Biniyam Tiruye

Ph.D. pre-candidate - Computer Science and Engineering, University of Michigan
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Biography

Interested in building the computing systems of tomorrow with security and privacy as core components by exploiting advancements in both software and hardware. Much of my research focuses on designing systems with a robust defense against attacks based on memory access patterns and maintaining the secrecy of private data through algorithm-level modifications to programs.

Education

University of Michigan   *Ann Arbor, MI*
Ph.D in Computer Science and Engineering, GPA: 4.0/4.0   *Sept 2021 - PRESENT*
-    Advisor: Prof. Todd Austin, Concentration: Security & Privacy.

Addis Ababa University   *Addis Ababa, Ethiopia*
BSc in Software Engineering, GPA: 3.85/4.0   *Sept 2015 - Jun 2020*
-    Relevant Coursework: Comp Architecture, Advanced Computer Security,
     Operating Systems, Data Structure, and Algorithm, Robotics, Systems Programming.

Gem5   *Davis, CA*
Gem5 Boot Camp 2022   *Jul 11 - Jul 15, 2022*
-    Gem5 training for junior computer architecture researchers.

10 Academy   *Addis Ababa, Ethiopia*
Data Science Training   *Jul 2020 - Oct 2020*
-    Data science training on data analysis, modeling, and deployment.

Publications

Under Review
1. **Exploring the Efficiency of Data-Oblivious Programs**, IEEE/ACM International Symposium on Code Generation and Optimization (CGO 2023).
   Details the first performance characterization of data-oblivious programs and studies mechanical data-oblivious transformations applied to twenty workloads.

Professional Experience

Center for Application Driving Architecture (ADA)   *Ann Arbor, MI*
Graduate Research Assistant, University of Michigan   *Sept 2021 - PRESENT*

AI.Science
Totonto, Canada
Full-stack web developer
Jan 2021 - Aug 2021

University of Michigan
Ann Arbor, MI
Undergraduate researcher
May 2019 - Aug 2019

Extracurricular Activities

ITSC Inspire
Addis Ababa, Ethiopia
Co-founder & President, Addis Ababa University
Mar 2018 - Mar 2019
- Cofounded ITSC-Inspire, a student-led youth association in Addis Ababa University. I was the president for a year and organized hackathons, seminars, guest talks, and other Events.

Teaching Experience

ITSE-2122 Mobile Programming
Addis Ababa, Ethiopia
Primary Instructor, Addis Ababa University
Sept 2020 - Jan 2021

Research Projects

Data Oblivious Compiler
A C++ compiler that converts native programs into their Data Oblivious versions using Clang source-to-source transformation.

FRAME: Automated Persistent Memory Reverse Engineering Tool
An automated, graphical tool for executing reverse engineering tests on persistent memory modules.

Making Private Computations Faster with Efficient ORAMs
An evaluation of Oblivious RAMs (ORAMs) in the context of Privacy Enhanced Computation.

Skills

Programming: C/C++, Python, Java, Java Script, Bash Script,
Simulations: Gem5
Compiler: LLVM, CLANG
Operating Systems: Linux, Windows, macOS
Web Development: HTML/CSS, ReactJs, NodeJs, GraphQL, SQL, TypeScript
Design: Photoshop, Adobe XD, UI/UX design, Graphic Design
Other: Git, Android