both sittings.

The Forest School, Horsham *2006 – 2011*

GCSE 11 GCSE's (A* - B)

Personal Projects

Transcendent – indiedb.com/games/transcendent *Nov 2012 – Present*

A 3D multiplayer space shooter game written in C++. I wrote the engine myself and make use of open source libraries for rendering, physics, sound and network. Compiles and runs on Windows, Mac OS X and Linux using MSVC, GCC and Clang. I represent a light-year sized game world with millimetre precision, make use of deferred lighting, and bind to Lua to allow player modifications and simplify the engine code. I created all of the artwork myself, and outsourced the production of music. The game's profile on IndieDB had a peak popularity of 49th most popular game. I plan to publish on Steam through the Greenlight process.

Compiler in Rust – github.com/davedissian/compiler-rs *Dec 2014 - Present*

Inspired by the WACC compiler project, and developed using the Rust programming language. The syntax is similar to C and includes type inference. I also wrote an interpreter for the language.

Software Rasteriser – github.com/davedissian/rasteriser-lib *April 2014 - Present*

To improve my knowledge of the graphics pipeline, I developed a 3D software rasteriser library using pure C. The API was deliberately designed to mimic OpenGL. It has a fully programmable pipeline, which makes use of function pointers to implement shader programs, and combined attributes to specify vertex layouts.

Ludum Dare – github.com/davedissian/LD28 *13th – 15th Dec 2013*

A global game jam to create a game and all its assets from scratch in exactly 48 hours. I entered LD #28 in December 2013, and created a 2D bullet hell rogue-like with retro graphics using C++ and SFML. Out of 1200 entries, my game was placed 120th for graphics, and 222nd overall.

Procedural Galaxy Demo *Oct – Nov 2013*

An octree based representation of a spiral galaxy that procedurally generates potentially billions of stars that runs in real-time. I learnt how to write code that reduces memory fragmentation by pre-allocating and reusing large chunks of memory rather than thrashing the heap, as well as procedurally generating data as needed.

DirectX Graphics Engine *May – Sep 2010*

In the summer of 2010 I wrote a simple graphics engine using Direct3D 9, to help me learn about graphics programming and writing complex systems in C++. I implemented a scene graph, a resource cache and links to external libraries for audio and physics.

Employment Record

Pavilions in the Park, Horsham - Lifeguard *Aug 2011 – August 2014*

As a lifeguard I've been responsible for the safety of up to 50 swimmers at once, and cooperated with team members to maintain public safety and, in the case of emergencies, coordinate a prompt and effective response.

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Contract Work

HLSL Global Shader

Apr - May 2010

I was tasked to write an uber-shader written using DirectX's High Level Shader Language for use throughout an indie team's projects. This shader was responsible for all material types and up to 4 simultaneous lights. It supports dot3 normal mapping, combined with per-pixel lighting and detail textures – which was used to simulate dirt on a vehicle in a racing game.

Skills

Operating Systems

I am a proficient user in all major operating systems - actively using Windows, Mac OS X and Arch Linux desktops, with experience managing headless servers in the cloud running Ubuntu. I am a confident user of the Unix shell and regularly write scripts to automate tedious tasks.

Programming Languages and Tools

I am a proficient programmer in many programming languages – C/C++, Rust, Haskell, Lua, Python, Bash, ARM and x86 assembler. I make use of version control using Git and fully use it as a tool to track bugs and contribute to open source projects.

Team Skills and Responsibility

With my experience working as a lifeguard combined with working as a team both on open source projects and group projects as part of my degree has allowed me to develop team skills whilst having important responsibilities.

Interests

Games Programming

I have a profound interest in games programming. I enjoy the technical challenge of designing a complex real time system mixed with the artistic and creative side of game development.

Mathematics

I have a keen interest in mathematics due to the huge range of applications. I am particularly interested in procedural content generation - using mathematical rules to generate content for simulations normally created by artists.

Hardware

I regularly tinker with hardware. I've built and maintain computers for my three siblings and myself; deployed a gigabit CAT5E network in my home; and repair portable devices when they break down. Stemming from my experience with hardware, I've developed and interest in software emulation and during the PiEmu project produced graphics emulation and an interactive debugger.

Networking and Security

I find security, cryptography and web architecture to be very interesting fields. At Imperial I have attended a number of presentations about cryptography, fighting against phishing and protecting networks against unauthorised access.

Other

In my spare time, I enjoy going to the gym and table tennis, which I often play with friends during breaks in the day and evening. Additionally, I've held a full UK driving license for 2 years.