

Marco Patrignani, Ph.D.

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Date of Birth: December 2nd, 1986.

Working Experience

2022/3/1 to ... Assistant Professor (RTD-B) at University of Trento (IT)
2018/9/1 to 2022/2/28 Research group leader at CISPA Helmholtz Center for Information Security (DE)
2021/2/1 to 2021/06/30 Visiting lecturer at Stanford University (USA)
2018/9/1 to 2021/01/31 Visiting assistant professor at Stanford University (USA)
2017/9/1 to 2018/8/31 PostDoc researcher at CISPA (DE) (with Michael Backes)
2015/10/1 to 2017/8/31 PostDoc researcher at MPI SWS Saarbrücken (DE) (with Deepak Garg).
2010/11/1 to 2015/09/30 Ph.D. student at KU Leuven (BE) (with Dave Clarke and Frank Piessens).

Education

2010/11 to 2015/09 **Ph.D. in Computer Science** (2015/05/27) at *KU Leuven* (BE).
2008/9 to 2010/7 **Master degree (Laurea specialistica) in Computer Science** at the *University of Bologna* (IT), (110/110 cum laude). (First graduate from the class).
2005/9 to 2008/10 **Bachelor degree (Laurea) in Computer Science.** *University of Bologna* (IT), (107/110).

Achievements & Awards

2022 Distinguished Paper Award at CCS	For: <i>Automatic Detection of Speculative Execution Combinations.</i> (link)
2019 Distinguished Paper Award at CSF	For: <i>Journey beyond full abstraction.</i> (link)
2023 PRIN PNRR (224K€)	AMVDEUS Project (PI)
2023 Mysten Labs (20K€)	Funding for assistants to work on the Move language (PI).
2021 Rita Levi Montalcini (IT) (220K€)	Tenure-track funding at the University of Trento (PI).
2021 Novi/Facebook Grant (50K\$)	To work on robust safety for the Move language (PI).
2017 Cisca-Stanford (DE)	Funding for PostDoc, Assistant professor and Research group leader (6 years total) between CISPA and Stanford.
2011 FWO grant (BE)	Scholarship for a Ph.D. at KU Leuven
2010 LLP Erasmus placement (IT)	EU commission fundings for an internship at KU Leuven.

Publications

Journal papers

1. Dominique Devriese, **Marco Patrignani**, and Frank Piessens. Two parametricities versus three universal types. *ACM Trans. Program. Lang. Syst.*, 44(4), sep 2022
2. Carmine Abate, Roberto Blanco, Adrien Durier, Deepak Garg, Catalin Hritcu, **Marco Patrignani**, Eric Tanter, and Jeremy Thibault. An Extended Account of Trace-Relating Compiler Correctness and Secure Compilation. *ACM Trans. Program. Lang. Syst.*, 43(4), nov 2021
3. **Marco Patrignani** and Deepak Garg. Robustly safe compilation, an efficient form of secure compilation. *ACM Trans. Program. Lang. Syst.*, 43(1), February 2021

4. **Marco Patrignani**, Amal Ahmed, and Dave Clarke. Formal approaches to secure compilation a survey of fully abstract compilation and related work. *ACM Comput. Surv.*, 51(6):125:1–125:36, January 2019
5. Dominique Devriese, **Marco Patrignani**, Frank Piessens, and Steven Keuchel. Modular, Fully-abstract Compilation by Approximate Back-translation. *Logical Methods in Computer Science*, Volume 13, Issue 4, October 2017
6. **Marco Patrignani**, Pieter Agten, Raoul Strackx, Bart Jacobs, Dave Clarke, and Frank Piessens. Secure Compilation to Protected Module Architectures. *ACM Trans. Program. Lang. Syst.*, 37(2):6:1–6:50, April 2015
7. **Marco Patrignani** and Dave Clarke. Fully abstract trace semantics for protected module architectures. *Computer Languages, Systems & Structures*, 42(0):22 – 45, 2015. Special issue on the Programming Languages track at the 29th ACM Symposium on Applied Computing

Conference Papers

1. Robert Künnemann, **Marco Patrignani**, and Ethan Cecchetti. Computational-Bounded Robust Compilation and Universally Composible Security. In *Proceedings of the 37th IEEE Computer Security Foundations Symposium CSF 2024, Enschede, The Netherlands, CSF 2024*, 2024
2. **Marco Patrignani** and Sam Blackshear. Robust Safety for Move. In *Proceedings of the 36th IEEE Computer Security Foundations Symposium CSF 2023, Dubrovnik, Croatia, CSF 2023*, 2023
3. Alexandra Michael, Anitha Gollamudi, Jay Bosamiya, Evan Johnson, Craig Disselkoen, Aidan Denlinger, Conrad Watt, Bryan Parno, **Marco Patrignani**, Marco Vassena, and Deian Stefan. Mswasm: Soundly enforcing memory-safe execution of unsafe code. Number POPL, New York, NY, USA, jan 2023. ACM
4. Xaver Fabian, Marco Guarnieri, and **Marco Patrignani**. Automatic detection of speculative execution combinations. In *Proceedings of the 2022 ACM SIGSAC Conference on Computer and Communications Security, CCS '22, New York, NY, USA, 2022*. ACM. **Distinguished Paper Award**
5. Will Christon, **Marco Patrignani**, Maneesh Agrawala, and Pat Hanrahan. Modular information flow through ownership. In *Proceedings of the 43rd ACM SIGPLAN International Conference on Programming Language Design and Implementation, PLDI 2022*, page 1–14, New York, NY, USA, 2022. ACM
6. **Marco Patrignani** and Marco Guarnieri. Exorcising spectres with secure compilers. In *Proceedings of the 2021 ACM SIGSAC Conference on Computer and Communications Security, CCS '21*, page 445–461, New York, NY, USA, 2021. ACM
7. Akram El-Korashy, Stelios Tsampas, **Marco Patrignani**, Dominique Devriese, Deepak Garg, and Frank Piessens. Capableptrs: Securely compiling partial programs using the pointers-as-capabilities principle. In *34th IEEE Computer Security Foundations Symposium, CSF 2021, Dubrovnik, Croatia, June 21-25, 2021*, pages 1–16. IEEE, 2021
8. **Marco Patrignani**, Eric Martin, and Dominique Devriese. On the semantic expressiveness of recursive types. *Proc. ACM Program. Lang.*, 5(POPL), jan 2021
9. David Durst, Matthew Feldman, Dillon Huff, David Akeley, Ross G. Daly, Gilbert Louis Bernstein, **Marco Patrignani**, Kayvon Fatahalian, and Pat Hanrahan. Type-directed scheduling of streaming accelerators. In *Proceedings of the 41st ACM SIGPLAN International Conference on Programming Language Design and Implementation, PLDI 2020, London, UK, June 15-20, 2020*, pages 408–422, 2020
10. Carmine Abate, Roberto Blanco, Adrien Durier, Deepak Garg, Catalin Hritcu, **Marco Patrignani**, Eric Tanter, and Jeremy Thibault. Trace-relating compiler correctness and secure compilation. In Peter Müller, editor, *Programming Languages and Systems*, pages 1–28, Cham, 2020. Springer

11. Carmine Abate, Roberto Blanco, Deepak Garg, Catalin Hritcu, **Marco Patrignani**, and Jeremy Thibault. Journey Beyond Full Abstraction: Exploring Robust Property Preservation for Secure Compilation. In *Proceedings of the 32th IEEE Computer Security Foundations Symposium CSF 2019, Hoboken, USA, CSF, 2019*. **Distinguished Paper Award**
12. **Marco Patrignani** and Deepak Garg. Robustly safe compilation. In *Programming Languages and Systems - 28th European Symposium on Programming, ESOP 2019, ESOP'19, 2019*
13. Dominique Devriese, **Marco Patrignani**, and Frank Piessens. Parametricity versus the universal type. In *Proceedings of the 45th Annual ACM SIGPLAN-SIGACT Symposium on Principles of Programming Languages, POPL 2018, Los Angeles, CA, USA, 2018*
14. **Marco Patrignani** and Deepak Garg. Secure Compilation and Hyperproperties Preservation. In *Proceedings of the 30th IEEE Computer Security Foundations Symposium CSF 2017, Santa Barbara, USA, CSF 2017, 2017*
15. **Marco Patrignani**, Dominique Devriese, and Frank Piessens. On Modular and Fully-Abstract Compilation. In *Proceedings of the 29th IEEE Computer Security Foundations Symposium CSF 2016, Lisbon, Portugal, CSF 2016, 2016*
16. Dominique Devriese, **Marco Patrignani**, and Frank Piessens. Fully-abstract compilation by approximate back-translation. In *Proceedings of the 43rd Annual ACM SIGPLAN-SIGACT Symposium on Principles of Programming Languages, POPL 2016, St. Petersburg, FL, USA, January 20 - 22, 2016*, pages 164–177, 2016
17. Adriaan Larmuseau, **Marco Patrignani**, and Dave Clarke. Implementing a Secure Abstract Machine. In *Proceedings of the 31th Annual ACM Symposium on Applied Computing, SAC '16. ACM, 2016*
18. Adriaan Larmuseau, **Marco Patrignani**, and Dave Clarke. A secure compiler for ML modules. In *Programming Languages and Systems - 13th Asian Symposium, APLAS 2015, Pohang, South Korea, November 30 - December 2, 2015, Proceedings*, pages 29–48, 2015
19. Adriaan Larmuseau, **Marco Patrignani**, and Dave Clarke. A high-level model for an assembly language attacker by means of reflection. In *Dependable Software Engineering: Theories, Tools, and Applications - First International Symposium, SETTA 2015, Nanjing, China, November 4-6, 2015, Proceedings*, pages 168–182, 2015
20. **Marco Patrignani** and Dave Clarke. Fully Abstract Trace Semantics of Low-level Isolation Mechanisms. In *Proceedings of the 29th Annual ACM Symposium on Applied Computing, SAC '14*, pages 1562–1569. ACM, 2014
21. **Marco Patrignani**, Dave Clarke, and Frank Piessens. Secure Compilation of Object-Oriented Components to Protected Module Architectures. In *Proceedings of the 11th Asian Symposium on Programming Languages and Systems (APLAS'13)*, volume 8301 of LNCS, pages 176–191, 2013
22. **Marco Patrignani**, Dave Clarke, and Davide Sangiorgi. Ownership Types for the Join Calculus. In *FMOODS/FORTE 2011*, volume 6722 of LNCS, pages 289–303, 2011

Theses

1. **Marco Patrignani**. *The Tome of Secure Compilation: Fully Abstract Compilation to Protected Modules Architectures*. PhD thesis, KU Leuven, Leuven, Belgium, May 2015

Professional Activities

Teaching

2022-23 → 23-24	Advanced Programming, Programming Language Semantics (@UniTn)
2021-22 → 23-24	Programmazione 2 (@UniTn)
2021-22 → 22-23	Doctoral course on secure compilation (@UniTn) (+@UniPi 21-22)
2021-22	Formal Methods in Security (IFC part) (@CISPA & UdS)
2018-19 → 20-21	cs358: Programming Language Foundations (@Stanford)
2018-19 → 20-21	cs350: Secure Compilation (@Stanford)
2017-18 → 18-19	Instructor for the seminar on secure compilation (@CISPA & UdS)
2017-18	Topic supervisor on the CISPA joint conference seminar. (@CISPA & UdS)
2011-12 → 14-15	Comparative Programming Languages: TA [plus lectures]; (@ KUL)
2013-14 → 14-15	Problem & solving: TA and organisation. (@ KUL)
2010-11 → 12-13	Fundamentals of Computer Science: TA [plus lectures]. (@ KUL)

Note: P&O is a software development course project equivalent to a Bachelor thesis.

Students (PhD first, then Master, Bachelor, and Interns)

@CISPA @UniTN	Xaver Fabian (since 2021/09), Matthis Kruse (since 2021/10) Andrea Ballarini, Roberto Cornacchiari, Luca Giacometti, Sabin Andone, Andrea Ste-dile, Sacha Bordais-Poulard, Guillaume Massal
@Stanford @CISPA @MPI-SWS @KU Leuven	Koby Chan, Eric Martin, Wilson Nguyen, Nicholas Barbier, Max DiGiacomo Xaver Fabian Maximilian Schwenger (with Deepak Garg), Akram El-Korashy (with Deepak Garg) Matthias van der Hallen, Pieter van Geel

Community Duties

Keynote GTMFS '24

Chair PRISC '25, PRISC '24, FCS '23, FCS '22

PC PRISC '24, CSF '24, SecDev '23, PRISC '23, POPL '23; Aplas '22; SecDev '22; SecDev '21; CCS '21; CSF '20; PRISC '19; SAC '19; PRISC '18; SAC '18; SCM '17; SAC '17; FCS '16; SAC '16; SAC '15; ICCSW '14.

External Reviewer Elsevier JISAS; JFP; CSF '21; POPL '16; CSF '15; Elsevier COMLAN; FOCLASA '14; GPCE '14; SWJ; IFM '13; FSEN '13; ESOP '12; IWACO '11.

Languages

Italian	Mothertongue.
English	Spoken every day and used to write international articles since 2010.
Dutch & German	Elementary proficiency.

Contacts

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