Drew Ripberger

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Education

The Ohio State University — Columbus, OH
Bachelor of Science in Computer Science and Engineering; GPA: 3.92 — *Aug. 2020 – Expected Dec. 2023*
With Summa Cum Laude Honors

Awards

The Ohio State University Computer Science Department — Columbus, OH
Shan and Qian Shan Kuo Endowed Scholarship — *Award of $2,000*
Undergraduate Research Award — *Award (1 of 2 recipients) of $1,000*

Publications

[1] Y. Hui, D. Ripberger, X. Lu, and Y. Wang, "Learning Distributed Protocols with Zero Knowledge," in *Machine Learning for Systems Workshop at NeurIPS 2023*, 2023.

[2] D. Ripberger, Y. Gan, X. Ren, S. Blanas, and Y. Wang, "IsoBugView: Interactively Debugging Isolation Bugs in Database Applications," *Proc. VLDB Endow. (Demo Track)*, vol. 15, no. 12, pp. 3726–3729, Aug. 2022, ISSN: 2150-8097. DOI: 10.14778/3554821.3554885.

[3] Y. Gan, X. Ren, D. Ripberger, S. Blanas, and Y. Wang, "IsoDiff: Debugging Anomalies Caused by Weak Isolation," *Proc. VLDB Endow.*, vol. 13, no. 12, pp. 2773–2786, Jul. 2020, ISSN: 2150-8097. DOI: 10.14778/3407790.3407860.

Experience

Research Assistant — Mar. 2019 – Now
Ohio State Systems Group with Professor Yang Wang — *Columbus, OH*

- Helped develop and test IsoDiff and IsoBugView which were VLDB 2020 and VLDB 2022 Demo Track publications respectively
- Investigating using machine learning to create and verify new distributed protocols, resulting in our ML For Systems 2023 workshop paper: Learning Distributed Protocols with Zero Knowledge
- Participated and presented in the group's weekly systems reading group where we reviewed papers from recent systems conferences

Research Assistant — Aug. 2023 – Now
Ohio State SecLab with Professor Zhiqiang Lin — *Columbus, OH*

- Evaluating methods for performing efficient dynamic taint analysis
- Investigating how we can propagate taint during program execution without tracking flow
- Implementing a new `libdft` library using Intel's Pin tool to implement our novel flow tracking

Software Engineering Intern, Performance and Scale Team — May 2023 – Aug. 2023
Red Hat — *Boston, MA (remote)*

- Worked on evaluating the Trimaran load-aware scheduler for use in Red Hat Open Data Science (RHODS)
- Designed large scale tests to evaluate the Trimaran scheduler under heavily load and in massive clusters
- Collaborated with the Performance and Scale Team and IBM Research to determine optimal use cases for the various scheduling strategies
- Used systems automation tools including Ansible and Python to coordinate reproducible and open source tests

Undergraduate Research Intern — Jun. 2022 – Aug. 2022
Microsoft Research — *Redmond, WA (remote)*

- Learned about zkSNARKs, proof systems, and other cryptographic primitives while being mentored by Dr. Srinath Setty
- Worked with Dr. Setty on demonstrating and understanding the efficacy of incremental SNARKs
- Created a provable end-to-end banking transaction processing library in Rust based on recently published Nova recursive SNARKs

- Wrote constraints to encode operations on merkle trees and signature verification into R1CS circuits

Undergraduate Research Intern Apr. 2021 – Aug. 2021
HyperThought Group at Ohio State *Columbus, OH (remote)*

- Created infrastructure for parsing and storing unstructured image metadata using Python
- Developed code to detect defects in metals from electron microscopy images using OpenCV
- Collaborated with the Air Force Research Labs to interface and upload images and metadata onto the HyperThought system for further analysis and identification
- Assisted in writing an extended abstract and talk for Microscopy & MicroAnalysis 2021 on how HyperThought can help doing large scale analysis of microscopy data

Software Engineering Intern Mar. 2020 – Aug. 2020
Nirmata *San Jose, CA (remote)*

- Worked to help develop observability solutions to supply data upstream to Nirmata's Kubernetes management dashboard
- Used Go, eBPF and the Kubernetes API to construct a DaemonSet that monitors a cluster's network
- Presented the project to the CEO, CTO and VP of Engineering and wrote the project's announcement blog post
- Spoke at KubeCon + CloudNativeCon North America 2020 about my work developing kube-netc and entering the Kubernetes space: "A High-Schooler's Guide to Kubernetes Network Observability"

Activities & Involvement

- *Girls Who Code* instructor and organizer (2019)
- *Design Develop Deploy (D3)* member (2020-2021)
- Ohio State CSE Undergraduate Peer Mentor (2022)

Technical Skills

Languages: Rust, C/C++, Java, LaTeX, JavaScript, SQL, Python
Tools & Systems: Git, Docker, eBPF, Linux, Prometheus, Kubernetes