Matt Welsh

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Professional Summary

I am a computer scientist and technology leader with 20 years of experience as an engineering director, software engineer, and professor. I have a strong research background in distributed systems, networks, mobile computing, and embedded systems. I have designed and implemented large systems supporting more than a billion users, deployed wireless sensors on active volcanoes, and published more than 70 scientific papers. I enjoy working on the bleeding edge of technology and developing products to improve the lives of users all over the world.

Experience

VP of Engineering — **Seattle, WA**
OctoML — **April 2020 - present**

I lead engineering for OctoML, a Seattle-based startup developing technology to optimize and secure machine learning models for deployment. OctoML is developing Apache TVM, an optimizing compiler for ML models, as well as cloud-based services to measure, tune, and package ML models for a wide range of hardware backends. As of December 2020, our company is approaching 40 people. I am responsible for working with our engineering teams to set overall technical direction for the company, recruiting world-class engineers, onboarding and mentoring, and building an inclusive company culture. I also contribute as an individual contributor, writing a substantial amount of code.

Software Development Engineer (T6) — **Seattle, WA**
Apple — **January 2020 - April 2020**

I joined Apple as the technical lead and manager of the former Xnor Platform team, as part of the AI/ML organization based in Seattle. We developed new capabilities to support fast model training and inference on Apple hardware, leveraging the special capabilities of Apple's CPU, GPU, and Apple Neural Engine chips.

Principal Engineer — **Seattle, WA**
Xnor.ai — **March 2019 - present**

I was head of the Platform and Systems teams at Xnor.ai, a Seattle-based startup that developed fast, power-efficient AI capabilities for edge devices, such as low-power CPUs. Xnor was acquired by Apple in January 2020. Xnor's technology made it possible to run, for example, 30 fps real-time object and person detection and tracking on an embedded device such as a Raspberry Pi. I was both an individual contributor, designing and building major pieces of our systems, as well as a manager of two teams comprising 12 engineers. Our projects included:

- Xnor's CPU-efficient inference engine, which compresses and optimizes ML models to run on low-power devices.
- Xnor's AI2GO platform (https://ai2go.xnor.ai), a free SDK making it possible to embed fast AI models with just a few lines of code.
- Xnor's infrastructure for model training, testing, benchmarking, continuous integration, and code health.
- Specialized capabilities and integration support for Xnor's largest customer engagements.

Principal Engineer **Seattle, WA**
Google, Inc. **June 2010 - March 2019**

I led the Chrome Mobile team in Seattle and Kirkland, with a focus on optimizing the web experience for users in emerging markets such as India, Indonesia, and sub-Saharan Africa. I started the team and grew it to more than 40 engineers. As a result of our team's work, grew Chrome to more than a billion users in emerging markets. Our work spanned server-side and client-side technologies. Some of my team's projects include:

- Flywheel, a proxy service for compressing mobile web pages, in use by more than 650M users of Chrome, driving tens of billions of queries per day.
- Client-side optimizations to simplify page loading and rendering, using server hinting to tailor the optimizations for individual web pages.
- Adding capabilities to Chrome to enable downloading and prefetching of web content to enable users with intermittent connectivity to browse while offline.
- New browser features to help users discover new web content and more effectively multitask on small screens.

Professor of Computer Science **Cambridge, MA**
Harvard University **July 2003 - July 2011**

Led a research team of more than a dozen graduate students, postdocs, undergrads, and research staff focused on exploring the technology ramifications of tiny, embedded wireless sensors, with applications such as geological monitoring and healthcare.

- We developed new operating systems, network protocols, and programming models for networks of embedded, 8-bit microcontrollers with low-power radios.
- We evaluated our work through deep engagements with domain scientists, deploying sensor networks on two active volcanoes in Ecuador, on street lights throughout the city of Cambridge, and in lab tests for patients being treated for Parkinson's Disease.
- Taught undergraduate and graduate courses on Operating Systems, Computer Architecture, Distributed Systems, and Wireless Networking.
- Awarded tenure and promoted to full professor in 2010.

Senior Researcher **Berkeley, CA**
Intel Research **August 2002 - July 2003**

Following my PhD work at Berkeley, I spent a year at Intel Research, developing a new programming language and compiler chain for embedded wireless sensors, called NesC. This work was published in PLDI 2003, won the "most influential paper" award 10 years later, and has been cited more than 2500 times.

Skills

- I am an expert in machine learning systems, operating systems, networks, wireless, mobile computing, and distributed systems, and have published and served on program committees for conferences in these areas.
- Long track record of driving successful technology projects, ranging from academic research efforts to multi-team projects supporting more than a billion users.
- Strong technical background in software development, fluent in Go, Rust, C++, C, Java, Python, and SQL, with extensive experience developing for Linux, Android, and mobile web platforms.

- Seasoned organizational leader with experience building, scaling, and reorganizing teams; mentoring and career development; managing performance and balancing engineering investments.
- Strong communication skills as an author of many scientific articles and books, as well as experience as a teacher, technical speaker, and mentor.
- I am passionate about leveraging technology to address humanitarian needs and improve the lives of people.

Education

Ph.D., Computer Science **UC Berkeley, December 2002**

Thesis title: *An Architecture for Highly Concurrent, Well-Conditioned Internet Services*

Masters of Science, Computer Science **UC Berkeley, December 1999**

Bachelor of Science, Computer Science **Cornell University, May 1996**

Full academic CV with publication list is available at https://www.mdw.la/mattwelsh-cv.pdf