TOM RITCHFORD

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Decades of experience; a plethora of projects taken from conception to completion and production, in areas including fintech, DSP, big data, distributed systems and more; hundreds of thousands of lines of working, production code in a dozen programming languages; expert in Python, and C++.

I specialize in rapid development of highly reliable, performant, scalable, minimal, clear and maintainable solutions to difficult problems. “Everything should be made as simple as possible, but no simpler.”

SELECTED EXPERIENCE

CTO, Engora **Jan 2022 – Jan 2023**

Engora is an innovative search engine

Contractor, A-Team **January 2021 – January 2022**

A-Team is a consultancy firm

Lead developer on BiblioPixel, Maniacal Labs **(2016-2019)**

Maniacal Lab’s BiblioPixel is a popular lighting control program for LEDs in strips, matrices, cubes and other layouts, as well as other lighting systems such as the Philips Hue and DMX.

I rewrote it from the ground up, with a REST server for pixel and higher-level control, both code and data plug-ins, animators including video feedback with an IIR filter, and a new data model to numpy arrays, with order-of-magnitude speedup and perfect backwards compatibility.

`Python, C++, Cython`

Senior software engineer at Ripple **(2014-2016)**

Ripple is a financial technology firm with its own eponymous cryptocurrency. I worked for most of my time there on their flagship application rippled, a complex and complicated C++17 cryptoledger named rippled on deployment, debugging, devops, build and monitoring.

`C++, Python`

Sole developer on SlowGold 8, World Wide Woodshed **(2009-2014)**

I had always wanted to write a complete desktop audio application!

World Wide Woodshed’s SlowGold was a leader in music practice software from the 1990s. I bought half the tiny company, and was the sole developer for a brand-new product in C++, with high-quality audio, subtle and intuitive editing tools, and little details like three second startup and shutdown.

`C++`

Software engineer, Google **(2004-2009)**

I joined Google New York as a single floor on Times Square, worked on their first question-answering system, the first Music Search, then its short-lived Real Estate search.

This led me to GoogleBase, a database of tens of billions of items planned for millions of users. Leading a tiny and changing team, over two years we built a universal reporting and computation framework I had proposed and designed. It was still in common use years later.

As a reward for this slog, I was privileged to work on GWS, the front end that generated all Google results pages, for i18n, l10n and translations, and the GWS live experiment framework.

And I interviewed hundreds of engineers, traveling twice to Korea and once to Hungary for this.

`C++, Java, Python`

Senior software developer, Netomat **(2001-2004)**

Netomat had an innovative rich media tool to send Netomat “experiences” – little minisites with animation, sound and internal navigation - to users who could edit them within the email itself.

I designed and wrote the animation engine and front-end, most of the animation types and the manual. Still one of my favorite “neat hacks” ever, I wrote a tool that converted experiences right into Java bytecode, for a huge savings in download and memory size.

`Java`

SKILLS

- Python: numpy, Cython/C++ APIs, Django, Flask, threading and multiprocessing, real-time
- Architecture and high-level design: clean, simple, practical, scale-appropriate designs
- C/C++: modern C++14/17/20, STL, DSP, concurrency, Juce, Boost, real-time, digital audio
- Data analysis and retrieval: clustering, search, data pipelines, MapReduce, log analysis
- Considerable Javascript, extensive git, Linux, and bash
- DevOps: deployment/release/integration, Docker(Compose), monitoring and logging
- Globalization: Internationalization, localization, translation, encodings
- Java: distributed systems, automatic bytecode generation, animation
- Performance optimization
- Fintech: cryptocurrencies, option models
- Real-time systems: digital audio and DSP, lighting control systems, MIDI
- Tool building: see the dashboard at https://github.com/rec

EDUCATION

I have a B.Sc. with First Class Honours in Mathematics from Carleton University, Canada.