Muhammed Ugur

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Education

Yale University — New Haven, CT
Ph.D. in Computer Science — *Aug. 2022 – Present*
Advisor: *Prof. Abhishek Bhattacharjee*

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

University of Michigan — Ann Arbor, MI
B.S. in Computer Science with Honors, Minor in Mathematics — *Sep. 2016 – May 2020*

Research

Areas: Computer Architecture, Computer Systems, Compilers, Neural Engineering, Signal Processing
Topics: Hardware/Software Co-Design, Neural Interfaces, Accelerators, Datacenter Optimizations

Conference Publications

[1] *SCALO: An Accelerator-Rich Distributed System for Scalable Brain-Computer Interfacing*, Karthik Sriram, Raghavendra Pradyumna Pothukuchi, Michal Gerasimiuk, **Muhammed Ugur**, Oliver Ye, Rajit Manohar, Anurag Khandelwal, and Abhishek Bhattacharjee, In Proceedings of the 50th International Symposium on Computer Architecture (ISCA 2023)
Best Paper Award Winner

[2] *Whisper: Profile-Guided Branch Misprediction Elimination for Data Center Applications*, Tanvir Ahmed Khan, **Muhammed Ugur**, Krishnendra Nathella, Dam Sunwoo, Heiner Litz, Daniel A Jiménez, and Baris Kasikci, In Proceedings of the 55th International Symposium on Microarchitecture (MICRO 2022)
Best Paper Award Winner

Journal Publications

[1] *Distributed Brain-Computer Interfacing with a Networked Multi-Accelerator Architecture*, Karthik Sriram, Raghavendra Pradyumna Pothukuchi, Michal Gerasimiuk, **Muhammed Ugur**, Rajit Manohar, Anurag Khandelwal, and Abhishek Bhattacharjee, IEEE Micro Magazine, Top Picks in Computer Architecture Issue, July-August 2024
IEEE Micro Top Picks Selection

[2] *One Profile Fits All: Profile-Guided Linux Kernel Optimizations for Data Center Applications*, **Muhammed Ugur**, Cheng Jiang, Alex Erf, Tanvir Ahmed Khan, and Baris Kasikci, ACM SIGOPS Operating Systems Review, Volume 56, Issue 1, pages 26-33, June, 2022 (OSR 2022)

Workshop Publications

[1] *Swapping-Centric Neural Recording Systems*, **Muhammed Ugur**, Raghavendra Pradyumna Pothukuchi, Abhishek Bhattacharjee, The 15th Annual Non-Volatile Memories Workshop (NVMW 2024)

[2] *Understanding Branch Prediction in Data Center Applications*, **Muhammed Ugur**, Tanvir Ahmed Khan, Dam Sunwoo, Krishnendra Nathella, Daniel A. Jiménez, and Baris Kasikci, The Fourth Young Architect Workshop at the 27th ACM International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS 2022)

[3] *Multi-Application Linux Kernel Profile*, **Muhammed Ugur**, Tanvir Ahmed Khan, and Baris Kasikci, The ACM Student Research Competition (SRC) at the 42nd ACM SIGPLAN Conference on Programming Language Design and Implementation (PLDI 2021)

Experience

Department of Computer Science, PhD — New Haven, CT
Graduate Student, Yale University; Advisor: *Prof. Abhishek Bhattacharjee* — *Aug. 2022 – Present*

- **Systems & Architecture**: Building low-power, multi-accelerator systems for invasive brain-computer interfaces
- **Neural Engineering**: Designing chips for on-device processing and storage of large-scale neural recordings. Working with clinicians and researchers at Yale School of Medicine to ensure safety, accuracy, and validity of design.

Computer Science and Engineering — Ann Arbor, MI
Research Assistant, University of Michigan; Advisor: *Prof. Baris Kasikci* — *March 2021 – July 2022*

- **Systems & Architecture**: Optimized the Linux kernel and branch prediction for data center applications
- **Machine Learning Systems**: Profiled popular DL libraries and ML models to determine key bottlenecks

Clinc Inc. — Ann Arbor, MI
Software Engineer — *June 2019 – Feb. 2021*

- **Full-Stack**: Developed new crowdsourcing infrastructure and services for NLP platform

Center for Healthcare Engineering and Patient Safety — Ann Arbor, MI
Research Assistant, University of Michigan; Advisor: *Prof. Amy Cohn* — *May 2018 – May 2019*

- **Full-Stack**: Built web platform to manage surgical instruments for Michigan Medicine

Department of Biostatistics — Ann Arbor, MI
Research Assistant, University of Michigan; Advisor: *Prof. Hui Jiang* — *Oct. 2017 – Apr. 2018*

- **Genomics**: Analyzed costly algorithms for differential gene expression

Awards

- **IEEE Micro 2024 Top Picks Selection**
- **ISCA 2023 Best Paper Award**
- **MICRO 2022 Best Paper Award**
- **Yale Conference Travel Fellowship, '23**
- **Yale University Fellowship, '22-'23**
- **ISCA Student Travel Grant, '23**
- **MICRO Student Travel Grant, '22**
- **ASPLOS Student Travel Grant, '22, '23**

Teaching

- **CPSC 420/520 Computer Architecture** Teaching Assistant, Spring 2024

Programming Skills

Languages: C/C++, Python, Rust, Verilog, High-Level Synthesis, Shell Scripting
Miscellaneous: Docker, Git, Linux perf, Intel TopLev, LLVM