

# ROBERT MACDAVID

Software Engineer

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## SKILLS

### General —

Linux, Git, AWS, Cloudformation, CI/CD, Nix, Vim, IntelliJ IDEA, Python Notebooks, Docker, gRPC, Numpy, Pandas

### Networking —

ONOS, Wireshark, Scapy, Intel Tofino Programmable Switches, Software-Defined Networking

## LANGUAGES

### Python



### P4\_16



### Clojure



### Java



### C



## HOBBIES

Running, Indoor Climbing, Swing Dancing, Being Employed, Illustration

## EDUCATION

### Princeton University

2016 — Present

#### Ph.D. in Computer Science

**Dissertation (WIP)** - Building Scalable Access Networks With Commodity Switches

**Advisor** - Jen Rexford

#### M.S.E. in Computer Science, GPA 4.0

2014 — 2016

**Thesis** - Compression of Interdomain SDN Policies at Exchange Points

### Rutgers University

#### B.S. in Computer Science, GPA 3.45

2009 — 2014

## WORK EXPERIENCE

### Fill It Local

#### Fullstack Web Developer

2023 — Present

Designed and deployed web application infrastructure on AWS, automated using Cloudformation and Gitlab CI. Wrote a web app using AWS, Cloudformation, PostgreSQL, Clojure, Java, React, Nginx, Nix, and Linux.

### Open Networking Foundation

#### Research and Software Development Intern

2020 — 2021

Designed, developed, and deployed a 4G/5G core router on a multi-campus 5G test deployment. Dataplane was written in P4 for the Intel Tofino switch, control plane was written in Java on top of the Open Networking Operating System (ONOS).

### Microsoft — Redmond

#### Research Intern

Summer 2017, Summer 2018

2017 — Optimized an experimental router dataplane for Azure datacenters, increasing IPv6 route storage by ~20x. Created a command-line control plane interface for researchers.

2018 — Analyzed trends in network outages and mitigations using simple machine learning techniques.

### Princeton University

#### Teaching Assistant

2014 — 2020

**Courses Taught:** COS 226 - Algorithms & Data Structures (twice), COS 217 - C & Systems Programming, COS 126 - Intro to Computer Science (x2)

#### McGraw Teaching Fellow

2014 — 2020

Designed and led a two-day Teaching Assistant Orientation workshop twice per year. Performed classroom observations for instructors seeking a teaching certificate.

## SELECT PUBLICATIONS

**Scalable Real-Time Bandwidth Fairness in Switches** (*Awarded Best Paper!*) INFOCOM 2023  
Robert MacDavid, Xiaoqi Chen, Jen Rexford

**A P4-based 5G User Plane Function** SOSR 2021  
R. MacDavid, C. Cascone, P. Lin, B. Padmanabhan, A. Thakur, L. Peterson, J. Rexford, O. Sunay

**Concise Encoding of Flow Attributes in SDN Switches** (*Awarded Best Paper!*) SOSR 2017  
R. MacDavid, R. Birkner, O. Rottenstreich, A. Gupta, N. Feamster, J. Rexford

**An Industrial-Scale Software Defined Internet Exchange Point** NSDI 2016  
A. Gupta, R. MacDavid, R. Birkner, M. Cannini, N. Feamster, J. Rexford, L. Vanbever