Edward Oakes

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Research Interests

Cloud Computing; Operating Systems; Distributed Systems; Networking

Education

University of California, Berkeley **Berkeley, CA**
MS/PhD Program, EECS *August 2018 –*

- Advisor: Scott Shenker

University of Wisconsin-Madison **Madison, WI**
Bachelor of Science, Computer Sciences *May 2017*

- Certificate (Minor) in Mathematics

Experience

UC Berkeley NetSys Lab **Berkeley, CA**
Graduate Student Researcher *August 2018 –*

- Ongoing work on a secure, privacy-aware data sharing platform that enables internet users to control how their data is shared between applications and advertisers
- Ongoing work on a storage system for serverless computing infrastructure that increases performance of data-intensive workloads and exposes critical consistency mechanisms

Uber Technologies, Inc. **Palo Alto, CA**
Software Engineering Intern *May 2018 – August 2018*

- Instrumented, evaluated, and optimized peer-to-peer file distribution system for Docker container image deployment and extremely large files (i.e., 100s of GB)
- Rewrote core engine for Makisu (https://github.com/uber/makisu), a replacement tool for Docker that enables distributed caching and faster, more portable container image building

comScore, Inc. **Madison, WI**
Data Scientist *Aug 2017 – May 2018*

- Designed, implemented, and validated an automated machine learning pipeline using Apache Spark to classify behavioral characteristics in petabyte-scale web browsing data
- Automated the identification and filtering of non-user-initiated internet traffic using machine learning techniques, mitigating hundreds of hours of manual work per month

ZeroStack, Inc. **Mountain View, CA**
Software Engineering Intern *May 2017 – Aug 2017*

- Built a highly scalable metric-based alerting system which processes high volume streams of data and evaluates customer-specified rules to generate and manage alerts
- Integrated PagerDuty events into the SaaS platform to support customers in responding to events in their private cloud

Wisconsin Advanced Systems Laboratory/Microsoft Jim Gray Systems Lab **Madison, WI**
Research Assistant *May 2016 – May 2017*

- Designed, wrote, and tested rigorous Golang code for the core of OpenLambda including applications in networking, database management, and Linux containers

- Performed analysis on over 1,000,000 GitHub Python repositories as well as the PyPI repository to inform the design of integrated package support in OpenLambda
- Designed, built, and evaluated a secure package caching mechanism to enable sharing packages between customers in OpenLambda
- Created serverless-optimized containers which reduced latency by 10x and increased total throughput by 20x in OpenLambda

Wisconsin Human-Computer Interaction Laboratory **Madison, WI**
Research Assistant *Sept 2015 – Sept 2016*

- Designed and implemented a route planning algorithm to support subjective driver goals
- Built a route planning web application using Flask to run an in-person study, evaluating the effectiveness and usability of our route planner

CBRE **Brookfield, WI**
Data Analyst Intern *May 2015 – Sept 2015*

- Analyzed customer building automation data to eliminate inefficiencies, reducing energy and labor costs
- Performed text analysis on written reports using machine learning techniques to predict hardware failures before they occur

Publications

- Edward Oakes, Leon Yang, Dennis Zhou, Kevin Houck, Tyler Harter, Andrea C. Arpaci-Dusseau, and Remzi H. Arpaci-Dusseau, "SOCK: Serverless-Optimized Containers," *2018 USENIX Annual Technical Conference*, Boston, MA, 2018
- Edward Oakes, Leon Yang, Kevin Houck, Tyler Harter, Andrea C. Arpaci-Dusseau and Remzi H. Arpaci-Dusseau, "Pipsqueak: Lean Lambdas with Large Libraries," *2017 IEEE 37th International Conference on Distributed Computing Systems Workshops (ICDCSW)*, Atlanta, GA, 2017
- Scott Hendrickson, Stephen Sturdevant, Edward Oakes, Tyler Harter, Venkateshwaran Venkataramani, Andrea C. Arpaci-Dusseau, and Remzi H. Arpaci-Dusseau, “Serverless Computation with OpenLambda,” *;login: The USENIX Magazine, Winter 2016, Vol. 41, No. 4*

Talks & Presentations

- "SOCK: Serverless-Optimized Containers"
  - *2018 USENIX Annual Technical Conference, Boston, MA, 2018*
- “Kraken: P2P Distribution of Large Files in the Datacenter”
  - *Uber Infrastructure Summit, San Francisco, CA, 2018*
- “Pipsqueak: Lean Lambdas with Large Libraries”
  - *First International Workshop on Serverless Computing*, Atlanta, GA, 2017
  - *SCI Labs Research Meeting,* Madison, WI, 2017
- “Serverless Computation with OpenLambda”
  - *Wisconsin Advanced Systems Lab Research Meeting,* Madison, WI, 2016
- “Supporting Subjective Driver Goals in Route Planning”
  - *Wisconsin Human-Computer Interaction Lab Research Meeting,* Madison, WI, 2016
  - *Toyota CSRC Visiting Scientist Presentation*, Madison, WI, 2015

Awards & Honors

- UC Berkeley University Fellowship 2018-2020
- NSF Graduate Research Fellowship Program Honorable Mention 2018

- Wisconsin Academic Excellence Scholarship 2014-2017
- UW-Madison Dean's List: Fall 2014, Fall 2015, Fall 2016