Yanick Fratantonio

Assistant Professor

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Research Interests

My research interests span the areas of systems and software security, specifically focusing on *mobile systems security and privacy*. My research aims at developing novel program analysis techniques to characterize and identify evasive hard-to-detect malicious code, detecting and preventing high-impact security vulnerabilities, and performing large-scale studies to assess the practicality of novel security mechanisms when deployed in real-world scenarios.

Education

2011-2017	**Ph.D. Student in the Computer Security Lab**, *Computer Science Department*, University of California, Santa Barbara, USA.
supervisors	Professor Christopher Kruegel, Professor Giovanni Vigna
2008-2011	**M.Sc. in Computer Engineering**, *Department of Electronics and Information*, Polytechnic of Milan, Italy. Final grade: 110 *cum laude* out of 110
2009-2011	**M.Sc. in Computer Science**, University of Illinois at Chicago, USA.
2005-2008	**B.Sc. in Computer Engineering**, *Department of Electronics and Information*, Polytechnic of Milan, Italy. Final grade: 110 *cum laude* out of 110

Research Experience

06/2016 - 09/2016	**Research Intern**, *Georgia Tech*, Atlanta, GA.
06/2014 - 09/2014	**Research Intern**, *Microsoft Research*, Redmond, WA.
09/2011 - 08/2017	**Research Assistant**, *UC Santa Barbara*, Santa Barbara, CA.
07/2010 - 10/2010	**Visiting Researcher**, *UC Santa Barbara*, Santa Barbara, CA.

Publications

[1] Aravind Machiry, Nilo Redini, Eric Gustafson, **Yanick Fratantonio**, Yung Ryn Choe, Christopher Kruegel, Giovanni Vigna. Using Loops For Malware Classification Resilient to Feature-unaware Perturbations. In Proceedings of the Annual Computer Security Applications Conference (ACSAC), 2018

[2] Andrea Possemato, Andrea Lanzi, Pak Chung, Wenke Lee, **Yanick Fratantonio**. ClickShield: Are You Hiding Something? Towards Eradicating Clickjacking on Android. In Proceedings of the ACM Conference on Computer and Communications Security (CCS), 2018

[3] Simone Aonzo, Alessio Merlo, Giulio Tavella, **Yanick Fratantonio**. Phishing Attacks on Modern Android. In Proceedings of the ACM Conference on Computer and Communications Security (CCS), 2018

[4] Victor van der Veen, Martina Lindorfer, **Yanick Fratantonio**, Harikrishnan Padmanabha Pillai, Giovanni Vigna, Christopher Kruegel, Herbert Bos, Kaveh Razavi. GuardION: Practical Mitigation of DMA-based Rowhammer Attacks on ARM. In Proceedings of the Conference on Detection of Intrusions and Malware and Vulnerability Assessment (DIMVA), 2018.
Pwnie Award Nomination for Best Privilege Escalation Bug 2018

[5] Emanuele Cozzi, Mariano Graziano, **Yanick Fratantonio**, Davide Balzarotti. Understanding Linux Malware. In Proceedings of the IEEE Symposium on Security and Privacy (S&P), 2018

[6] Antonio Bianchi, **Yanick Fratantonio**, Aravind Machiry, Christopher Kruegel, Giovanni Vigna, Pak Chung, Wenke Lee. Broken Fingers: On the Usage of the Fingerprint API in Android. In Proceedings of the ISOC Network and Distributed System Security Symposium (NDSS), 2018

[7] Antonio Bianchi, Eric Gustafson, **Yanick Fratantonio**, Christopher Kruegel, Giovanni Vigna. Exploitation and Mitigation of Authentication Schemes Based on Device-Public Information. In Proceedings of the Annual Computer Security Applications Conference (ACSAC), 2017

[8] Nilo Redini, Aravind Machiry, Dipanjan Das, **Yanick Fratantonio**, Antonio Bianchi, Eric Gustafson, Yan Shoshitaishvili, Christopher Kruegel, Giovanni Vigna. BootStomp: On the Security of Bootloaders in Mobile Devices. In Proceedings of the USENIX Security Symposium (SEC), 2017

[9] **Yanick Fratantonio**, Chenxiong Qian, Pak Chung, Wenke Lee. Cloak and Dagger: From Two Permissions to Complete Control of the UI Feedback Loop. In Black Hat USA, 2017

[10] **Yanick Fratantonio**, Chenxiong Qian, Pak Chung, Wenke Lee. Cloak and Dagger: From Two Permissions to Complete Control of the UI Feedback Loop. In Proceedings of the IEEE Symposium on Security and Privacy (S&P), 2017.
Distinguished Practical Paper Award at IEEE Security & Privacy 2017

[11] Vasilios Mavroudis, Shuang Hao, **Yanick Fratantonio**, Federico Maggi, Giovanni Vigna, Christopher Kruegel. On the Privacy and Security of the Ultrasound Ecosystem. In Proceedings of the Privacy Enhancing Technologies Symposium (PETS), 2017

[12] Andrea Continella, **Yanick Fratantonio**, Martina Lindorfer, Alessandro Puccetti, Ali Zand, Christopher Kruegel, Giovanni Vigna. Obfuscation-Resilient Privacy Leak Detection for Mobile Apps Through Differential Analysis. In Proceedings of the ISOC Network and Distributed System Security Symposium (NDSS), 2017

[13] Vasilios Mavroudis, Shuang Hao, **Yanick Fratantonio**, Federico Maggi, Giovanni Vigna, Christopher Kruegel. Talking Behind Your Back: Attacks and Countermeasures of Ultrasonic Cross-device Tracking. In Black Hat Europe, 2016

[14] Victor van der Veen, **Yanick Fratantonio**, Martina Lindorfer, Daniel Gruss, Clementine Maurice, Giovanni Vigna, Herbert Bos, Kaveh Razavi, Cristiano Giuffrida. Drammer: Deterministic Rowhammer Attacks on Mobile Platforms. In Proceedings of the ACM Conference on Computer and Communications Security (CCS), 2016.
Pwnie Award for Best Privilege Escalation Bug 2017 and CSAW Applied Research Best Paper Award

[15] **Yanick Fratantonio**, Antonio Bianchi, William Robertson, Engin Kirda, Christopher Kruegel, Giovanni Vigna. TriggerScope: Towards Detecting Logic Bombs in Android Apps. In Proceedings of the IEEE Symposium on Security and Privacy (S&P), 2016

[16] Weidong Cui, Marcus Peinado, Sang Kil Cha, **Yanick Fratantonio**, Vasileios Kemerlis. RETracer: Triaging Crashes by Reverse Execution from Partial Memory Dumps. In Proceedings of the International Conference on Software Engineering (ICSE), 2016

[17] Vitor Afonso, Antonio Bianchi, **Yanick Fratantonio**, Adam Doupe, Mario Polino, Paulo de Geus, Christopher Kruegel, Giovanni Vigna. Going Native: Using a Large-Scale Analysis of Android Apps to Create a Practical Native-Code Sandboxing Policy. In Proceedings of the ISOC Network and Distributed System Security Symposium (NDSS), 2016

[18] Luca Falsina, **Yanick Fratantonio**, Stefano Zanero, Christopher Kruegel, Giovanni Vigna, Federico Maggi. Grab'n Run: Secure and Practical Dynamic Code Loading for Android Applications. In Proceedings of the Annual Computer Security Applications Conference (ACSAC), 2015

[19] Simone Mutti, **Yanick Fratantonio**, Antonio Bianchi, Luca Invernizzi, Jacopo Corbetta, Dhilung Kirat, Christopher Kruegel, Giovanni Vigna. BareDroid: Large-Scale Analysis of Android Apps on Real Devices. In Proceedings of the Annual Computer Security Applications Conference (ACSAC), 2015

[20] Antonio Bianchi, **Yanick Fratantonio**, Christopher Kruegel, Giovanni Vigna. NJAS: Sandboxing Unmodified Applications in non-rooted Devices Running Stock Android. In Proceedings of the ACM Workshop on Security and Privacy in Smartphones and Mobile Devices (SPSM), 2015

[21] **Yanick Fratantonio**, Aravind Machiry, Antonio Bianchi, Christopher Kruegel, Giovanni Vigna. CLAPP: Characterizing Loops in Android Applications. In Proceedings of the ACM Symposium on the Foundations of Software Engineering (FSE), 2015.
Best Paper Award at the UCSB Graduate Student Workshop on Computing 2016

[22] **Yanick Fratantonio**, Aravind Machiry, Antonio Bianchi, Christopher Kruegel, Giovanni Vigna. CLAPP: Characterizing Loops in Android Applications (Invited Talk). In Proceedings of International Workshop on Software Development Lifecycle for Mobile (DeMobile), 2015

[23] **Yanick Fratantonio**, Antonio Bianchi, William Robertson, Manuel Egele, Christopher Kruegel, Engin Kirda, Giovanni Vigna. On the Security and Engineering Implications of Finer-Grained Access Controls for Android Developers and Users. In Proceedings of the Conference on Detection of Intrusions and Malware and Vulnerability Assessment (DIMVA), 2015

[24] Antonio Bianchi, Jacopo Corbetta, Luca Invernizzi, **Yanick Fratantonio**, Christopher Kruegel, Giovanni Vigna. What the App is That? Deception and Countermeasures in the Android User Interface. In Proceedings of the IEEE Symposium on Security and Privacy (S&P), 2015

[25] Yinzhi Cao, **Yanick Fratantonio**, Antonio Bianchi, Manuel Egele, Christopher Kruegel, Giovanni Vigna, Yan Chen. EdgeMiner: Automatically Detecting Implicit Control Flow Transitions through the Android Framework. In Proceedings of the ISOC Network and Distributed System Security Symposium (NDSS), 2015

[26] Martina Lindorfer, Matthias Neugschwandtner, Lukas Weichselbaum, **Yanick Fratantonio**, Victor van der Veen, Christian Platzer. Andrubis - 1,000,000 Apps Later: A View on Current Android Malware Behaviors. In Proceedings of the International Workshop on Building Analysis Datasets and Gathering Experience Returns for Security (BADGERS), 2014

[27] Giovanni Vigna, Kevin Borgolte, Jacopo Corbetta, Adam Doupe, **Yanick Fratantonio**, Luca Invernizzi, Dhilung Kirat, Yan Shoshitaishvili. Ten Years of iCTF: The Good, The Bad, and The Ugly. In Proceedings of the USENIX Summit on Gaming, Games, and Gamification in Security Education (3GSE), 2014

[28] Lukas Weichselbaum, Matthias Neugschwandtner, Martina Lindorfer, **Yanick Fratantonio**, Victor van der Veen, Christian Platzer. Andrubis: Android Malware Under The Magnifying Glass. In Technical Report TR-ISECLAB-0414-001, 2014

[29] Sebastian Poeplau, **Yanick Fratantonio**, Antonio Bianchi, Christopher Kruegel, Giovanni Vigna. Execute This! Analyzing Unsafe and Malicious Dynamic Code Loading in Android Applications. In Proceedings of the ISOC Network and Distributed System Security Symposium (NDSS), 2014

[30] Manuel Egele, David Brumley, **Yanick Fratantonio**, Christopher Kruegel. An Empirical Study of Cryptographic Misuse in Android Applications. In Proceedings of the ACM Conference on Computer and Communications Security (CCS), 2013

[31] **Yanick Fratantonio**, Christopher Kruegel, Giovanni Vigna. Shellzer: A Tool for the Dynamic Analysis of Malicious Shellcode. In Proceedings of the Symposium on Recent Advances in Intrusion Detection (RAID), 2011

Awards

- Pwnie Award for Best Privilege Escalation Bug, 2017
- Distinguished Practical Paper Award, IEEE Security & Privacy, 2017
- Best Paper Award at the Graduate Student Workshop on Computing, UC Santa Barbara, 2016
- Outstanding Student Award in Computer Science, UC Santa Barbara, 2015
- Best Reviewer Award for the Graduate Student Workshop on Computing (GSWC) 2013
- Best Reviewer Award for the Graduate Student Workshop on Computing (GSWC) 2012
- Student Travel Grant for USENIX Security 2013, IEEE S&P 2013, CCS 2015

University Service

2015	**Organizer of the first CS Student Research Colloquium**, *UC Santa Barbara*.
2013	**Judge for assigning the UCSB Senior Captsone $1000 Best Presentation Award**, *UC Santa Barbara*.
2013-2014	**Graduate Student Representative**, *Computer Science Department, UC Santa Barbara*.

2012-2015   **Program Committee Member of the Graduate Student Workshop on Computing (GSWC)**, *UC Santa Barbara*.

Professional Activities

TPC Member, *Annual Computer Security Applications Conference (ACSAC), 2018*.

TPC Member, *USENIX Workshop on Offensive Technologies (WOOT), 2018*.

TPC Member, *International Conference on Network and System Security (NSS), 2018*.

TPC Member, *Conference on Detection of Intrusions and Malware & Vulnerability Assessment (DIMVA), 2018*.

TPC Member, *International Conference on Distributed Computing Systems (ICDCS), 2018*.

TPC Member, *International Symposium on Engineering Secure Software and Systems (ESSoS), 2018*.

TPC Member, *USENIX Enigma, 2017*.

TPC Member, *European Workshop on Systems Security (EuroSec), 2018*.

TPC Member, *International Conference on Advances and Trends in Software Engineering (SOFTENG), 2018*.

TPC Member, *International Conference on Internet Monitoring and Protection (ICIMP), 2018*.

TPC Member, *ACM Workshop on Malicious Software and Hardware in Internet of Things (MALIOT), 2017, 2018*.

TPC Member, *Tyrrhenian International Workshop on Digital Communications (TIWDC), 2017*.

Associate Editor, *IET Information Security Journal*.

Reviewer, *IEEE Security & Privacy Journal*.

Reviewer, *Transactions on Computers (TCSI)*.

Reviewer, *Computers & Security (COSE)*.

Reviewer, *ACM Transactions on Privacy and Security (TOPS)*.

Reviewer, *IEEE Transactions on Mobile Computing (TMC)*.

Reviewer, *IEEE Transactions on Dependable and Secure Computing (TDSC)*.

Reviewer, *Transactions on Information Forensic and Security (TIFS)*.

Reviewer, *Transactions on Emerging Topics in Computing (TETCSI)*.

Reviewer, *Journal of Information Security and Applications (JISA)*.

Reviewer, *IET Information Security Journal*.

Reviewer, *Future Generation Computer Systems Journal (FGCS)*.

External Reviewer, *World Wide Web Conference (WWW), 2018*.

External Reviewer, *Symposium on Network and Distributed System Security (NDSS), 2015, 2016*.

External Reviewer, *ACM Conference on Computer and Communications Security (CCS), 2014*.

External Reviewer, *USENIX Security Symposium, 2014, 2015, 2016, 2017*.

External Reviewer, *IEEE Symposium on Security and Privacy (S&P), 2013*.

TPC Member, *USENIX Security Symposium Shadow PC, 2014*.

TPC Member, *The Graduate Student Workshop on Computing (GSWC), 2013, 2014, 2015*.

External Reviewer, *The Graduate Student Workshop on Computing (GSWC), 2012*.

Teaching Experience

2015   **Guest Lecture on "Android Hacking" at CS279 Advanced Topics in Computer Security**, *UC Santa Barbara*, Santa Barbara, CA.

2015   **Guest Lecture at CS595 seminar titled "Introduction to Graduate School in Computer Science"**, *UC Santa Barbara*, Santa Barbara, CA.

2011-2015   **International Capture the Flag (iCTF) — Organizer**, *UC Santa Barbara*, Santa Barbara, CA.
Participated in the organization of one of the world's largest educational hacking competition

Talks

05/2018   **Betrayed by the Android UI: Why UI security matters (Invited Talk)**, *Google*, Mountain View, CA.

10/2017   **Cloak and Dagger: Why Boring UI Bugs Matter (Invited Talk)**, *MST Workshop, Politecnico di Milano*, Milan, Italy.

10/2017   **Cloak and Dagger: From Two Permissions to Complete Control of the UI Feedback Loop (Invited Talk)**, *With The Best*.

10/2017   **Cloak and Dagger: From Two Permissions to Complete Control of the UI Feedback Loop (Invited Talk)**, *ISACA Venice*, Venice, Italy.

07/2017   **Cloak and Dagger: From Two Permissions to Complete Control of the UI Feedback Loop**, *Black Hat USA*, Las Vegas, NV.

07/2017   **Cloak and Dagger: From Two Permissions to Complete Control of the UI Feedback Loop (Invited Talk)**, *Flame Wars @ Tinder*, San Francisco, CA.

06/2017   **Research Seminar: Securing Mobile Devices from Evasive Malware**, *USI Lugano*, Lugano, Switzerland.

05/2017   **Cloak and Dagger: From Two Permissions to Complete Control of the UI Feedback Loop**, *IEEE Symposium on Security & Privacy (S&P)*, San Jose, CA.

04/2017   **Cloak and Dagger: From Two Permissions to Complete Control of the UI Feedback Loop (Invited Talk)**, *Georgia Tech Cybersecurity Series*, Atlanta, GA.

05/2016   **TriggerScope: Towards Detecting Logic Bombs in Android Apps**, *IEEE Symposium on Security & Privacy (S&P)*, San Jose, CA.

03/2016   **CLAPP: Characterizing Loops in Android Applications**, *UCSB Graduate Student Workshop on Computing (GSWC)*, Santa Barbara, CA.

09/2015   **CLAPP: Characterizing Loops in Android Applications**, *ACM Symposium on the Foundations of Software Engineering (FSE)*, Bergamo, Italy.

08/2015   **CLAPP: Characterizing Loops in Android Applications (Invited Talk)**, *International Workshop on Software Development Lifecycle for Mobile (DeMobile)*, Bergamo, Italy.

07/2015   **On the Security and Engineering Implications of Finer-Grained Access Controls for Android Developers and Users**, *Conference on Detection of Intrusions and Malware and Vulnerability Assessment (DIMVA)*, Milan, Italy.

09/2014   **End-of-Internship Talk**, *Microsoft Research*, Redmond, WA.

05/2014	**Security Threats on Mobile: What You & App Developers Can Do About It (Invited Talk)**, *Mobile Santa Barbara Meetup*, Santa Barbara, CA.
01/2014	**EdgeMiner: Automatically Detecting Implicit Control Flow Transitions through the Android Framework**, *DARPA APAC PI Meeting*, San Diego, CA.
07/2013	**ShellNoob: a shellcode writing toolkit**, *Black Hat USA Arsenal 2013*, Las Vegas, NV.
10/2012	**Shellzer: a tool for the dynamic analysis of malicious shellcode**, *UCSB Graduate Student Workshop on Computing (GSWC)*, Santa Barbara, CA.
09/2011	**Shellzer: a tool for the dynamic analysis of malicious shellcode**, *Symposium on Recent Advances in Intrusion Detection (RAID)*, Menlo Park, CA.

Languages

| Mother tongue | Italian |
| Other languages | English (Full professional proficiency) |

Media Coverage

- TechCrunch: Cloak & Dagger is a newly-discovered Android exploit that lets hackers hide malicious activity
- Mashable: A new Android attack with a cool name can wreak havoc on your phone
- The Hacker News: All Android Phones Vulnerable to Extremely Dangerous Full Device Takeover Attack
- WIRED: How to Block the Ultrasonic Signals You Didn't Know Were Tracking You
- Fortune: Inaudible Soundwaves Expose a Spooky New Pathway for Hackers
- SlashDot: Serious Hacks Possible Through Inaudible Ultrasound
- Schneier on Security: Hardware Bit-Flipping Attacks in Practice
- Ars Technica: Using Rowhammer bitflips to root Android phones is now a thing
- WIRED: Elegant Physics (and Some Down and Dirty Linux Tricks) Threaten Android Phones
- SlashDot: Rowhammer Attack Can Now Root Android Devices

Hacking Competitions

- Member of the Order Of the Overflow (OOO) team, the current DEFCON CTF organizers
- Academic Advisor of EURECOM's NOPS hacking team
- Member of the Shellphish hacking group (one of the top-ten hacking teams worldwide)
- Member of the organization team of the iCTF 2011 - 2016

Artistic Skills

- I have played the piano for eight years
- I have been playing the guitar for ten years

References

Giovanni Vigna
Department of Computer Science
University of California, Santa Barbara
Santa Barbara, CA 93106
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Christopher Kruegel
Department of Computer Science
University of California, Santa Barbara
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