





# Aravind Machiry

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AFFILIATION	Ph.D. Candidate in Computer Security, University of California Santa Barbara		
CONTACT INFORMATION	University of California, Santa Barbara Department of Computer Science 2104 Harold Frank Hall Santa Barbara, CA 93106-5110 United States of America	<a href="mailto:machiry@cs.ucsb.edu">machiry@cs.ucsb.edu</a>  <a href="https://machiry.github.io">machiry.github.io</a>  <a href="#">machiry</a>  <a href="#">Google Scholar</a> 	
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 <b>Open-source security tools</b> and several <b>Common Vulnerability Exposures (CVEs)</b> in critical system software such as kernel drivers and bootloaders.		
POSITIONS & EDUCATION	<b>Ph.D in Computer Science</b> University of California, Santa Barbara, USA Advisors: Giovanni Vigna, and Christopher Kruegel <b>Thesis: Securing smart devices from the bottom-up</b> Supported by: <b>Symantec Research Labs Graduate Fellowship</b> <b>UCSB Graduate Division Dissertation Fellowship</b>	2014-2020 (Expected)	
	<b>Visiting Researcher</b> University of Maryland, College Park, USA Advisor: Micheal Hicks <b>Project: Automatically converting legacy code to Checked C</b>	Jul 2019-Sep 2019	
	<b>Research Intern</b> Symantec Research Labs (SRL), LA, USA Advisor: Daniel Marino <b>Project: Interactive static vulnerability detection</b>	Jul 2018-Sep 2018	
	<b>Graduate Research Assistant</b> University of California, Santa Barbara, USA Advisors: Giovanni Vigna, and Christopher Kruegel	Sep 2014-Present	
	<b>Software Security Engineer</b> Qualcomm, R&D, USA <b>Project: Static type checkers to find multiple address space vulnerabilities</b>	2013-2014	
	<b>M.S in Information Security</b> Georgia Institute of Technology, Atlanta, USA Advisor: Mayur Naik <b>Thesis: Dynodroid: Automated testing of Smartphone Apps</b>	2011-2013	
HONORS & AWARDS	<ul style="list-style-type: none"><li>• <b>CSAW Applied Research</b> Finalist for DIFUZE CSAW 2017</li><li>• <b>Internet Defense Prize</b> Runner up for DR.CHECKER USENIX Security 2017</li><li>• <b>Distinguished Paper Award</b> for Ramblr NDSS 2017</li><li>• <b>Best Paper Award</b> for CLAPP Grad Workshop 2016</li><li>• <b>Distinguished Artifact Award</b> for Dynodroid FSE 2013</li><li>• <b>College of Computing MS Research award</b> 2013</li></ul>		
PUBLICATIONS	[23] C. Salls, <b>Aravind Machiry</b> , A. Doupe, Y. Shoshitaishvili, C. Kruegel, and G. Vigna. “Exploring Abstraction Functions in Fuzzing.” <i>Proceedings of the 2020 IEEE Conference on Communications and Network Security (CNS)</i> , 2020		

- [22] C. Spensky, **Aravind Machiry**, M. Busch, K. Leach, R. Housley, C. Kruegel, and G. Vigna. "TRUST.IO: Protecting Physical Interfaces on Cyber-physical Systems." *Proceedings of the 2020 IEEE Conference on Communications and Network Security (CNS)*, 2020
- [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. Nilzadeh, 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. "DI-FUZZING 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. "DI-FUZE: 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	<b>Conferences</b>	
	• Reviewer	BAR, NDSS 2018
	• Program Committee Member, Shadow PC	S&P 2018
	• External Reviewer	USENIX 2017
	• External Reviewer	NDSS 2016
	<b>Journals</b>	
	• 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
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REFERENCES	<b>Christopher Kruegel</b>	
	Professor at University of California, Santa Barbara	<b>Giovanni Vigna</b>
	<a href="mailto:chris@cs.ucsb.edu">chris@cs.ucsb.edu</a> ✉	Professor at University of California, Santa Barbara
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