Tersiteab Adem

(734) 596 8373 • teadem@umich.edu • linkedin.com/in/tersiteab
tersiteab

Education

University of Michigan **Sept 2022 – Present 2023**
PhD
Computer Science and Engineering
Related Coursework:

- Advanced Compilers
- MicroArchitecture
- Privacy Enhancing Technologies
- Foundations of Artificial Intelligence

Addis Ababa University **Sept 2015 – Dec 2020 2023**
BSc
Electrical and Computer Engineering, Computer Engineering major
Related Coursework:

- Algorithm Analysis and Design
- Data Structures
- Embedded Systems
- Operating Systems
- Computer Architectures and Organization
- Interfacing and Microcontrollers
- Applied Mathematics I, II, III

Experience

Graduate Student Research Assistant **University of Michigan**
August 2022 – Present

Undergraduate Research Intern **University of Michigan**
June 2021 – Sept 2021

Software Engineer **Tohey Technologies**
March 2021 – July 2022

Data Science Intern **Hamoye**
June 2020 – Dec 2020

Projects

OCTAL - DSL for Data Oblivious Programming **Jan 2023 - Sept 2023**

- This robust language will enable programmers to express their algorithms in a data oblivious way.
- The language will let programmers generate data-oblivious or non-data-oblivious code from a single high-level specification of their algorithm.

Accelerating Inference for Explainable Random Forests **Sept 2022 - Dec 2022**

- Explainable Artificial Intelligence (XAI) has been developed to provide explanations for results obtained from AI models. There is currently a need to improve the performance of XAI models.
- A proposed solution aims to parallelize parts of the XAI algorithm, specifically inference tasks explainable Random Forest, and accelerate it using Process-in-Memory.
- It reduces the large bus traffic associated with this workload by placing comparator nodes in the memory for simple comparisons.

Benchmark Suite for explainable AI **June 2021 - Oct 2021**

- Gathered and curated different explainable AI models that range across both input data domains (images, tabular and data, text) and types of models (Decision Tree, Random Forest, NN).
- Developed metrics to quantitatively measure the performance of explainable AI models
- Tested the performance of SHAP and LIME explanation methods in terms of how faithful the interpretations are to the predictions made by different target models across image, text, and tabular datasets.
- Compiled and organized interpretable ML algorithms with metrics to evaluate them
- Github link: `https://github.com/tersiteab/BeXAI`

Graph application acceleration through optimal vertex placement **June 2021 - Oct 2021**

- Preprocessing techniques to improve the locality
- Identified major bottleneck of graph application that operates on power-law distribution graphs
- Tested different graph reordering techniques to get better performance in terms of execution speed
- Measured the overall speedup obtained when using preprocessed graphs of selected graph applications on baseline platform and OMEGA accelerator
- Github link: `https://github.com/tersiteab/graph-reorder-1`

Profiling Reinforcement Learning algorithm performance **July 2018 - August 2018**

- Used intel V-tune profiler to characterize the performance of RL algorithms, specifically Asynchronous Advantage Action-Critic(A3C) and Deep Deterministic Policy Gradient (DDPG) algorithms on CPU and GPU to identify potential bottlenecks.

Ethiopian Sign Language to Speech Conversion **March 2019 - Dec 2020**

- Aimed to bridge the communication barrier between hearing and speech impaired people and the rest of the community, specifically for Ethiopian sign language users in my country, Ethiopia.
- Designed and built a pair of gloves equipped with flex sensors, gyroscopes, accelerometers, Bluetooth modules, and Arduino microcontroller to capture gestures
- Successfully gathered and processed gesture datasets in the form of electrical signals and trained ML algorithms which are used for sign classification: Random Forest and SVM Classifiers.
- Finally, exported the gesture classification models and used them in a mobile application which is built using Kotlin for real-time translation to speech.
- Github links: `https://github.com/tersiteab/EthSL-to-Speech`

Skills and Tools

Soft Skills

- Creative Problem solving
- Teamwork
- Leadership
- Analytical skills

Programming Languages

- C/C++
- Verilog
- Python
- Java
- Typescript
- MATLAB

Frameworks

- .Net Core
- Angular

Data Science and ML Libraries

- Tensorflow
- PyTorch

Achievements

Very Great Distinction Award **Dec 20202**

- Received for scoring the highest grade from Computer Engineering Major from School of Electrical and Computer department

Very Great Distinction Award **June 2015**

- Received for scoring Highest mark in University entrance exam from City Council

Certificates: **June 2019**

- Machine Learning Course – Coursera
- Deep Learning Specialization – Coursera

Affiliations

- CSE Graduate student organization at U of M, serving as Graduate Student Recruitment Chair
- Semiconductor Research center June 2021 - Present
- Application Driven Architecture (ADA) center June 2021 - Present
- Mechanism Design for Social Good(MD4SG) Oct 2020 - Present
- Ethiopian Electrical Engineers Society Sept 2019 - Present
- Ethiopian Space Science Society Nov 2014 - Present

Community Service

- As the University of Michigan CSEG Student Recruitment Chair, organized the Student Application Support Program(SASP) to assist prospective students in their graduate application process by pairing up them with current PhD students to give them feedback on their application materials
- Participated in tree planting campaigns every year since 2016.
- Peer Mentorship
- Home Tutor: freely tutored high school students from underprivileged backgrounds in STEM subjects, particularly Math and Physics