

# Jacob Wirth

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Home Address: Ottawa ON, Canada

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## Technical Qualifications

- **Programming Experience**
  - Proficient in a wide variety of languages, including C/C++, Java, Go, and Ruby
  - Experience in low-level programming
    - Assembly experience for JVM, ARM, x86
    - Reverse engineering experience
  - Concurrent and multi-threaded design
  - Automated software testing and automation
  - HTTP and network protocols
  - Graphics and GPU programming (OpenGL, GLSL)
  - Bash and shell scripting for unix-based systems
  - Source control using Git, Mercurial and SVN
- **Web Experience**
  - Experience with both client and server-side applications using various libraries
    - Go, Node.js, Ruby, PHP
    - Web Services: Nginx, Varnish, Apache
- **Databases**
  - MySQL, Sqlite, PostgreSQL, MongoDB
- **Hardware Experience**
  - Programming embedded systems
  - Circuit design / assembly, board design, soldering
  - Hardware debugging with various equipment

## Education

- **Candidate for Bachelor of Software Engineering - Co-op Program**
  - University of Waterloo
  - September 2012 - April 2017

## Work Experience

### Shopify Inc - Developer Intern

- **September 2016 - December 2016 (Data Infrastructure Team)**
  - Created a software license server proxy to allow for better license control
  - Set up automated cluster deployments using Chef and Cloudera
  - Continued to maintain Toxiproxy software and documentation

### Stripe Inc - Developer Intern

- **January 2016 - April 2016 (Systems Team)**
  - Worked on implementing an improved webhook queuing system

### Shopify Inc - Developer Intern

- **May 2015 - August 2015 (Developer Tools Team)**
  - Worked with a team to switch CI testing over to Buildkite
  - Improved CI runtimes by implementing more advanced queuing techniques.
- **September 2014 - December 2014 (Stack / Resiliency Team)**
  - Developed Toxiproxy for resiliency testing
  - Improved existing "chaos monkey" resiliency testing service
- **January 2014 - April 2014 (Operations Team)**
  - Implemented Collins (developed by Tumblr) for infrastructure management
  - Was part of patching Heartbleed across all servers
- **May 2013 - August 2013 (Security Team)**
  - Implemented audit trail logging within Shopify core
  - Developed some credit card processing code / services

### Sage Data Solutions - Software Developer

- **Summer 2012 and 2011**
  - Updated existing software to fix bugs and improve performance
  - Developed a web reporting utility to fit the needs of a client
  - Developed a new piece of software for tracking security patrols (On Desktop, Handheld, and Web)
  - Technologies Used: Visual C#, Visual Basic, PostgreSQL, HTML, CSS, ASP.NET, Mercurial

## Significant Projects

For more details, source code, and other projects see [the xder](#) and [frustra](#) on github.

- **Stray Photons - Capstone Design Project (2017)**
  - A novel implementation of Global Illumination in 3D rendering
  - Uses advanced lighting techniques to create unique puzzle mechanics
  - Awarded 3rd place prize at the UWaterloo Software Engineering Design Symposium
  - Created from scratch using C++, OpenGL, and GLSL
- **Toxiproxy - Resiliency testing proxy (2015)**
  - Developed at Shopify for programatically simulating network conditions in tests
  - Has gained a fairly large following on Github
  - Created using Go
- **mods.io - Minecraft Mod Hosting (2014)**
  - File hosting for Minecraft mods that pays authors a revenue share
  - Created using Go, Revel, Gorp, MySQL, Redis
- **cdn.frustra.org - Custom built, high performance CDN (2014)**
  - Serves files for mods.io and portal2sounds.com
  - Location based routing, low cost, high benchmark figures (4000 req/s per \$5 server)
  - Created using Varnish, nginx (For SSL proxying), Route53 (DNS), DigitalOcean servers
- **BBCode Compiler (2014)**
  - A very fast BBCode parser and compiler for rendering html pages
  - Created using Go
- **Wat Do? - Time Management Utility (2013)**
  - Prioritizes and displays assignments in an easy to use web interface
  - Created using Node.js, Jade, LESS, MongoDB
- **Custom 3D Renderer (2012)**
  - Renders objects on the CPU without using any external libraries
  - Created using Java
- **TetrUs - Co-operative Multiplayer Tetris (2011, Updated 2014)**
  - Uses peer-to-peer networking for connecting between players
  - Created using Node.js, Javascript, Web Sockets and WebRTC
  - Originally created using Java and Java Sockets
- **MyCraft - Minecraft Mod Loader (2011)**
  - Uses Java bytecode manipulation to modify minecraft and load mods
  - Over its life, MyCraft received over 1,000,000 unique downloads
  - Created using Java, ASM Library (Previously used BCEL)

## Awards and Achievements

- Software Engineering Entrance Scholarship (University of Waterloo, 2012)
- 100%, Grade 12 Programming course - taken in Grade 11. (Sir Robert Borden High School, 2011)
- Proficiency Award in Computer Science (Sir Robert Borden High School, 2011)
- Completed Stripe - Capture the Flag 2.0, (#709, 2012)
- Completed / 1st Place Stripe - CTF3 (#1, 2014) Writeup