

Muhammed Ugur

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EDUCATION

Yale University

Ph.D. in Computer Science

New Haven, CT

Aug. 2022 – Present

University of Michigan

M.S. in Computer Science and Engineering; GPA: 4.00/4.00

Ann Arbor, MI

Sep. 2020 – May 2021

University of Michigan

B.S. in Computer Science with Honors, Minor in Mathematics; GPA: 3.84/4.00

Ann Arbor, MI

Sep. 2016 – May 2020

Thesis: Feasibility of Client-side Browser Script Rewriting

Advisor: Prof. Harsha Madhyastha

RESEARCH

Areas: Compilers, Computer Architecture, Machine Learning, Operating Systems

Topics: Profile-guided Optimizations, Hardware/Software Co-Design, Machine Learning Systems

Computer Science and Engineering, University of Michigan

Ann Arbor, MI

Research Assistant, Advisor: Prof. Baris Kasikci

March 2021 – July 2022

- **Profile-guided Hints for Branch Prediction:** Researched methods to provide profile-based hints to branch predictors through hardware/software co-design. Targeted state-of-the-art predictors with a focus on optimizing the performance of popular data center applications. Initial work accepted into **YArch '22 at ASPLOS '22** and final paper accepted in **MICRO '22**.
- **Linux Kernel PGO:** Applied compiler-based profile-guided optimizations on the Linux kernel using both GCC and Clang. Studied how combining kernel profiles for different datacenter applications affects system performance. Initial findings accepted into the **2021 PLDI SRC** and also invited to appear in **ACM SIGOPS Operating System Review '22**.
- **ML Input Pipeline Profiling:** Researched input fetch and pre-processing bottlenecks in different ML models using NVIDIA's DALI framework. Profiled these workloads at a low-level granularity on different GPUs in datacenter environments using CloudLab to determine performance bottlenecks.
- **PGO for CPU Inference:** Analyzed computer vision workloads from MLPerf Inference to determine CPU bottlenecks in PyTorch and TensorFlow. Applied profile-guided vectorization optimizations to improve latency.

EXPERIENCE

Clinic Inc.

Ann Arbor, MI

Software Engineer

Sep. 2019 – Feb. 2021

- **Crowdsourcing Server:** Built a new crowdsourcing service for the conversational AI platform to gather data for classification and NLP models. Deployed server into production and handled features for crowdsourcing across platform and infrastructure. Implemented crowdsourcing related CI/CD pipelines.
- **Full-Stack Development:** Developed features related to AI model version control and parsing query logs. Revamped the crowdsourcing UI on the platform. Worked closely with QA.

Software Engineering Intern

June 2019 – Sep. 2019

- **Proof of Concept:** Developed a POC to restructure the current crowdsourcing system for the AI platform. Introduced external and internally-hosted jobs of different types with full end-to-end integration using MTurk.

Center for Healthcare Engineering and Patient Safety

Ann Arbor, MI

Research Assistant, Advisor: Prof. Amy Cohn

May 2018 – May 2019

- **Full-Stack Development:** Developed a full-stack web application for administrators at the Central Sterile Processing Department at Michigan Medicine to improve management of services, sets, and surgical instruments.
- **Linear Programming:** Redesigned a linear programming model in C++ to optimize residency scheduling for the Dermatology Department at Michigan Medicine.

Department of Biostatistics, University of Michigan

Ann Arbor, MI

Research Assistant, Advisor: Prof. Hui Jiang

Oct. 2017 – Apr. 2018

PROGRAMMING SKILLS

Languages: C/C++, Python, Shell Scripting, JavaScript, Rust, Go

Miscellaneous: Docker, Git, Linux perf, Intel TopLev, PyTorch, TensorFlow, MLPerf, DALI, LLVM