

Marco Chiesa | Curriculum Vitae

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I am a postdoctoral researcher at the Université catholique de Louvain. My research interests lie in computer networking and, more specifically, in aspects of Internet protocols and architectures ranging from **security and privacy** to **network design and optimization**. I am a leading contributor to the ENDEAVOUR (H2020 EU funded) project, intended to bring Software-Defined Networking (SDN) functionality to inter-domain routing on the Internet.

Academics

- **KTH Royal Institute of Technology** **Stockholm, Sweden**
Assistant Professor
Networked Systems Lab
January 2018–now
- **Université catholique de Louvain** **Louvain-la-neuve, Belgium**
Postdoctoral researcher, “Endeavour” H2020 EU funded project
Advisor: Prof. Marco Canini
August 2015–December 2017

Designed, built, and evaluated SIXPACK [w25] [c1], a privacy-preserving interdomain route-dispatch system for Internet eXchange Points (IXPs) that leverages Secure Multi-Party Computation (SMPC). Contributed to the Endeavour IXP platform [j17], a new SDN-based architecture for IXPs. Collaborated on ez-Segway [w24] [c2], a distributed network update mechanism.
- **Hebrew University of Jerusalem** **Jerusalem, Israel**
Postdoctoral researcher, I-CORE “Fibonacci” fellowship
Advisor: Prof. Michael Schapira
March 2014–August 2015

Designed, built, and evaluated COYOTE [c4][u26], a readily deployable SDN-like traffic-engineering scheme for robust and efficient network utilization.
- **ICSI/UC Berkeley** **Berkeley, CA, US**
Visiting Ph.D. student
Host: Prof. Scott Shenker
Aug 2013–Dec 2013

Designed, built, and evaluated novel fast-reroute algorithms in a variety of models [c5] [c6] [j15]: deterministic routing, routing with packet-duplication, routing with packet-header-rewriting, and randomized routing.
- **Hebrew University of Jerusalem** **Jerusalem, Israel**
Visiting Ph.D. student
Host: Prof. Michael Schapira
Oct 2012–Apr 2013

Embarked upon a systematic algorithmic study of traffic engineering with OSPF/ECMP in arbitrary and datacenter [c7][j16].
- **Roma Tre University** **Rome, Italy**
Ph.D. in computer science
Advisor: Prof. Giuseppe Di Battista
2011–2013
Degree Thesis: The Role of Routing Policies in the Internet: Stability, Security, and Load-Balancing

Formally analyzed Internet routing properties related to security and stability Internet aspects [c8][c10][c11].

- **Roma Tre University**

B.sc and M.sc. in computer science

M.sc. advisor: Prof. Giuseppe Di Battista

M.sc. degree thesis: Inter-domain routing: relating the expressive power of router configuration languages to the complexity of stability-related decision problems

Rating: 110/110 with honors

Rome, Italy

2005–2010

Publications

International conference publications.....

- [c1] **M. Chiesa**, D. Demmler, M. Canini, M. Schapira, T. Schneider. SIXPACK: Securing Internet eXchange Points Against Curious onlookers. In *ACM Conference on emerging Networking EXperiments and Technologies (CoNEXT)*, 2017. Acceptance rate: 18%.
- [c2] T. D. Nguyen, **M. Chiesa**, M. Canini. Decentralized Fast Consistent Updates. In *ACM Symposium on SDN Research (SOSR)*, 2017. Acceptance rate: 23%.
- [c3] **M. Chiesa**, R. di Lallo, G. Lospoto, H. Mostafei, M. Rimondini, G. Di Battista. PrIXP: Preserving the Privacy of Routing Policies at Internet eXchange Points. In *IFIP/IEEE International Symposium on Integrated Network Management (IM)*, 2017.
- [c4] **M. Chiesa**, G. Retvari, M. Schapira. Lying Your Way to Better Traffic Engineering. In *ACM Conference on emerging Networking EXperiments and Technologies (CoNEXT)*, 2016. Acceptance rate: 18%.
- [c5] **M. Chiesa**, I. Nikolaevskiy, S. Mitrovic, A. Gurtov, A. Mądry, A. Panda, M. Schapira, S. Shenker. The Quest for Resilient Static Forwarding Tables. In *IEEE International Conference on Computer Communications (INFOCOM)*, 2016. Acceptance rate: 18%.
- [c6] **M. Chiesa**, I. Nikolaevskiy, S. Mitrovic, A. Gurtov, A. Mądry, M. Schapira, S. Shenker. On the Resiliency of Randomized Routing Against Multiple Edge Failures. In *International Colloquium on Automata, Languages, and Programming (ICALP)*, 2016. Acceptance rate: 28%.
- [c7] **M. Chiesa**, G. Kindler, M. Schapira. Traffic Engineering with Equal-Cost-Multipath: an Algorithmic Perspective. In *IEEE International Conference on Computer Communications (INFOCOM)*, 2014. Acceptance rate: 19%.
- [c8] **M. Chiesa**, L. Cittadini, Laurent Vanbever, S. Vissicchio, G. Di Battista. Using Routers to Build Logic Circuits: How Powerful is BGP?. In *IEEE International Conference on Network Protocols (ICNP)*, 2013. Acceptance rate: 18%. **Best Paper Award. Applied Network Research Prize external nomination.**
- [c9] **M. Chiesa**, G. Lospoto, M. Rimondini, G. Di Battista. Intra-Domain Pathlet Routing. In *IEEE International Conference on Computer Communications and Networks (ICCCN)*, 2013. Acceptance rate: 30%.
- [c10] **M. Chiesa**, G. Di Battista, T. Erlebach, M. Patrignani. Computational Complexity of Traffic Hijacking under BGP and S-BGP. In *International Colloquium on Automata, Languages, and Programming (ICALP)*, 2012. Acceptance rate: 28%.
- [c11] **M. Chiesa**, L. Cittadini, G. Di Battista, S. Vissicchio. Local Transit Policies and the Complexity of BGP Stability Testing. In *IEEE International Conference on Computer Communications (INFOCOM)*, 2011. Acceptance rate: 15%.
- [c12] A. Dainotti, C. Squarcella, E. Aben, K. C. Claffy, **M. Chiesa**, M. Russo, A. Pescapé. Analysis of Country-wide Internet Outages Caused by Censorship. In *ACM Internet Measurement Conference (IMC)*, 2011. Acceptance rate: 19%. **Applied Network Research Prize.**
- [c13] P. Angelini, T. Bruckdorfer, **M. Chiesa**, F. Frati, M. Kaufmann, C. Squarcella. On the Area Requirements of Euclidean Minimum Spanning Trees. In *Algorithms and Data Structures Symposium (WADS)*, 2011.

International journal publications.....

- [j14] G. Antichi, I. Castro, **M. Chiesa**, E. Fernandes, R. Lapeyrade, D. Kopp, J. Han, M. Bruyere, C. Dietzel, M. Gusat, A. W. Moore, P. Owezarski, S. Uhlig, M. Canini ENDEAVOUR: A Scalable SDN Architecture for Real-World IXPs. In *IEEE JSAC Special issue on Emerging Technologies in Software-driven Communication (JSAC)*, 2017.
- [j15] **M. Chiesa**, I. Nikolaevskiy, S. Mitrovic, A. Gurtov, A. Mądry, M. Schapira, S. Shenker. On the Resiliency of Static Forwarding Tables. In *IEEE/ACM Transactions on Networking (ToN)*, 2017.
- [j16] **M. Chiesa**, G. Kindler, M. Schapira. Traffic engineering with Equal-Cost-Multipath: An algorithmic perspective. In *IEEE/ACM Transactions on Networking (ToN)*, 2017.
- [j17] **M. Chiesa**, C. Dietzel, G. Antichi, M. Bruyere, I. Castro, M. Gusat, T. King, A. W. Moore, T. D. Nguyen, P. Owezarski, S. Uhlig, M. Canini. Inter-domain Networking Innovation on Steroids: Empowering IXPs with SDN Capabilities. In *IEEE Communications Magazine special issue on SDN Use Cases for Service Provider Networks (Comm. Mag.)*, October, 2016.
- [j18] **M. Chiesa**, G. Di Battista, T. Erlebach, M. Patrignani. Computational Complexity of Traffic Hijacking under BGP and S-BGP. In *Theoretical Computer Science (TCS)*, 600:143-154. 2015.
- [j19] A. Dainotti, C. Squarcella, E. Aben, K. C. Claffy, **M. Chiesa**, M. Russo, A. Pescapé. Analysis of Country-wide Internet Outages Caused by Censorship. In *IEEE/ACM Transactions on Networking (ToN)*, 22(6):1964-1977. 2014.
- [j20] **M. Chiesa**, G. Lospoto, M. Rimondini, G. Di Battista. Intra-Domain Routing with Pathlets. In *Computer Communications (Comp. Comm.)*, 46:76-86. 2014.
- [j21] P. Angelini, T. Bruckdorfer, **M. Chiesa**, F. Frati, M. Kaufmann, C. Squarcella. On the Area Requirements of Euclidean Minimum Spanning Trees. In *Computational Geometry: Theory and Applications (CG)*, 47(2):200-213. 2014. Special Issue on Selected Papers from WADS '11.

Workshop papers, extended abstracts, demo, and posters.....

- [w22] A. Dethise, **M. Chiesa**, M. Canini. Poster: Privacy-Preserving Detection of Inter-Domain SDN Rules Overlaps. In *(SIGCOMM)*, 2017
- [w23] C. Dietzel, G. Antichi, I. Castro, E. Fernandes, **M. Chiesa**, D. Kopp. Demo: SDN-enabled Traffic Engineering and Advanced Blackholing at IXPs. In *Symposium on SDN Research (SOSR)*, 2017
- [w24] T. D. Nguyen, **M. Chiesa**, M. Canini. Towards Decentralized Fast Consistent Updates. In *Applied Networking Research Workshop (ANRW)*, 2016. Workshop paper.
- [w25] **M. Chiesa**, D. Demmler, M. Canini, M. Schapira, T. Schneider. Poster: Towards Securing Internet eXchange Points Against Curious onlookers. In *Applied Networking Research Workshop (ANRW)*, 2016.

Under submission (Non double-blind).....

- [u26] **M. Chiesa**, G. Retvari, M. Schapira. Lies, Damned Lies, and Traffic Engineering: Oblivious Routing in IP Networks. Submitted to *Transactions on Networking (ToN)*. 2017.

Selected Awards

- **Best Paper**
ICNP 2013
- **IETF Applied Research Networking Prize 2012**
"Analysis of Country-wide Internet Outages Caused by Censorship"

- **IETF Applied Research Networking Prize 2013 external nomination**
"Using Routers to Build Logic Circuits: How Powerful is BGP?"
- **Travel Grants**
INFOCOM 2011, ICNP 2013
- **National Mathematics Competitions 2005**
4th placement at the Italian Kangourou mathematics competition (Mirabilandia, Italy)
Honorable mention at the Italian championship in mathematics (Cesenatico, Italy)
7th place at the regional mathematics competition within the area of Rome (Italy). Over 100,000 students.

Professional Service

- **Co-chair**
SIGCOMM Student Research Competition 2018
- **Program Committee**
HPSR 2018
APNeT 2018
EuroSys Doctoral Workshop 2018
SOSR 2018
CCGrid 2018
INFOCOM 2018
ICNP 2017
ITC 2017
SWFAN 2017 (Infocom workshop)
- **External Reviewer**
Transactions on Networking (ToN) 2016–2018
Transactions on Mobile Computing (TMC) 2017–2018
Transactions on Network and Service Management (TNSM) 2016–2018
Parallel Processing Letters 2017
INFOCOM 2016–2017
ACM Computer Communication Review 2017
SOSR 2017
COMCOM 2017
IFIP Networking 2017
ICALP 2016
Symposium on Experimental Algorithms (SEA) 2013
Graph Drawing 2012
- **Affiliations**
ACM (Association for Computing Machinery) 2015–2017
IEEE (Institute of Electrical and Electronics Engineers) 2011–2017

Selected Talks

- **University of Warwick** **Coventry, UK**
Routing the Future: Bootstrapping Internet Innovation *July 2017*
- **KTH Royal Institute of Technology** **Stockholm, Sweden**
Routing the Future: Bootstrapping Internet Innovation *June 2017*
- **University of Cambridge** **Cambridge, England, UK**
Routing the Future: Bootstrapping Internet Innovation *May 2017*

- **University of Edinburgh** **Edinburgh, Scotland, UK**
Routing the Future: Bootstrapping Internet Innovation *Apr 2017*
- **King Abdullah University of Science and Technology** **Thuwal, Saudi Arabia**
Securing Interdomain Routing Against Curious onlookers *Jan 2017*
- **Université catholique de Louvain** **Louvain-la-neuve, Belgium**
Routing the Future: Bootstrapping Internet Innovation *Jan 2017*
- **CoNEXT** **Irvine, CA, US**
Lying Your Way to Better Traffic Engineering *Dec 2016*
- **Fraunhofer SIT Institute** **Darmstadt, Germany**
Securing Internet Routing: an SDN Approach *Nov 2016*
- **Amsterdam Internet eXchange Point (AMS-IX)** **Amsterdam, Netherlands**
Securing Interdomain Routing Against Curious onlookers *Oct 2016*
- **Applied Networking Research Workshop (ANRW)** **Berlin, Germany**
Towards Decentralized Fast Consistent Updates *Jul 2016*
- **Applied Networking Research Workshop (ANRW)** **Berlin, Germany**
Towards Securing Interdomain Routing Against Curious onlookers *Jul 2016*
- **INFOCOM** **San Francisco, CA, US**
The Quest for Resilient Static Forwarding Tables *Apr 2016*
- **Deutscher Commercial Internet Exchange (DE-CIX)** **Frankfurt, Germany**
Securing Interdomain Routing Against Curious onlookers *Mar 2016*
- **Summer Networking at the Hebrew University of Jerusalem** **Jerusalem, Israel**
Towards Optimized and Reliable Interdomain Routing *Jul 2015*
- **Budapest University of Technology and Economics** **Budapest, Hungary**
Towards Optimized and Reliable Interdomain Routing *Jun 2015*
- **Université catholique de Louvain** **Louvain-la-neuve, Belgium**
Towards Optimized and Reliable Interdomain Routing *May 2015*
- **Roma Tre University** **Rome, Italy**
The Role of Routing Policies in the Internet: Stability, Security, and Load-Balancing *Jun 2014*
- **INFOCOM** **Toronto, Canada**
Traffic Engineering with Equal-Cost-Multipath: an Algorithmic Perspective *Apr 2014*
- **I-CORE Algo Day** **Tel Aviv, Israel**
Traffic Engineering with Equal-Cost-Multipath: an Algorithmic Perspective *Apr 2014*
- **ICNP** **Göttingen, Germany**
Using Routers to Build Logic Circuits: How Powerful is BGP? *Oct 2013*
- **ICALP** **Warwick, UK**
Computational Complexity of Traffic Hijacking under BGP and S-BGP *Jul 2012*
- **University of Leicester** **Leicester, UK**
Computational Complexity of Traffic Hijacking under BGP and S-BGP *Jul 2012*
- **INFOCOM** **Shanghai, China**
Local Transit Policies and the Complexity of BGP Stability Testing *Apr 2011*
- **AlgoDEEP** **Rome, Italy**
Local Transit Policies and the Complexity of BGP Stability Testing *Apr 2011*

Teaching Experience

- **Master thesis reader** **Université catholique de Louvain**
Reader for one master thesis *Spring 2017*
- **Teaching Assistant** **Université catholique de Louvain**
INGI 2142 Computer networks: configuration and management *Spring 2017*
- **Student supervision** **Université catholique de Louvain**
Informal advisor to two Ph.D. students *Spring 2017*
- **Student supervision** **Roma Tre University**
Informal advisor to two master students *Spring 2017*
- **Student supervision** **Université catholique de Louvain**
Informal advisor to one master student *Spring 2017*
- **Guest lecture** **Université catholique de Louvain**
INGI2347 Computer System Security *Spring 2016*
- **INGI2349 Network and Communication Seminar** **Université catholique de Louvain**
Graded students oral presentations *Autumn 2015*
- **Advanced seminars on Oblivious Routing** **Hebrew University of Jerusalem**
Designed and taught a seminar course for postgraduate students *Spring 2015*
- **Students supervision** **Roma Tre University**
Informally advised two bachelor and one master students *2012–2013*
Published one conference [c9] and one journal [j20] paper
- **Thesis reviewer** **Roma Tre University**
Read, reviewed, and graded 11 external B.sc./M.sc. thesis *2011–2013*

Research Visits ≥ 10 days

- **King Abdullah University of Science and Technology** **Thuwal, Saudi Arabia**
Invited visitor, Department of Computer Science *Jan-Feb 2017*
Host: Prof. Marco Canini
Keywords: Internet architecture and security
- **Hebrew University of Jerusalem** **Jerusalem, Israel**
Invited visitor, Department of Computer Science *Mar 2016*
Host: Prof. Michael Schapira
Keywords: oblivious routing
- **Budapest University of Technology and Economics** **Budapest, Hungary**
Invited visitor, Department of Computer Science *May 2015–Jun 2015*
Host: Dr. Gábor Rétvári
Keywords: oblivious routing
- **UC Berkeley** **Berkeley, CA, US**
Invited visitor, Department of Computer Science *Aug 2014*
Host: Prof. Scott Shenker
Keywords: data-plane connectivity
- **International Computer Science Institute and UC Berkeley** **Berkeley, CA, US**
Visiting Research Fellow, Department of Computer Science *Aug 2012–Dec 2013*
Host: Prof. Scott Shenker
Keywords: deflection switching, network utilization

- **Hebrew University of Jerusalem** **Jerusalem, Israel**
Visiting Research Fellow, Department of computer Science
Host: Prof. Michael Schapira
Keywords: traffic-engineering, ECMP
Oct 2012–Apr 2013
- **University of Leicester** **Leicester, UK**
Visiting Student, Department of Computer Science
Host: Prof. Thomas Erlebach
Keywords: routing, bgp, migrations, algorithms
July 2012
- **Université catholique de Louvain** **Louvain-la-neuve, Belgium**
Visiting Student, IP Networking Lab, Department of Computer Science
Host: Prof. Olivier Bonaventure, Dr. Stefano Vissicchio, and Dr. Laurent Vanbever
Keywords: routing, bgp, migrations, point-of-presence design
May 2012

Languages

Italian: Mothertongue

English: Proficient

fluent (writing, speaking, reading)

Polish: Independent

intermediate (writing, speaking, reading)

French: Beginner/Independent

basic (writing, speaking); intermediate (reading); level A1 certification

Hebrew: Beginner

basic (writing, speaking, reading)

Swedish: Beginner

basic (writing, speaking, reading)