Andrés Sánchez Marín

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PROFESSIONAL EXPERIENCE

HexHive group, EPFL — Lausanne, Switzerland
Research Assistant — **Sep 2019 – present**
Automating the detection of Speculative ROP chains. Software analysis of side-channel attacks explotaition

IBM Research — Zürich, Switzerland
Research Assistant — **Jun 2020 – Sep 2020**
Taxonomy of kernel code reuse attacks, KASLR bypasses and mitigations in software and architectural level

Massachusets Institute of Technology — Cambridge, United States
Visiting Researcher — **Jun 2019 – Aug 2019**
Security analysis of compressed cache architectures, demonstration of first data at rest microarchitectural leak

IMDEA Software Institute — Madrid, Spain
Research Intern — **Sep 2018 – Jun 2019**
Reasoning about speculative execution attacks and existing proposals for countermeasures. Automating the detection of speculative information flows in large code-bases

Distributed Systems Laboratory, UPM — Madrid, Spain
Research Intern — **Sep 2017 – Dec 2017**
Integrating an Elastic Complex Event Processing for Static and Streaming Data and a NoSQL distributed database

EDUCATION

École Polytechnique Fédérale de Lausanne — Lausanne, Switzerland
Master of Science in Computer Science — **2019 – 2021**

Universidad Politécnica de Madrid — Madrid, Spain
Bachelor of Science in Mathematics and Computing — **2015 – 2019**
Member of ACM UPM chapter
Final Degree Project: Detecting speculative information flows on large code-bases

AREAS OF INTEREST

My main research interest is the development of reliable and optimized software systems, focusing on systems security. Concerning the complete and correct system's specification, and in case of a leaky implementation, to detect how software is able to exploit it, detect the code patterns that perform the exploit and, aim to be secure by circumventing the flaws while keeping its efficiency. All the next topics are of my interest:

Computer Systems	Security	Privacy
Programming Languages & Paradigms	Software Optimizations & Synthesis	Compilers
Algorithms and Data Structures	Hardware Architecture	Operating Systems
Formal Verification	Theoretical Foundations of Computer Science	Quantum computing

OTHER

Languages	**Spanish** (mother tongue), **English** (fluent) – 90 TOEFL iBT, **French** (basic)
Programming	C, Rust, Prolog, Haskell, C++, Assembly, LaTeX, Python, Scala, Lisp
Technologies	Linux, Git, LLVM
Achievements	10 honors in various subjects on Bachelor's degree
Certifications	CCNA 1 & 2, Free Time Monitor Certification
NBA NetAcad Dream Team	In the NBA Global Games (2017, Madrid). Working with Cisco and NBA team on the network infrastructure for the event and helping on its installation.
Volunteer Experience	CIRCA-MAS's Sumac Wasi enhancement project during 2018 summer; recreational and learning activities for a 40 kids group of a marginal Arequipa neigbourhood.

PROCEEDINGS PUBLICATIONS

[1] M. Guarnieri, B. Koepf, J. F. Morales, J. Reineke, and A. Sánchez, "SPECTECTOR: Principled detection of speculative information flows," in *Proceedings of the 41st IEEE Symposium on Security and Privacy*, IEEE, 2020.

[2] P.-A. Tsai, A. Sanchez, C. Fletcher, and D. Sanchez, "Safecracker: Leaking secrets through compressed caches," in *Proceedings of the Twenty-Fifth International Conference on Architectural Support for Programming Languages and Operating Systems*, ASPLOS '20, ACM, 2020.

[3] A. Bhattacharyya, A. Sánchez, E. M. Koruyeh, N. Abu-Ghazaleh, C. Song, and M. Payer, "Specrop: Speculative exploitation of ROP chains," in *23rd International Symposium on Research in Attacks, Intrusions and Defenses (RAID 2020)*, (San Sebastian), pp. 1–16, USENIX Association, Oct. 2020.