

Marco Guarnieri

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Education

ETH Zurich

PHD IN COMPUTER SCIENCE

Zurich, Switzerland

Oct. 2012 - Jan. 2018

Research Areas: Computer security, Databases, Access control

Advisor: Prof. David Basin

Università degli Studi di Bergamo

MASTER OF SCIENCE IN COMPUTER ENGINEERING

Bergamo, Italy

Sep. 2010 - Jul. 2012

Relevant coursework: Theoretical computer science, Enterprise IT infrastructures, Telecommunications networks, Information technology III, Languages and compilers, Management of ICT systems, Computer security, Advanced algorithms, Operational research, Stochastic models

Advisor: Prof. Stefano Paraboschi

Università degli Studi di Bergamo

BACHELOR OF SCIENCE IN COMPUTER ENGINEERING

Bergamo, Italy

Sep. 2007 - Sep. 2010

Relevant coursework: Computer architectures, Information technology I & II, Computer networks, Operating systems, Software engineering, Information systems I & II, Internet applications, Internet architecture and protocols, Statistics

Advisor: Prof. Stefano Paraboschi

Professional Experience

IMDEA Software Institute

POSTDOCTORAL RESEARCHER

Madrid, Spain

Jul. 2018 - PRESENT

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

ETH Zurich

POSTDOCTORAL RESEARCHER

Zurich, Switzerland

Feb. 2018 - May 2018

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

ETH Zurich

RESEARCH ASSISTANT

Zurich, Switzerland

Oct. 2012 - Jan. 2018

Research Areas: Computer security, Databases, Access control

Focus: development of provably secure enforcement mechanisms for database systems

Università degli Studi di Bergamo

RESEARCH ASSISTANT

Bergamo, Italy

Aug. 2012 - Sep. 2012

Research Areas: Access control, Model-driven engineering

Focus: analysis of access control policies, assisted remediation of policy misconfigurations, model-driven engineering of security architectures

SAP Labs France

R&D INTERN

Sophia Antipolis, France

Jun. 2010 - Sep. 2010

Research Areas: Security, Static analysis

Focus: automated detection of injection vulnerabilities in Java programs

Salvaneschi & Partners, Software and System Engineering

TESTING CONSULTANT

Bergamo, Italy

Oct. 2009 - Mar. 2010

Focus: design of test plans and test cases for functional acceptance testing of enterprise applications

Skills

Programming Java (*advanced*), SQL (*advanced*), C/C++ (*basic*), Python (*basic*), Assembler (*basic*)

Web HTML (*basic*), CSS (*basic*)

Operating Systems Linux, MacOS, Windows

Languages Italian (*native*), English (*professional*), German (*basic*), Spanish (*basic*)

Conference and Workshop Publications

2019

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

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

2018

Marco Guarnieri, Boris Köpf, José F. Morales, Jan Reineke, Andrés Sánchez
SPECTECTOR: Principled Detection of Speculative Information Flows
Under submission

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

2018

Ayudas para la atracción de talento investigador (ayudas para la contratación de jóvenes doctores)
Granted to: Marco Guarnieri
Duration: 2019 – 2023
Amount: 80.000 €
Funding agency: Comunidad de Madrid

Talks

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

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

2019 **49th IEEE/IFIP International Conference on Dependable Systems and Networks (DSN)**, External reviewer

2018 **19th Privacy Enhancing Technologies Symposium (PETS)**, External reviewer

2018 **IEEE Transactions on Information Forensics and Security (TIFS)**, External reviewer

2017 **ACM Conference on Computer and Communications Security (CCS)**, External reviewer

2017 **VLDB Journal**, External reviewer

2016 **European Symposium on Research in Computer Security (ESORICS)**, External reviewer

2016 **Intl. Conference on Fundamental Approaches to Software Engineering (FASE)**, External reviewer

2013 **VLDB Journal**, External reviewer

Teaching

Universidad Politécnica de Madrid

Madrid, Spain

GUEST LECTURER

Seguridad Informatica — Fall 2018

ETH Zurich

Zurich, Switzerland

TEACHING ASSISTANT

Security Engineering — Autumn 2013–2016

Information Security — Spring 2015, Spring 2018

Design of Digital Circuits — Spring 2017

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

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

References

David Basin

FULL PROFESSOR, ETH ZURICH

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Phone: +41 44 632 71 90

Boris Köpf

RESEARCHER, MICROSOFT RESEARCH CAMBRIDGE

Email: boris.koepf@microsoft.com

Andrei Sabelfeld

FULL PROFESSOR, CHALMERS UNIVERSITY OF TECHNOLOGY

Email: andrei@chalmers.se
Phone: +46 31 772 10 18

Stefano Paraboschi

FULL PROFESSOR, UNIVERSITÀ DEGLI STUDI DI BERGAMO

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Phone: +39 035 20 52 356