Aravind Machiry

Affiliation Ph.D. Candidate in Computer Security, University of California Santa Barbara

Contact Information
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Research Interests My research focuses on various aspects of system security, such as vulnerability detection, mobile security, trusted execution environments, static and dynamic analysis of source code, and binaries. I am also interested in developing novel static/dynamic program analysis techniques for system security problems. My research resulted in various Open-source security tools and several Common Vulnerability Exposures (CVEs) in critical system software such as kernel drivers and bootloaders.

Positions & Education

Ph.D in Computer Science 2014-2020 (Expected)
University of California, Santa Barbara, USA
Advisors: Giovanni Vigna, and Christopher Kruegel
Thesis: Securing smart devices from the bottom-up
Supported by:
Symantec Research Labs Graduate Fellowship
UCSB Graduate Division Dissertation Fellowship

Visiting Researcher Jul 2019-Sep 2019
University of Maryland, College Park, USA
Advisor: Micheal Hicks
Project: Automatically converting legacy code to Checked C

Research Intern Jul 2018-Sep 2018
Symantec Research Labs (SRL), LA, USA
Advisor: Daniel Marino
Project: Interactive static vulnerability detection

Graduate Research Assistant Sep 2014-Present
University of California, Santa Barbara, USA
Advisors: Giovanni Vigna, and Christopher Kruegel

Software Security Engineer 2013-2014
Qualcomm, R&D, USA
Project: Static type checkers to find multiple address space vulnerabilities

M.S in Information Security 2011-2013
Georgia Institute of Technology, Atlanta, USA
Advisor: Mayur Naik
Thesis: Dynodroid: Automated testing of Smartphone Apps

Honors & Awards

- **CSAW Applied Research** Finalist for DIFUZE — CSAW 2017
- **Internet Defense Prize** Runner up for DR.CHECKER — USENIX Security 2017
- **Distinguished Paper Award** for Ramblr — NDSS 2017
- **Best Paper Award Award** for CLAPP — Grad Workshop 2016
- **Distinguished Artifact Award** for Dynodroid — FSE 2013
- **College of Computing MS Research award** — 2013

Publications

[21] **Aravind Machiry**, N. Redini, E. Cammellini, C. Kruegel and G. Vigna. "SPIDER: Enabling Fast Patch Propagation in Related Software Repositories." *Proceedings of the 41st IEEE Symposium on Security and Privacy (**S&P**)*, **2020**

[20] N. Redini, **Aravind Machiry**, R. Wang, C. Spensky, A. Continella Y. Shoshitaishvili, C. Kruegel and G. Vigna. "KARONTE: Detecting Insecure Multi-binary Interactions in Embedded Firmware." *Proceedings of the 41st IEEE Symposium on Security and Privacy (**S&P**)*, **2020**

[19] **Aravind Machiry**, H. Touma, R. Chen, M. Hicks. "(POSTER) Automated conversion of legacy code to Checked C." *Proceedings of the IEEE Secure Development Conference (**SecDev**)*, **2019**

[18] E. Gustafson, M. Muench, C. Spensky, N. Redini, **Aravind Machiry**, Y. Fratantonio, D. Balzarotti, A. Francillon, Y. E. Choe, C. Kruegel, G. Vigna. "Toward the Analysis of Embedded Firmware through Automated Re-hosting." *Proceedings of the 22nd International Symposium on Research in Attacks, Intrusions and Defenses (**RAID**)*, **2019**

[17] N. Redini, R. Wang, **Aravind Machiry**, Y. Shoshitaishvili, C. Kruegel and G. Vigna. "BinTrimmer: Towards Static Binary Debloating Through Abstract Interpretation." *Proceedings of the 16th International Conference on Detection of Intrusions and Malware, and Vulnerability Assessment (**DIMVA**)*, **2019**

[16] **Aravind Machiry**, N. Redini, E. Gustafson, H. Aghakhani, C. Kruegel and G. Vigna. "Detecting Deceptive Reviews using Generative Adversarial Networks." *Proceedings of the 2nd Binary Analysis Research Workshop (**BAR**)*, **2019**.

[15] **Aravind Machiry**, N. Redini, E. Gustafson, Y. Fratantonio, Y. E. Choe, C. Kruegel and G. Vigna. "Using Loops For Malware Classification Resilient to Feature-unaware Perturbations." *Proceedings of the 34th Annual Application Security Application Conference (**ACSAC**)*, **2018**

[14] H. Aghakhani, **Aravind Machiry**, S. Nilizadeh, C. Kruegel and G. Vigna. "Detecting Deceptive Reviews using Generative Adversarial Networks." *Proceedings of the 1st Deep Learning and Security Workshop (**DLS**)*, **2018**.

[13] A. Bianchi, Y. Fratantonio, **Aravind Machiry**, C. Kruegel, G. Vigna, S. Chung, W. Lee. "Broken Fingers: On the Usage of the Fingerprint API in Android." *Proceedings of the ISOC Network and Distributed System Security Symposium (**NDSS**)*, **2018**.

[12] A. Bianchi, K. Borgolte, J. Corbetta, F. Disperati, A. Dutcher, J. Grosen, P. Grosen, **Aravind Machiry**, C. Salls, N. Stephens, G. Vigna, R. Wang (Authors listed alphabetically). "Mechanical Phish: Resilient Autonomous Hacking." *IEEE Security & Privacy Magazine - **SPSI: Hacking without Humans 2018***.

[11] N. Redini, **Aravind Machiry**, D. Das, Y. Fratantonio, A. Bianchi, E. Gustafson, Y. Shoshitaishvili, C. Kruegel, G. Vigna. "BootStomp: On the Security of Bootloaders in Mobile Devices." *Chaos Communication Congress (**34C3**)*, **2017**.

[10] J. Corina, **Aravind Machiry**, C. Salls, Y. Shoshitaishvili, Shuang Hao, C. Kruegel, and G. Vigna. "DIFUZZING Android Kernel Drivers." *Black Hat Europe London, UK December (**BH EU**)*, **2017**.

[9] J. Corina, **Aravind Machiry**, C. Salls, Y. Shoshitaishvili, Shuang Hao, C. Kruegel, and G. Vigna. "DIFUZE: Interface Aware Fuzzing for Kernel Drivers." *Proceedings of the 24th ACM Conference on Computer and Communications Security (**CCS**)*, **2017**. Finalist for **CSAW Applied Research Competition**.

[8] **Aravind Machiry**, C. Spensky, J. Corina, N. Stephens, C. Kruegel, G. Vigna. "DR.CHECKER: A Soundy Analysis for Linux Kernel Drivers." *Proceedings of the 26th USENIX Security Symposium (**USENIX Security**)*, **2017**. Runner up for **Facebook Internet Defense Prize**

[7] N. Redini, **Aravind Machiry**, D. Das, Y. Fratantonio, A. Bianchi, E. Gustafson, Y. Shoshitaishvili, C. Kruegel, G. Vigna. "BootStomp: On the Security of Bootloaders in Mobile Devices." *Proceedings of the 26th USENIX Security Symposium (**USENIX Security**)*, **2017**.

[6] **Aravind Machiry**, E. Gustafson, C. Spensky, C. Salls, N. D. Stephens, R. Wang, A. Bianchi, Y. E. Choe, C. Kruegel, G. Vigna. "BOOMERANG: Exploiting the Semantic Gap in Trusted Execution Environments." *Proceedings of the ISOC Network and Distributed System Security Symposium (**NDSS**)*, **2017**.

[5] R. Wang, Y. Shoshitaishvili, A. Bianchi, **Aravind Machiry**, J. Grosen, P. Grosen, C. Kruegel, G. Vigna. "Ramblr: Making Reassembly Great Again." *Proceedings of the ISOC Network and Distributed System Security Symposium (**NDSS**)*, **2017**. Won **Distinguished Paper Award**.

[4] A. Bianchi, K. Borgolte, J. Corbetta, F. Disperati, A. Dutcher, J. Grosen, P. Grosen, **Aravind Machiry**, C. Salls, N. Stephens, G. Vigna, R. Wang (Authors listed alphabetically). "Cyber Grand Shellphish." ***Phrack***, **2017**.

[3] Y. Fratantonio, **Aravind Machiry**, A. Bianchi, C. Kruegel, G. Vigna. "CLAPP: Characterizing Loops in Android Applications." *Proceedings of the ACM Symposium on Foundations of Software Engineering (**FSE**)*, **2015**.

[2] Y. Fratantonio, **Aravind Machiry**, A. Bianchi, C. Kruegel, G. Vigna. "CLAPP: Characterizing Loops in Android Applications (Invited Talk)." *Proceedings of the International Workshop on Software Development Lifecycle for Mobile (**DeMobile**)*, **2015**.

[1] **Aravind Machiry**, R. Tahiliani, M. Naik. "Dynodroid: An Input Generation System for Android Apps." *Proceedings of the ACM Symposium on Foundations of Software Engineering (**FSE**)*, **2013**. Won **Distinguished Artifact Award**.

Talks

- Unleashing D on Android Kernel Drivers — Nullcon 2018
- Piston: Uncooperative Remote Runtime Patching — ACSAC 2018
- Cyber Grand Shellphish — DEFCON, USA, 2016
- Million Dollar Baby: Towards ANGRly conquering DARPA CGC — Nullcon 2016

Professional Activities

Conferences

- Reviewer — BAR, NDSS 2018
- Program Committee Member, Shadow PC — S&P 2018
- External Reviewer — USENIX 2017
- External Reviewer — NDSS 2016

Journals

- Reviewer, Artificial Intelligence Review — 2018
- Reviewer, Journal of Information Security and Applications — 2018
- Reviewer, Journal of Information and Software Technology — 2017

Teaching

Teaching Assistant, CS8 - Introduction to Computer Science — Summer 2018

References

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Giovanni Vigna
Professor at University of California, Santa Barbara
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Mayur Naik
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Antonio Bianchi
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Yan Shoshitaishvili
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