Walton G. O'Connor

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github/waltoconnor

Research

Multifractal Properties of Internet Traffic **June-Dec 2022**

- Developed high performance network analytic tools to discover fractal patterns in internet traffic using **Rust** and **Python**
- Automated the collation of results in to PDF reports using **Reportlab**
- Deployed analysis tools to several college campuses using **NixOS**

Cedar Dataplane Telemetry System **June 2019-June 2022**

- Built full stack system for controlling Broadcom dataplane telemetry switch, including low level driver in **C** and Rust, control and result handling server with **CUDA** and **Elixir**, and high level web interface in **Typescript** and **D3.js**
- Deployed system to compute cluster using **Docker** and **Nomad**/**Kubernetes**
- Used system for detecting DDoS attacks and port scanning; and monitor network health with campus network traffic
- Used **R** and **Pytorch** to apply statistical analysis and machine learning techniques to generated results in order to infer household download speed from traffic metadata in conjunction with the Oregon Broadband Office
- Work funded via NSF REU grant
- **Publication:** Chris Misa, Walt O'Connor, Ramakrishnan Durairajan, Reza Rejaie, & Walter Willinger (2022). Dynamic Scheduling of Approximate Telemetry Queries. In 19th USENIX Symposium on Networked Systems Design and Implementation (NSDI 22) (pp. 701–717). USENIX Association.

Accelerated Tiling Solver **June-Oct 2017**

- Created high performance program in **C++** to solve combinatorics problem involving placing tiles on a grid whose solutions were important constants for cohomological objects.
- Optimized with hand rolled x86 **Assembly**; accelerated program using CUDA providing a $1000\times$ speedup
- Further accelerated system by distributing program across campus computers, wrote control and result collection server in **Java**

Employment

Software Engineer **M Financial** **Jan-June 2018**

- Converted manual process of tabulating end of month accounts to a **CD/CI** pipeline that automated what was previously a week of work for six actuaries
- Task involved collecting data from a number of internal partner companies and internal sources, applying business rules, and updating a set of **SQL** databases
- Wrote a variety of wrappers and web interfaces using **HTML**, **CSS**, and **Javascript** to ease the process of testing the consistency of the incoming data and the validating it before committing it to the database
- Required strong interpersonal skills to normalize and unify many disparate workflows under one umbrella and handle the transition to the new system

Intern Software Developer **M Financial** **July-Dec 2015**

- Built internal webapp using **Node.js** and **SQL** that plotted concentrations of life insurance customers on a map of the United States for risk management analysis
- Wrote analysis suite that allowed a user to select regions of the map and view historical and projected future trends in customer demographics

Education

MS in Computer Science **University of Oregon** **Dec 2022**

- Networking and Network Security, High Performance Computing, Machine Learning, Programming Language Theory
- GPA: 3.9

BS in Computer Science **University of Oregon** **June 2020**

- Operating Systems, Compiler Design, Machine Learning, Algorithms and Data Structures, Statistics
- GPA: 3.86

Other Skills

Linux, Git, C#, Haskell, Kotlin, OCaml, Bash, Wireshark, VMWare, ZFS, GlusterFS, SystemD, OpenMPI, OpenACC, OpenCL, numpy, scipy, matplotlib, tidyverse, Vue.js, React.js, InfluxDB, Flask, Vulkan, OpenGL, embedded systems