James Houghton

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Experience

May 2020 – Aug 2020 | Software Engineering Intern at Google, LLC.
Google Cloud, Virtual Machine Migration
Created a replacement post-copy memory migration system using the `userfaultfd` Linux kernel API that integrates into the current Google proprietary hypervisor. This allows virtual machines to page-in data as needed after changing physical hosts. The system is compatible with the multi-pass pre-copy migration system currently used at Google.

Jun 2019 – Aug 2019 | Software Engineering Intern at Google, LLC.
Actions on Google Developer Platform
My goal was to decrease user-perceived latency as much as possible. Designed and created the streaming responses feature, allowing third-party applications to send responses in parts. Made significant improvements to overall performance, reducing overall system latency by about 25%. Achieved using both static and dynamic analysis, working in C++11.

Jun 2018 – Sep 2018 | Junior Software Consultant at Treliant Risk Advisors, LLC.
Created foreign correspondent banking monitoring tool which detected various types of suspicious behavior. Back-end and command-line interface developed with R, `data.table`, and `Rshiny`.

Jun 2016 – Jun 2018 | Lead Web Developer at Insight Interfaces, LLC.
Full-Stack Development and Cloud Deployment
Created a browser-based remote teleconferencing application built on top of WebRTC. Developed with the Django web application framework, the Node.js runtime, Socket.IO, Redis, and Docker. Became familiar with cloud deployment with AWS EC2/EB and Google's Compute and Kubernetes Engines. Honed front-end JavaScript development and webpage design skills in CSS.

Education

May 2020 **University of Virginia** - B.S. in Computer Science, B.A. in Mathematics - GPA: 3.91
- Teaching Assistant for Operating Systems, Spring 2019 – Spring 2020
- Relevant Coursework: Algorithms, Operating Systems, Learning Theory, Statistical Machine Learning, Computer Architecture, Internet Scale Applications, Differential Equations, Probability Theory, Complex Analysis

Jun 2017 **Thomas Jefferson High School for Science and Technology**
Fairfax County Advanced Studies Diploma - GPA: 4.5 (Weighted)
- Relevant Coursework: Artificial Intelligence, Parallel Computing, Computer Vision, Quantum Mechanics and Electrodynamics, Advanced Math Techniques for Scientists and Engineers

Skills

Programming:	C++17, C, Rust, R, Python, Java, x86 Assembly
Web Application Development:	JavaScript, PHP, Django, CSS3, HTML, EC2, GCP, GKE
Version Control and Build Systems:	git, CMake, GNU Make, Perforce
Linux & System Administration:	nginx, Salt, Docker, Kerberos, KVM, Bash, GPG

Projects

Fingerprintability Analysis of Tor Browser Traffic over Obfs4 (May 2020)
Created system to capture and analyze Tor traffic, and applied it to homepage fingerprinting. I evaluated the fingerprintability of web traffic that was obfuscated by the obfs4 pluggable transport. Findings detailed here.

Console-based video viewer (Jun 2018)
Created a console-based video display for use without an X server, typically over SSH. Used `libav` to read video frames, and displayed them using ANSI color escape sequences in supported terminals.

Multi-threaded Wikipedia indexer & Wikipedia game solver (Jan 2018)
Used with mutexes, condition variables, and atomic variables to create fast, synchronized multi-threaded code. Wikipedia graph searching is done using parallelized BFS, and HTML parsing is done using C++ regular expressions.