Muhammed Ugur

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EDUCATION

University of Michigan — Ann Arbor, MI
M.S. in Computer Science and Engineering; GPA: 4.00/4.00 — *Sep. 2020 – May 2021*

University of Michigan — Ann Arbor, MI
B.S. in Computer Science with Honors, Minor in Mathematics; GPA: 3.84/4.00 — *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 – Present*

- **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**.
- **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.
- **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.
- **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 datacenter applications.

EXPERIENCE

Clinc 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*

- **Algorithm Analysis**: Analyzed computationally intensive algorithms for differential gene expression on clinical genomics data. Profiled and researched methods to reduce overall runtime in R.
- **Presentation**: Prepared a presentation and poster for the annual University of Michigan UROP symposium.

PROGRAMMING SKILLS

Languages: C/C++, Python, Shell Scripting, JavaScript, Rust, Go
Miscellaneous: Docker, Git, Linux perf, Intel TopLev, PyTorch, TensorFlow, MLPerf, DALI, LLVM