Misiker Tadesse Aga

Career Interests

My career interest is centered around developing techniques, tools, and runtime environments that enable secure, reliable, and efficient software. In my PhD thesis, I developed efficient program analysis, instrumentation, hardware and runtime support to provide practical solution for mitigating code-reuse attacks.

Education

07/2015–05/2020 **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.

09/2009–07/2011 **MS in Microelectronics Engineering**, *Addis Ababa University*, Addis Ababa, Ethiopia.

09/2004–07/2008 **BS in Computer Engineering**, *Addis Ababa University*, Addis Ababa, Ethiopia.

Trainings

09/2006–07/2008 **CCNA: Routing and Switching**, *Cisco Networking Academy*, Addis Ababa, Ethiopia.

Professional Experience

05/2020–Present **Senior Software Engineer**, *MathWorks, Inc.*, Natick, MA.

Develop features and tools for securing multi-domain systems. Design secure cloud microservices and cloud infrastructure.

07/2015–12/2019 **Graduate Student Research Assistant**, *University of Michigan*, Ann Arbor.

Conduct research in the areas of computer architecture and security.

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

05/2017–09/2017 **Research Intern**, *Intel Corp.*, Hillsboro, OR.

Explored techniques 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.

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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 Algorithm Analyses.

Technical Skills

Programming:
C, C++, Python, MATLAB, Verilog, Bash, PHP, Java Script
Hardware/Software/Tools:
Xilinx Vivado, LLVM, gem5, RISC-V Spike, 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. *EuroS&PW*, 2020.

[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 *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 Workshop 2017.
- Turkish International Cooperation Agency scholarship, AAU (2006 – 2008).

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