Patrick Gordon

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Programmer for over ten years, currently a professional software developer and research engineer at Hadean. I am the lead developer of Hadean's distributed spatial simulation engine, Aether, and our spatial technology. Working at a startup from the very early stages I have taken on a wide range of responsibilities, including growing our engine development team, researching and designing the spatial technology, and developing it using agile methods.

CEO, Hadean: "I've never seen someone come into a company and have as big an impact as that"

VP Eng, Hadean: "He gets s*** done"

Key Skills

Communication

- Writing many technical but accessible blog posts for our company blog
- Teaching and onboarding within the company
- Communicating externally in a pre-sales role with Partners and Investors
- Promoting the company at events, including Game Developer Conference
- Collaborating with Game Developers, Physicists, Biologists, Engineers and many Software Engineers

Development

- Using my expertise in spatial partitioning and simulation I started and continue to lead development of Aether (Hadean's distributed spatial simulation engine)
- At Createc I developed a spatial processing, storage, and visualisation pipeline on resource constrained hardware
- My final year project at Cambridge was a performant sparse voxel octree raycasting system, for desktop GPUs
    - Dissertation link
- In my spare time I have built:
    - A compiler for a new programming language intending to be used for high performance code on a variety of accelerators (multicore CPUs, SIMD coprocessors and GPUs)
        - LLVM, GLSLang, Lex/Flex, Yacc/Bison, C++
    - A network visualiser for processes distributed across machines
        - Javascript, D3.js, Linux iproute2 tool SS
    - An experimental (tiny) soft 8 bit processor core on an FPGA.
        - Verilog, FPGAs
    - A boot loader in x86 assembly
        - x86 Assembly
    - A dynamic website backed by a database
        - Go, Javascript, HTML, CSS

Tools

- Expert: C, C++, GLSL and GPU programming, Linux, Git, Make
- Experienced: Python, Bash, Javascript, HTML, CSS, CMake, Meson
- Learning: Rust, Nix, Verilog and FPGAs, x86 Assembly

Libraries

- Game Engines and Simulation: PhysX, Eigen, Unreal Engine, OpenGL
- Robotics and Computer Vision: ROS, SLAM,

- Deep Learning: Tensorflow, Caffe,

Education

University of Cambridge, Selwyn College October 2013 - June 2016

- Computer Science, BA (Hons) - 2:1

Nelson Thomlinson School, Cumbria (State Comprehensive) September 2008 - June 2013

- Maths - A (taken one year early - highest grade available)
- Further Maths - A*
- Physics - A

Employment

Hadean September 2018 - Present

- Hadean was a small startup when I joined, looking for market fit in three verticals. After quickly getting up to speed on the HadeanOS technology they were building, I started developing Aether for Gaming, Simulation and Science. We quickly found traction after going to GDC with a small demo. We accelerated development and I helped grow the team, hiring and onboarding new engineers. I grew a huge amount by being the lead developer, getting the chance to work closely with all different business functions.

Createc July 2016, September 2016 - September 2017

- Createc is a cutting edge, research based organisation, primarily working for the Nuclear Decommissioning Industry. In summer 2016 I joined Createc for an internship and, due to my excellent work and attitude, within three days was offered a permanent post. Since then, I have gained valuable experience working with ROS and real-time and embedded systems on drones with radiation sensors. These systems are currently in use in extremely challenging environments at Fukushima (Japan) and Sellafield (UK). I have since worked on deep-learning systems, to classify X-Ray images of baggage as threat or benign, using Caffe on a multi GPU system, and evaluating deployment on an embedded system. I have written algorithms in C for a lightweight, embedded, aerial platform. I worked on a scanner system for industrial purposes, to accurately map, and present potentially hazardous environments remotely. One of my favourite parts of working for Createc is the ability to work with interns to develop their skills further, for example teaching an intern how to debug a device driver written in C. My greatest achievement while working here was developing a back end system to ingest all of the point cloud data, pass it through processing steps, and then display it to a user. This system is in use on multiple different projects that are central to the company. Another rewarding experience, was being asked by the company director to help present the culmination of several months work developing a system to accurately classify X-Ray images as threat or benign to the client (a government body).
- I have experience working developing software to use deep learning on large datasets, on powerful multi-gpu systems. I used MatCaffe and PyCaffe to develop a classification system for X-Ray images from a baggage scanner. I have also developed backend and frontend systems for storage, processing and visualisation of pointclouds with tens of millions of points. This system is currently in use in some of the core products of Createc. I want to be working in a company where I can further develop and share my skills. Also, to be able to make a meaningful contribution to a project, and to see it through from concept, to development, to deployment.

University of Cambridge, Computer Science October 2013 - June 2016

- Due to my outstanding A-level results and passion, I had the great opportunity to study at Cambridge, attaining a 2:1. Among my favourite courses were Machine Learning, Advanced Rendering, Bioinformatics, Comparative Architectures, Computer Vision, and Information Retrieval, I found these particularly rewarding because they focused on understanding large, real-world areas of work. In the second year, I worked with a team (contributing a large part of the code, experience and bugfixes) to develop a game system for an outside company, Frontier. The feedback from the client was that the product and teamwork was excellent.

My final year project was on an advanced voxel ray-tracing pipeline for desktop GPUs, which was written in C/OpenGL/GLSL and which showed a performance increase of 25x over the benchmark version of the renderer. I have been able to show efficiencies such as this in other projects since then and want to build on this in a future role.

Citrix August 2012

- In August 2012, I worked in the XenClient team of Citrix, a multinational virtualisation software provider. At Citrix, I was asked to write an automated test suite for network connectivity, for an interface I had never seen, in a language I had never used before (Python). I swiftly learned the fundamentals of the interface and language. After completion, my work was of such high quality that it was committed to the back end code base. Unbeknown to me, my supervisor had bet his colleagues that I would not be able to complete this task in the time set. I confounded his expectations by learning the new language and completing the whole task in less than two weeks.

Interests

- *National Cipher Challenge* Whilst still at school I reached the final round for the last three years and won two awards. How many people in the whole competition, how many in the final? It is run by the University of Southampton and sponsored by GCHQ, IBM, The British Computer Society and Trinity College, Cambridge.
- *Robotics Engineering and Space Science* I participated in a two week Imperial College Summer School in 2005 when I was only 11 years old. This was led by Dr Richard Palfrey, who said â€œPatrickâ€¦ was able to articulate his ideas extremely well. Patrickâ€™s final presentation (on robotics) was excellent.â€
- *UK Mathematical Challenge* Run by Leeds University. Starting with the regional final in 2008, I achieved a Gold Award and four Silver awards.
- I am keen on Bouldering, Badminton and Cycling, being part of the Selwyn 2nd team for Badminton for 2 years.

References

Available upon request