Marco **Guarnieri**

Campus Montegancedo UPM, Pozuelo de Alarcón, 28223, Madrid, Spain

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Education

ETH Zurich   *Zurich, Switzerland*
PhD in Computer Science   *Oct. 2012 - Jan. 2018*

   Advisor: Prof. David Basin

Università degli Studi di Bergamo   *Bergamo, Italy*
Master of Science in Computer Engineering   *Sep. 2010 - Jul. 2012*

   Advisor: Prof. Stefano Paraboschi

Bachelor of Science in Computer Engineering   *Sep. 2007 - Sep. 2010*

   Advisor: Prof. Stefano Paraboschi

Professional Experience

IMDEA Software Institute   *Madrid, Spain*
Assistant Research Professor   *Jun. 2019 - PRESENT*

   Research Areas: Security & Privacy, Information-flow control, Language-based security

Researcher   *Apr. 2019 - May 2019*

   Research Areas: Security & Privacy, Information-flow control, Language-based security

Postdoctoral Researcher   *Jul. 2018 - Apr. 2019*

   Research Areas: Security & Privacy, Information-flow control, Language-based security

ETH Zurich   *Zurich, Switzerland*
Postdoctoral Researcher   *Feb. 2018 - May 2018*

   Research Areas: Security & privacy, Database security, Information-flow control

Research Assistant   *Oct. 2012 - Jan. 2018*

   Research Areas: Computer security, Databases, Access control

Università degli Studi di Bergamo   *Bergamo, Italy*
Research Assistant   *Aug. 2012 - Sep. 2012*

   Research Areas: Access control, Model-driven engineering

SAP Labs France   *Sophia Antipolis, France*
R&D Intern   *Jun. 2010 - Sep. 2010*

   Research Areas: Security, Static analysis

Conference and Workshop Publications

2020

   Pepe Vila, Pierre Ganty, **Marco Guarnieri**, Boris Köpf
   CacheQuery: Learning Replacement Policies from Hardware Caches
   In: *41st ACM SIGPLAN Conference on Programming Language Design and Implementation (PLDI 2020)*

2019

   Marco Guarnieri, Boris Köpf, José F. Morales, Jan Reineke, Andrés Sánchez
   Spectector: Principled Detection of Speculative Information Flows
   In: *41st IEEE Symposium on Security and Privacy (S&P 2020)*

   Marco Guarnieri, Musard Balliu, Daniel Schoepe, David Basin, Andrei Sabelfeld
   Information-Flow Control for Database-backed Applications
   In: *4th IEEE European Symposium on Security and Privacy (EuroS&P 2019)*

2017

Marco Guarnieri, Srdjan Marinovic, and David Basin
Securing Databases from Probabilistic Inference
In: *30th IEEE Computer Security Foundations Symposium (CSF 2017)*

Marco Guarnieri, Petar Tsankov, Tristan Buchs, Mohammad Torabi Dashti, and David Basin
Test Execution Checkpointing for Web Applications
In: *26th ACM SIGSOFT International Symposium on Software Testing and Analysis (ISSTA 2017)*

Martin Kucera, Petar Tsankov, Timon Gehr, **Marco Guarnieri**, and Martin Vechev
Synthesis of Permissive Privacy Enforcement
In: *24th ACM Conference on Computer and Communications Security (CCS 2017)*

2016

Marco Guarnieri, Srdjan Marinovic, and David Basin
Strong and Provably Secure Database Access Control
In: *1st IEEE European Symposium on Security and Privacy (EuroS&P 2016)*

2014

Marco Guarnieri and David Basin
Optimal Security-Aware Query Processing
In: *40th International Conference on Very Large Data Bases (VLDB 2014)*

2013

Mario Arrigoni Neri, **Marco Guarnieri**, Eros Magri, Simone Mutti, and Stefano Paraboschi
A Model-Driven Approach for Securing Software Architectures
In: *10th International Conference on Security and Cryptography - Position Paper (Secrypt 2013)*

Marco Guarnieri, Mario Arrigoni Neri, Eros Magri, and Simone Mutti
On the Notion of Redundancy in Access Control Policies
In: *18th ACM Symposium on Access Control Models and Technologies (SACMAT 2013)*

Angelo Gargantini, **Marco Guarnieri**, and Eros Magri
AURORA: AUtomatic RObustness coveRage Analysis Tool
In: *6th IEEE International Conference on Software Testing, Verification and Validation - Testing Tools Track (ICST 2013)*

2012

Mario Arrigoni Neri, **Marco Guarnieri**, Eros Magri, Simone Mutti, and Stefano Paraboschi
Conflict Detection in Security Policies using Semantic Web Technology
In: *1st International IEEE-AESS Conference in Europe about Space and Satellite Telecommunications - Security Track (ESTEL 2012)*

Marco Guarnieri, Eros Magri, and Simone Mutti
Automated Management and Analysis of Security Policies using Eclipse
In: *7th Italian Workshop on Eclipse Technologies (Eclipse-IT 2012)*

Angelo Gargantini, **Marco Guarnieri**, and Eros Magri
Extending Coverage Criteria by Evaluating their Robustness to Code Structure Changes
In: *24th International Conference on Testing Software and Systems (ICTSS 2012)*

Francesco Bolis, Angelo Gargantini, **Marco Guarnieri**, Eros Magri, and Lorenzo Musto
Model-Driven Testing for Web Applications using Abstract State Machine
In: *8th International Workshop on Model-Driven and Agile Engineering for the Web - Short Paper (MDWE 2012)*

Francesco Bolis, Angelo Gargantini, **Marco Guarnieri**, and Eros Magri
Evolutionary Testing of PHP Web Applications with WETT
In: *4th International Symposium on Search-Based Software Engineering - Graduate Student Track (SSBSE 2012)*

Gabriel Serme, Anderson Santana De Oliveira, **Marco Guarnieri**, and Paul El Khoury
Towards Assisted Remediation of Security Vulnerabilities
In: *6th International Conference on Emerging Security Information, Systems and Technologies (Securware 2012)*

Marco Guarnieri, Eros Magri, Davide Brugali, and Luca Gherardi
A Domain Specific Language for Modeling Differential Constraints of Mobile Robots
In: *12th International Conference on Autonomous Robot Systems and Competitions (Robotica 2012)*

2011

Angelo Gargantini, **Marco Guarnieri**, and Eros Magri
An Eclipse based environment for conformance testing by FSMs
In: *6th Italian Workshop on Eclipse Technologies (Eclipse-IT 2011)*

Marco Guarnieri, Paul el Khoury, and Gabriel Serme
Security vulnerabilities detection and protection using Eclipse
In: *6th Italian Workshop on Eclipse Technologies (Eclipse-IT 2011)*

Other Publications

2019

Marco Guarnieri, Marco Patrignani
Exorcising Spectres with Secure Compilers
Technical report, `https://arxiv.org/abs/1910.08607`

2017

Marco Guarnieri
Formal Foundations for Access and Inference Control in Databases
Doctoral thesis, Advisor: Prof. David Basin
ETH Zurich, Switzerland

2012

Marco Guarnieri and Eros Magri
Techniques for Conflict Detection and Minimization for Access Control Policies
Master thesis, Advisor: Prof. Stefano Paraboschi
Università degli Studi di Bergamo, Italy

2010

Marco Guarnieri and Eros Magri
Sviluppo di un'applicazione Web-based sicura per il data outsourcing
(Development of a secure data outsourcing web application)
Bachelor thesis, Advisor: Prof. Stefano Paraboschi
Università degli Studi di Bergamo, Italy

Grants

2019

Ayudas Juan de la Cierva - formación (FJC2018-036513-I)
Granted to: **Marco Guarnieri**
Duration: 2020 – 2022
Amount: 50.000 €
Funding agency: Ministerio de Ciencia y Innovación

2018

Intel Strategic Research Alliance: Information Flow Tracking across the Hardware-Software Boundary
Principal Investigators: **Marco Guarnieri**, Jan Reineke, Boris Köpf
Duration: 2018 – 2021
Amount: 495.000 $
Funding agency: Intel Corporation

Ayudas para la atracción de talento investigador - modalidad 2 (2018-T2/TIC-11732)
Granted to: **Marco Guarnieri**
Duration: 2019 – 2023
Amount: 80.000 €
Funding agency: Comunidad de Madrid

Talks

2020

Microsoft Research Cambridge, Programming Language Seminar
CacheQuery: Learning Replacement Policies from Hardware Caches, Feb. 2020

Italian Conference on CyberSecurity (ITASEC 2020)
SPECTECTOR: Principled detection of speculative information flows, Feb. 2020

Workshop on Principles of Secure Compilation (PRISC 2020)
Exorcising Spectres with Secure Compilers, Jan. 2020

2019

Microsoft Research Cambridge, Programming Language Seminar
SPECTECTOR: Principled detection of speculative information flows, Nov. 2019

Workshop on Foundations of Computer Security 2019 (FCS 2019)
SPECTECTOR: Principled detection of speculative information flows, Jun. 2019

4th IEEE European Symposium on Security and Privacy (EuroS&P 2019)
Information-Flow Control for Database-backed Applications, Jun. 2019

2nd International workshop on the use of theorem provers for modelling and verification at the hardware-software interface (ENTROPY 2019)
Spectector: Principled detection of speculative information flows, Jun. 2019

Intel Side Channel Academic Program Workshop
Spectector: Principled detection of speculative information flows, Jun. 2019

Ruhr-Universität Bochum
Principled detection of speculative information flows, Mar. 2019

2018

CISPA – Helmholtz Center
Formal foundations for access and inference control in databases, May 2018

IMDEA Software Institute
Formal foundations for access and inference control in databases, Mar. 2018

ABB Corporate Research Center
Securing databases from probabilistic inferences, Jan. 2018

2017

Università degli Studi di Padova
Securing Databases from Probabilistic Inference, Sep. 2017

MIT, CSAIL seminar
Securing Databases from Probabilistic Inference, Sep. 2017

Harvard University, Programming language seminar
Securing Databases from Probabilistic Inference, Sep. 2017

Maryland University, Cybersecurity Center seminar,
Securing Databases from Probabilistic Inference, Sep. 2017

Stanford University, Formal methods seminar,
Securing Databases from Probabilistic Inference, Aug. 2017

30th IEEE Computer Security Foundations Symposium (CSF 2017)
Securing Databases from Probabilistic Inference, Aug. 2017

30th IEEE Computer Security Foundations Symposium (CSF 2017)
Reconciling Database Access Control and Information-flow Control, Aug. 2017

26th ACM SIGSOFT International Symposium on Software Testing and Analysis (ISSTA 2017)
Test Execution Checkpointing for Web Applications, Jul. 2017

Darmstadt University, Modeling and Analysis of Information Systems Graduate seminar
Securing Databases from Probabilistic Inference, Jun. 2017

2016

1st IEEE European Symposium on Security and Privacy (EuroS&P 2016)
Strong and Provably Secure Database Access Control, Mar. 2016

2014

40th International Conference on Very Large Data Bases (VLDB 2014)
Optimal Security-Aware Query Processing, Sep. 2014

2013

13th International School on Foundations of Security Analysis and Design (FOSAD)
ActionGUI, Sep. 2013

18th ACM Symposium on Access Control Models and Technologies (SACMAT 2013)
On the Notion of Redundancy in Access Control Policies, Jun. 2013

6th IEEE International Conference on Software Testing, Verification and Validation (ICST 2013)
AURORA: AUtomatic RObustness coveRage Analysis Tool, Mar. 2013

2012

7th Italian Workshop on Eclipse Technologies (Eclipse-IT 2012)
Automated Management and Analysis of Security Policies using Eclipse, Sep. 2012.

University of Luxembourg, SnT/SRM Research Seminar
Extending Coverage Criteria by Evaluating their Robustness to Code Structure Changes, Jul. 2012

ETH Zurich, Information Security group
Conflict Detection and Minimization Techniques for Access Control Policies, Jun. 2012

2011

6th Italian Workshop on Eclipse Technologies (Eclipse-IT 2011)
Security vulnerabilities detection and protection using Eclipse, Sep. 2011.

Service

2020

IEEE Computer Security Foundations Symposium (CSF)
Program Committee member

IEEE European Symposium on Security and Privacy (EuroS&P)
Program Committee member

ERC Advanced Grant 2019 Call
Remote referee

Journal of Computer Security
Reviewer

2019

ACM SIGPLAN conference on Systems, Programming, Languages, and Applications: Software for Humanity – OOPSLA track (OOPSLA)
External reviewer

French National Research Agency 2019 generic call
Scientific Expert

IEEE Transactions on Dependable and Secure Computing (TDSC)
Reviewer

49th IEEE/IFIP International Conference on Dependable Systems and Networks (DSN)
External reviewer

2018

19th Privacy Enhancing Technologies Symposium (PETS)
External reviewer

IEEE Transactions on Information Forensics and Security (TIFS)
Reviewer

2017

ACM Conference on Computer and Communications Security (CCS)
External reviewer

VLDB Journal
Reviewer

2016

European Symposium on Research in Computer Security (ESORICS)
External reviewer

International Conference on Fundamental Approaches to Software Engineering (FASE)
External reviewer

2013

VLDB Journal
Reviewer

Teaching

Universidad Politécnica de Madrid   *Madrid, Spain*

LECTURER

Seguridad Informatica — Fall 2018–2019

ETH Zurich   *Zurich, Switzerland*

TEACHING ASSISTANT

Security Engineering — Autumn 2013–2016
Information Security — Spring 2015, Spring 2018
Design of Digital Circuits — Spring 2017
Informatik fur Mathematiker und Physiker — Autumn 2017

Università degli Studi di Bergamo *Bergamo, Italy*

Object Oriented Programming – Spring 2011–2012

Mentoring

Master Students

Tristan Buchs, Checkpointing-Based Testing, Master Thesis, ETH Zurich, Fall 2015
Ernst Zachow, Improving the Efficiency of Fuzz Testing Using Checkpointing, Master Thesis, ETH Zurich, Fall 2014
Marco Lazzari, Systematic Testing of TOR, Master Thesis, ETH Zurich, Fall 2014

Bachelor Students

Andrés Sánchez, Detecting speculative information-flows in large code bases, IMDEA Software Institute, Spring 2019
Javier Lopez Alonso, Formal models for speculative execution, IMDEA Software Institute, Spring 2019
Mohammed Ajil, Strong and Secure Access Control for PostgreSQL, Bachelor Thesis, ETH Zurich, Spring 2016

Research Interns

Andrés Sánchez, Reasoning about speculative execution attacks, IMDEA Software Institute, Fall 2018
Mohamed Moanis Ali, Speculative execution attacks, IMDEA Software Institute, Fall 2019

Honors & Awards

2012 **Scholarship of the city of Ciserano**, Italy
2011 **Scholarship of Università degli Studi di Bergamo (best engineering student)**, Italy
2010 **Scholarship of the city of Ciserano**, Italy
2007 **Scholarship of the city of Ciserano**, Italy