

Tom Ritchford

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Summary

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

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."

Skills

- **Architecture** and high-level **design**: clean, simple, practical, scale-appropriate designs
- **C/C++**: modern C++14/17/20, STL, DSP, concurrency, Boost, Juce, real-time, digital audio
- **Python**: `numpy`, Cython/C++ APIs, Django, Flask, threading and multiprocessing, real-time
- **Data analysis and retrieval**: clustering, search, data pipelines, MapReduce, log analysis
- **Java**: distributed systems, automatic bytecode generation, animation
- Considerable **Javascript**, extensive **git**, **Linux**, and **bash**
- **DevOps**: deployment/release/integration, packaging, distribution, monitoring and logging
- **Globalization**: Internationalization, localization, translation, encodings
- **Performance optimization**
- **Fintech**: cryptocurrencies, option models
- **Real-time systems**: digital audio and DSP, lighting control systems, MIDI
- **Tool building**: [safer](#), [gitz](#), [sproc](#), [nc](#), [backer](#), and many other fine tools

Selected experience

Lead developer on [BiblioPixel](#), Maniacal Labs (2016-2019)

Python, C++, Cython

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.

Senior software engineer at [Ripple](#) (2014-2016)

C++, Python

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 cryptolledger named `rippled` on deployment, debugging, devops, build and monitoring.

Sole developer on *SlowGold 8*, [World Wide Woodshed](#) (2009-2014) C++

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 sole developer for a complete rewrite in C++, with high-quality audio, subtle and intuitive editing tools, and little details like three second startup and shutdown.

Software engineer, [Google](#) (2004-2009)

C++, Java, Python

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.

Senior software developer, [Netomat](#) (2001-2004)

Java

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.

Senior software engineer, Earthweb (1997)

Java

Earthweb had an ambitious but unrealistic plan to develop a distributed object system using Java. I was hired to design the virtual community and chat server. Though the company eventually collapsed, I was able to complete a distributed name service which managed a mapping from names to addresses over TCP/IP, and I also got to spend a lot of time playing with Java on someone else's dime.

Education

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

Affiliations and organizations

I am on the board as Senior Technical Advisor to Brooklyn's [Better Networks](#), a system for small political and arts groups to fundraise and to acquire and manage members.

I am on the board of New York's [Faux-Real Theatre Company](#) - high-energy, textually accurate performances of ancient and classic plays. I performed with them as an actor for many years.

Other skills

- French C1, Dutch B2, German B1, Spanish B1, Indonesian B1
- [Music](#): composition; wind instruments, bass, percussion, keyboards, voice