

I am a seasoned software developer with over fifteen years of professional full-time experience. I have gained an abundance of experience in large, distributed, scalable systems and have had the opportunity to develop strong domain knowledge in image processing, image transformation, and image optimization with a focus on use for the web. I take a fundamentals-first approach to software development which has led to successful, durable, and maintainable technologies at a global scale.

## Skill Highlights

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- Software Architecture and Design, Distributed Systems, Performance and Scalability, Cloud Computing, Full Stack Development
- Linux, BSD, UNIX, Virtualization, Containerization and Namespaces (like used by Docker and Podman)
- Package Management, Software Supply Chain, Portability, Contributing to Open Source
- Java/JVM, C, C++, x86 Assembly, SIMD, POSIX Shell and derivatives, Multithreading
- Image Optimization, Image Transformation, Image Processing, Computer Vision
- Adaptable to learning new and unfamiliar technologies and systems

## Experience

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### Akamai Technologies *Principal Software Engineer*

*Ottawa, Ontario, Canada*

#### February 2012 – November 2024

- Domain specialist and primary developer for image and video processing, transformation, and optimization for the Akamai Image & Video Manager product.
- Researched, implemented, and augmented computer vision algorithms for performing “Perceptual Quality” image optimization to maximize image compression without compromising image fidelity as perceived by humans. This process necessitated high throughput and high scalability on general purpose CPUs.
- Developed a source-based, hermetic package manager to manage system dependencies with focuses on portability, patchability, reproducibility, supply-chain management, vulnerability mitigation, and — especially — ease of development. Initially intended to get new technical team members up and running quickly, it evolved into also being our production dependency manager.
- Coordinated with Mozilla and Google to ensure Firefox’s support for AVIF images was colour-correct and compatible with the images produced by Image & Video Manager.
- Optimized many image processes to improve the scalability and COGS of Image & Video Manager. These optimizations were as low-level as raw x86\_64 Assembly to directly take advantage of SIMD AVX2/AVX-512 with up to 20x improved throughput on the most critical bottlenecks.
- Open Source contributions to ImageMagick to improve AVIF and HEIC functionality as well as bug fixes.
- Co-authored the 2016 O’Reilly Media published book: *High Performance Images: Shrink, Load, and Deliver Images for Speed*
- Developed a constant and steady stream of developer and support tooling to help simplify developing, debugging, testing, servicing, and selling Image & Video Manager.
- Consulted directly with customers and prospective customers on-site and remotely on technical matters for both support and sales purposes.
- Prototyped, on my own initiative, to concretely show the value of a Functions As A Service (FaaS) compute technology using micro-VMs and a custom Linux distribution able to boot in under 40ms. Focused on multi-tenant isolation, security, and scalability.
- Developed a Java-based web application server framework focused on minimizing complexity, simple debugging, and front-line global scalability. This framework was developed for Image & Video Manager but was then adopted by other products like Akamai EdgeKV and internal tools.
- Developed image optimization features for the Front-End Optimization product that were spun off to create the Image & Video Manager product.
- Designed, developed, and coordinated the integration of the Blaze.io transformation proxy functionality into the Akamai Ghost proxy.
- Promoted from Senior Software Engineer to Senior Software Engineer II and finally to Principal Software Engineer.

## Blaze.io *Software Engineer*

Ottawa, Ontario, Canada

### August 2011 – February 2012

- Software development for the web Front-End Optimization product in a startup environment.
- Designed and developed an automated optimization to execute, render, and cache client-side JavaScript in an intermediary proxy between the client and the origin server in order to reduce browser execution time on end-user devices.
- Blaze.io was successfully acquired by Akamai Technologies in February 2012.

## IBM *Software Engineer*

Ottawa, Ontario, Canada

### July 2009 – July 2011

- Software development for the IBM J9 Java Virtual Machine (now known as Eclipse OpenJ9) Memory Manager (Garbage Collector).
- Improved GC performance by reducing locking, improving thread locality, and developing new strategies for when to tenure objects when using the generational concurrent GC.
- Overhauled GC observability and metrics through the detailed and machine readable but human friendly “verbose GC” system.

### January 2006 – August 2008 *5x 4-month internships*

- Extreme Blue internship developing automated Java bytecode optimizations for improving application startup time.
- Extreme Blue internship developing developer tools for discovering, warning on, and refactoring source code duplication and almost-duplication.
- EPIC internship creating new developer tooling to collect metrics, organize, visualize, and assign ownership of compiler warnings when building the J9 Java Virtual Machine. This tool was used to bring the number of compiler warnings for a build from tens of thousands to zero in a matter of months.
- EPIC internship developing source control management tooling for the Rational Team Concert (RTC) product.
- EPIC internship developing the Eclipse Graphical Modelling Framework (GMF).

## Education

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### University of New Brunswick *Bachelor of Computer Science*

Fredericton, New Brunswick, Canada

### September 2004 – April 2009

- Graduated with honours
- Co-op designation
- ACM International Collegiate Programming Competition (ICPC)
- UNB Programming Club
- UNB Robotics Competition
- Undergraduate Lab Assistant
- Computer Science Peer Mentor
- Computer Science Association

## Notable Publications

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- ***High Performance Images: Shrink, Load, and Deliver Images for Speed***  
Book — Co-Author — O'Reilly Media — Published November 2016
- ***Automated Injection of Java Bytecode Instructions for Java Load Time Optimization via Runtime Checking with Upcasts***  
Patent US8161470B2 — Co-Inventor — Filed August 2007, Granted April 2012

## Miscellany

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- Proficient in French
- Enthusiastic about the BSDs and would love the opportunity to use them professionally
- Modular synthesizer performer and synthesizer enthusiast
- Was previously a Resident DJ in Ottawa