

Marco Guarnieri

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Education

ETH Zurich

PHD IN COMPUTER SCIENCE

Advisor: Prof. David Basin

Zurich, Switzerland

Oct. 2012 - Jan. 2018

Università degli Studi di Bergamo

MASTER OF SCIENCE IN COMPUTER ENGINEERING

Advisor: Prof. Stefano Paraboschi

Bergamo, Italy

Sep. 2010 - Jul. 2012

BACHELOR OF SCIENCE IN COMPUTER ENGINEERING

Advisor: Prof. Stefano Paraboschi

Sep. 2007 - Sep. 2010

Professional Experience

IMDEA Software Institute

ASSISTANT RESEARCH PROFESSOR

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

Madrid, Spain

Jun. 2019 - PRESENT

RESEARCHER

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

Apr. 2019 - May 2019

POSTDOCTORAL RESEARCHER

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

Jul. 2018 - Apr. 2019

ETH Zurich

POSTDOCTORAL RESEARCHER

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

Zurich, Switzerland

Feb. 2018 - May 2018

RESEARCH ASSISTANT

Research Areas: Computer security, Databases, Access control

Oct. 2012 - Jan. 2018

Università degli Studi di Bergamo

RESEARCH ASSISTANT

Research Areas: Access control, Model-driven engineering

Bergamo, Italy

Aug. 2012 - Sep. 2012

SAP Labs France

R&D INTERN

Research Areas: Security, Static analysis

Sophia Antipolis, France

Jun. 2010 - Sep. 2010

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

41st IEEE Symposium on Security and Privacy (S&P 2020)
SPECTECTOR: Principled detection of speculative information flows, May 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

ACM SIGSAC Workshop on Programming Languages and Security (PLAS)
Program Committee member

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

PhD thesis committees

2019

Samira Briongos Herrero, Analysis and design of microarchitectural side-channel attacks and countermeasures
Universidad Politécnica de Madrid, Escuela Técnica Superior de Ingenieros de Telecomunicación 29/11/2019

Irfan Ul Haq, Lineage Inference of Packed Malware using Binary Code Similarity
Universidad Politécnica de Madrid, Escuela Técnica Superior de Ingenieros Informáticos 12/11/2019

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 für Mathematiker und Physiker — Autumn 2017

Università degli Studi di Bergamo

Bergamo, Italy

TEACHING ASSISTANT

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