Misiker Tadesse Aga

Research Interests

My research interest is centered around developing techniques and tools that help developers build more secure, reliable, and efficient software. In my PhD thesis, I actively work on developing runtime techniques to provide novel and practical solutions to mitigate advanced code-reuse attacks.

Education

07/2015–Present	**PhD in Computer Science & Engineering**, *University of Michigan*, Ann Arbor, MI.
	Advisor: Todd Austin
	Dissertation Title: Thwarting Advanced Code-reuse Attacks
07/2015–12/2016	**MS in Computer Science & Engineering**, *University of Michigan*, Ann Arbor, MI.
09/2004–07/2008	**BS in Computer Engineering**, *Addis Ababa University*, Addis Ababa, Ethiopia.

Professional Experience

07/2015–Present	**Graduate Student Research Assistant**, *University of Michigan*, Ann Arbor.
	Conduct research in the areas of hardware security, systems security and reliability.

- Developed hardware based solutions to mitigate cold boot attacks and row hammer attacks.
- Developed LLVM and GCC based compilation techniques to mitigate code-reuse attacks.

05/2017–09/2017	**Research Intern**, *Intel Corp.*, Hillsboro, OR.
	Explored techniques and developed solutions for enhanced vulnerability coverage on an in house tool for automated detection of UEFI BIOS security vulnerabilities.
07/2008–08/2012	**Software Developer**, *Information Network Security Agency*, Addis Ababa, Ethiopia.
	Designed, developed, and implemented the web based distributed software solutions in team of more than 50 engineers and code-base of more than 100,000 lines of code.

Teaching Experience

07/2010–07/2015	**Lecturer**, *Addis Ababa University*, Addis Ababa, Ethiopia.
	Taught Computer Engineering courses including Computer Architecture, Data Structures, Algorithm Analysis and Design, Digital Signal Processing and Operating Systems.

Technical Skills

Programming:
C, C++, Python, MATLAB, Verilog, Bash, PHP, Java Script
Hardware/Software/Tools:
Xilinx Vivado, LLVM, Pin Binary Instrumentation

Publications

[1] Mark Gallagher, Lauren Biernacki, Shibo Chen, Zelalem Birhanu Aweke, Salessawi Ferede Yitbarek, **Misiker T. Aga**, Austin Harris, Zhixing Xu, Baris Kasikci, Valeria Bertacco, Sharad Malik, Mohit Tawari, and Todd Austin. Morpheus: A vulnerability-tolerant secure architecture based on ensembles of moving target defenses with churn. In *International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS)*, 2019.

[2] Moritz Lipp, **Misiker T. Aga**, Michael Schwarz, Daniel Gruss, Clémentine Maurice, Lukas Raab, and Lukas Lamster. Nethammer: Inducing rowhammer faults through network requests. *arXiv preprint arXiv:1805.04956*, 2018.

[3] **Misiker T. Aga** and Eneyew Adugna. High performance automatic target recognition. In *AFRICON 2015*. IEEE, 2015.

[4] **Misiker T. Aga** and Todd Austin. Smokestack: thwarting dop attacks with runtime stack layout randomization. In *2019 IEEE/ACM International Symposium on Code Generation and Optimization (CGO)*. IEEE, 2019.

[5] **Misiker T. Aga**, Zelalem Birhanu Aweke, and Todd Austin. When good protections go bad: Exploiting anti-dos measures to accelerate rowhammer attacks. In *2017 IEEE International Symposium on Hardware Oriented Security and Trust (HOST)*. IEEE, 2017.

[6] **Misiker T. Aga**, Colton Holoday, and Todd Austin. Wrangling in the power of code pointers with proxycfi. In *To appear in International Conference on Data and Applications Security and Privacy (DBSec)*, 2019.

[7] Salessawi Ferede Yitbarek, **Misiker T. Aga**, Reetuparna Das, and Todd Austin. Cold boot attacks are still hot: Security analysis of memory scramblers in modern processors. In *2017 IEEE International Symposium on High Performance Computer Architecture (HPCA)*. IEEE, 2017.

Honors & Awards

- Publication [5] nominated for best paper award at HOST 2017.
- Publication [7] won best demo runner up at C-FAR Semi-Annual Workshop 2017.
- Won Turkish International Cooperation Agency (TICA) scholarship for academically outstanding undergraduate students at Addis Ababa University (2006 − 2008).

Professional Activities and Services

- Participated in peer-reviewing papers for: SC–2016, DAC–2016/17/18, DATE–2016/17/18, HOST–2018/19, MICRO–2019
- Research mentoring at Addis Ababa University, Ethiopia (2016–Present)