Ava Gordon

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Senior software engineer, with 15 years of programming experience, 7 professional. Passionate about high performance, large scale computing. Expertise in C++, Python, Linux, eBPF, profiling/optimisation, and GPU programming for graphics and compute. Experience beyond software development includes team leading, management, public speaking, technical writing, interviewing and hiring.

Key areas of interest are:
- Writing high performance software in C++ and Python for CPUs and GPUs
- Developing novel profiling tools for high performance / scale computing
- Spatial data structures and algorithms
- Accelerators including clusters, CPU SIMD, GPGPU, and FPGAs

Tower, August 2023 - Present, Quantitative Developer

I joined the Kailash team with no knowledge of trading. I supported the senior developer in our team, and four months later, we were code-ready to go live.

I developed our C++ risk limits library, and was getting it through the audit process.

I also developed a market data pipeline using clickhouse SQL, gRPC, and C++, this allowed us to have scalable and fine-grained control of the ingestion, cleaning, and aggregation of data.

I was also planning a Kubernetes-based architecture to fulfill our scale, redundancy, and geo-distributed needs for trading for post go-live.

Hadean, September 2017 - June 2023, Senior Research Engineer

Within two weeks of joining this 10 person startup, I started development of Aether (now Simulate) a massively parallel spatial simulation engine for Gaming, Simulation and Science.

Over 5 years later, Hadean was hugely successful with customers and partners in multiple markets including Epic and Microsoft, selling Aether and other products. Hadean had over 100 employees. I was interviewing and onboarding new colleagues. I helped make the software production ready, massively scaled the performance, and developed various profiling tools and methods.

I developed great communication skills, writing technical and accessible blog posts for our company blog, mediating technical decisions and building consensus, training and onboarding within the company, external communication in a pre-sales role with partners and investors, collaborating with many disciplines (Technical Pre-Sales, Game Developers, Physicists, Biologists, Engineers, and many Software Engineers).

I was usually the person called in to either save projects, or make them successful from the start (tech review / architecture).

Createc, July 2016, September 2016 - September 2017, Software Developer

Spatial data processing, sensor fusion, real-time embedded systems / robotics,

machine learning image classification (CNN, Tensorflow, Caffe) on multi-GPU system, embedded computer vision SLAM.

University of Cambridge, 2:1 Computer Science, October 2013 - June 2016

- Studied courses in Maths, Physics, Machine Learning, Advanced Rendering, Bioinformatics, Comparative (System) Architectures, Computer Vision
- Increased performance 25x over the reference implementation of an advanced real-time ray-tracing pipeline for desktop GPUs (C, OpenGL, and GLSL) for my final year project. Optimised the performance with a carefully chosen binary space partitioning tree, like an octree but 64-ary nodes, a stack of parent nodes, and a trick to quickly find the common ancestor node.

Side Projects

- Various C++ open source libraries and utilities
- Compiler for a new programming language for writing parallel code on a variety of accelerators (multicore CPUs, SIMD coprocessors and GPUs)
    LLVM, GLSL, Lex/Flex, Yacc/Bison, C++
- Network visualiser for processes distributed across machines
    Javascript, D3.js, iproute2 SS
- Combined sampling and tracing profiler
    Python, eBPF, DWARF debug info
- 8 bit processor core on an FPGA
    Verilog, FPGAs
- Boot loader in x86 assembly
    x86 Assembly
- Dynamic website with a database backend
    Go, Javascript, HTML, CSS

Published Articles

- Enhanced sampling of protein conformational states for dynamic cross-docking within the protein-protein docking server SwarmDock published in the journal Proteins: Structure, Function, Bioinformatics issue 88 volume 8
- MMORPGs PART 1: It's time to rethink game architectures
- MMORPGs PART 2: Applying data-driven design to optimize computation
- Introducing a new Open Source C++ library for Spatial Representations
- Hitboxes: Giving Your Game Physicality
also re-published in Wireframe Magazine (issue 22, page 30)
- Net relevancy and compression: how to push Gbps of gamestate over the internet
- Optimisation of Voxel Rendering for Large Scenes on Desktop GPUs

Interests

- skiing
- creative coding
- electronic music