

# 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

- **Université catholique de Louvain** **Louvain-la-neuve, Belgium**  
*Postdoctoral researcher, "Endeavour" H2020 EU funded project* *August 2015–now*  
Advisor: Prof. Marco Canini  

Designed, built, and evaluated SIXPACK [w24] ??, 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 [j16], a new SDN-based architecture for IXPs. Collaborated on ez-Segway [w23] [c1], a distributed network update mechanism.
- **Hebrew University of Jerusalem** **Jerusalem, Israel**  
*Postdoctoral researcher, I-CORE "Fibonacci" fellowship* *March 2014–August 2015*  
Advisor: Prof. Michael Schapira  

Designed, built, and evaluated COYOTE [c3][u25], a readily deployable SDN-like traffic-engineering scheme for robust and efficient network utilization.
- **ICSI/UC Berkeley** **Berkeley, CA, US**  
*Visiting Ph.D. student* *Aug 2013–Dec 2013*  
Host: Prof. Scott Shenker  

Designed, built, and evaluated novel fast-reroute algorithms in a variety of models [c4] [c5] [j14]: deterministic routing, routing with packet-duplication, routing with packet-header-rewriting, and randomized routing.
- **Hebrew University of Jerusalem** **Jerusalem, Israel**  
*Visiting Ph.D. student* *Oct 2012–Apr 2013*  
Host: Prof. Michael Schapira  

Embarked upon a systematic algorithmic study of traffic engineering with OSPF/ECMP in arbitrary and datacenter [c6][j15].
- **Roma Tre University** **Rome, Italy**  
*Ph.D. in computer science* *2011–2013*  
Advisor: Prof. Giuseppe Di Battista  
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 [c7][c9][c10].
- **Roma Tre University** **Rome, Italy**  
*B.sc and M.sc. in computer science* *2005–2010*  
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

## Publications

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### International conference publications.....

- [c1] T. D. Nguyen, **M. Chiesa**, M. Canini. Decentralized Fast Consistent Updates. In *ACM Symposium on SDN Research (SOSR)*, 2017.
- [c2] **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.
- [c3] **M. Chiesa**, G. Retvari, M. Schapira. Lying Your Way to Better Traffic Engineering. In *ACM Conference on emerging Networking EXperiments and Technologies (CoNEXT)*, 2016.
- [c4] **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.
- [c5] **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.
- [c6] **M. Chiesa**, G. Kindler, M. Schapira. Traffic Engineering with Equal-Cost-Multipath: an Algorithmic Perspective. In *IEEE International Conference on Computer Communications (INFOCOM)*, 2014.
- [c7] **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. **Best Paper Award. Applied Network Research Prize external nomination.**
- [c8] **M. Chiesa**, G. Lospoto, M. Rimondini, G. Di Battista. Intra-Domain Pathlet Routing. In *IEEE International Conference on Computer Communications and Networks (ICCCN)*, 2013.
- [c9] **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.
- [c10] **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.
- [c11] 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. **Applied Network Research Prize.**
- [c12] 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.....

- [j13] 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.
- [j14] **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.
- [j15] **M. Chiesa**, G. Kindler, M. Schapira. Traffic engineering with Equal-Cost-Multipath: An algorithmic perspective. In *IEEE/ACM Transactions on Networking (ToN)*, 2017.

- [j16] **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.
- [j17] **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.
- [j18] 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.
- [j19] **M. Chiesa**, G. Lospoto, M. Rimondini, G. Di Battista. Intra-Domain Routing with Pathlets. In *Computer Communications (Comp. Comm.)*, 46:76-86. 2014.
- [j20] 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.....

- [w21] A. Dethise, **M. Chiesa**, M. Canini. Poster: Privacy-Preserving Detection of Inter-Domain SDN Rules Overlaps. In (**SIGCOMM**), 2017
- [w22] 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
- [w23] T. D. Nguyen, **M. Chiesa**, M. Canini. Towards Decentralized Fast Consistent Updates. In *Applied Networking Research Workshop (ANRW)*, 2016. Workshop paper.
- [w24] **M. Chiesa**, D. Demmler, M. Canini, M. Schapira, T. Schneider. Towards Securing Internet eXchange Points Against Curious onlookers. In *Applied Networking Research Workshop (ANRW)*, 2016. Extended abstract and poster.

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

- [u25] **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

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- **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

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- **Program Committee**
  - CCGrid 2018*
  - INFOCOM 2018*
  - ICNP 2017*
  - ITC 2017*
  - SWFAN 2017 (Infocom workshop)*
- **External Reviewer**
  - Parallel Processing Letters 2017*
  - INFOCOM 2016–2017*
  - Transactions on Networking (ToN) 2016–2017*
  - ACM Computer Communication Review 2017*
  - SOSR 2017*
  - COMCOM 2017*
  - IFIP Networking 2017*
  - Transactions on Network and Service Management (TNSM) 2016*
  - ICALP 2016*
  - Symposium on Experimental Algorithms (SEA) 2013*
  - Graph Drawing 2012*
- **Affiliations**
  - ACM (Association for Computing Machinery)*
  - IEEE (Institute of Electrical and Electronics Engineers)*

## Selected Talks

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- **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*
- **King Abdullah University of Science and Technology** **Thuwal, Saudi Arabia**
  - Securing Interdomain Routing Against Curious onlookers* *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

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- **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 [c8] and one journal [j19] paper*
- **Thesis reviewer** **Roma Tre University**  
*Read, reviewed, and graded 11 external B.sc./M.sc. thesis* *2011–2013*

## Research Visits $\geq 10$ days

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

## Languages

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**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)*

# Marco Chiesa | Cover letter

Dear Rector Prof. Paolo Collini,

I am excited to apply for the position of Assistant Professor at the University of Trento (vacancy reference POSITIONS-2016). I am currently working as a postdoctoral researcher at UCLouvain in August 2015. Prior to moving to UCLouvain, I was a postdoctoral researcher at the Hebrew University of Jerusalem (Israel) for over a year and a half, a long-term visiting scholar at UC Berkeley (California, US), and a Ph.D. student at Roma Tre University (Italy, PhD degree received in 2014).

I am eager to shape the next-generation of graduate students and conduct disruptive research under the auspices of University of Trento.

I deem myself highly qualified for the position, as explained below. My research is internationally recognized, as evidenced by a long track of top-level publications and several prestigious prizes, and spans a broad spectrum of topics, ranging from pure theory results to industry-driven applied research. My main research focus revolves around the crucial and timely topic of Internet protocols and architectures, which is of ever-growing importance in both academia and industry. I closely collaborate with top researchers in this area, from the premier universities in the US, Europe, and the Middle East: Scott Shenker (UC Berkeley), Aleksander Madry (MIT), Stefano Vissicchio (University College of London), Laurent Vanbever (ETH Zurich), Gábor Rétvári (Budapest University), Michael Schapira (Hebrew University of Jerusalem), and Marco Canini (King Abdullah University). I also cemented relationships with the emerging big players in the Internet ecosystem such as the two largest interconnection networks for exchange of Internet traffic, Deutscher Commercial Internet Exchange (DECIX) and Amsterdam Internet Exchange (AMSIX). Finally, as a native Italian speaker, I am facilitated in the process of integrating within the social and work environment.

As an assistant professor at University of Trento, I look forward to a career involving teaching activities. I expect to engage students with exciting courses and projects in computer science, and to prepare them for the industrial and academic worlds. In this vein, I believe that my network-specific teaching offer will further help students in being competitive on the job market. I plan to advise graduate students towards their doctoral studies and to form a highly successful and active research group. I also expect to maintain strong ties with industrial partners, with the objectives of cross-pollinating my research activity with ideas and techniques from different areas, and of securing an essential source of funding for my research group.

I would like to further emphasize my strong interests in this position. First, with a flourishing tech community thriving around the university, Trento is turning into a vibrant and energetic environment that is recognized as a leading technology hub and catalyst for innovation, an ideal place for starting an academic career. Second, despite being raised in Rome, my grandparents were originally from Trentino, a magnificent region that I learned to love during a few visits in the past and that I believe would perfectly suit my needs.

Yours sincerely,

Louvain-la-neuve, 15 November 2016



Marco Chiesa