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Marco Mellia

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WORK EXPERIENCE

15/03/2019 – CURRENT Torino, Italy
FULL PROFESSOR POLITECNICO DI TORINO

Full Professor at the Control and Computer Engineering Department. Topics: Computer Networks, Big Data, Cybersecurity, Machine Learning, Privacy, Data Science. Business or sector Education and research

30/09/2014 Torino, Italy
COORDINATOR OF THE SMARTDATA@POLITO CENTER POLITECNICO DI TORINO

Interdepartmental Center– www.smartdata.polito.it - The SmartData@PoliTO centre focuses on Big Data technologies, Data Science, Machine Learning and Artificial Intelligent approaches. It blends interdisciplinary people and competencies from different domains to provide cross-domain solutions to the widest spectrum of knowledge discovery challenges, by leveraging advanced expertise in data science, from data management to data modelling, analytics, and engineering. It is a well-recognized centre where experts in methodologies, and domain experts from various disciplines work in a single space, facing both theoretical problems and helping companies with applications.

31/01/2017 – CURRENT Torino, Italy
CO-FOUNDER ERMES CYBER SECURITY SRL

Co-founder. Together with Dr. Stefano Traverso and Dr. Hassan Metwalley I founded Ermes Cyber Security SRL, a start-up which provides advanced anti-tracking solutions for business scenarios based on Machine Learning and Artificial Intelligence. He leads the development team and contributes substantially to the product design, development and deployment. He also leads the traffic analysis tasks aimed at identifying trackers. Business or sector CyberSecurity, Artificial Intelligence

09/06/2019 – 10/07/2019 Belo Horizonte, Brazil
VISITING FACULTY DCC | DEPARTAMENTO DE CIÊNCIA DA COMPUTAÇÃO - UFMG UNIVERSIDADE FEDERAL DE MINAS GERAIS

Visiting professor under the grant "- *From Measurements to Smarter Cities: Learning Global Mobility Patterns, Users' Interests and Behaviors from the Network to Support Smarter Cities"* - Founded by Compagnia di San Paolo - "Progetti congiunti di ricerca con università prestigiose"

14/06/2017 – 15/07/2017 San Jose, United States
VISITING PROFESSOR CISCO SYSTEM

Collaboration on Cybersecurity topics to design novel solutions to secure DNS systems using Machine learning approaches
Business or sector Computer Networks, Cybersecurity, Artificial Intelligence

06/07/2011 – 07/09/2011 Sunnyvale, Italy
VISITING PROFESSOR NARUS INC

Collaboration on Cybersecurity topics to design novel solutions based on Big Data solutions
Business or sector Computer Networks, Cybersecurity, Artificial Intelligence

13/06/2012 – 14/08/2012 Sunnyvale, United States
VISITING PROFESSOR NARUS INC

Collaboration on Cybersecurity topics to design novel solution based on Big Data solutions. Business or sector Computer Network, Cybersecurity, Artificial Intelligence

30/09/2014 – 14/03/2019 Torino, Italy
ASSOCIATE PROFESSOR POLITECNICO DI TORINO

Electronics and Telecommunications Department Topics: Computer Networks, Big Data, Cybersecurity, Machine Learning, Privacy. Business or sector Education and research

31/03/2001 – 29/09/2014 Torino, Italy
ASSISTANT PROFESSOR POLITECNICO DI TORINO

Electronics and Telecommunications Department. Topics: Computer Networks, System Performance, Network Monitoring. Business or sector Education and research

- **EDUCATION AND TRAINING**

31/10/1997 – 12/02/2001 Torino, Italy
PHD IN ELECTRONICS AND TELECOMMUNICATIONS ENGINEERING Politecnico di Torino

Address Corso Duca degli Abruzzi 24, Torino, Italy | **Website** www.polito.it

31/10/1990 – 11/02/1997 Torino, Italy
LAUREA ELECTRONICS AND TELECOMMUNICATIONS ENGINEERING – 110 WITH LAUDEM Politecnico di Torino

Address Corso Duca degli Abruzzi 24, Torino, Italy

- **ADDITIONAL INFORMATION**

PUBLICATIONS

Google Scholar profile – 2023
According to Google Scholar, by May 2023, the H-index is 56 and the total citation frequency is above 13000; In recent 5 years, the total citation frequency is above 4900. Recent key journal articles are as follows:

When satellite is all you have: watching the internet from 550 ms – 2022
Daniel Perdices, Gianluca Perna, Martino Trevisan, Danilo Giordano, and Marco Mellia. 2022. When satellite is all you have: watching the internet from 550 ms. In Proceedings of the 22nd ACM Internet Measurement Conference (IMC '22). Association for Computing Machinery, New York, NY, USA, 137–150. https://doi.org/10.1145/3517745.3561432

DarkVec: automatic analysis of darknet traffic with word embeddings – 2021
Luca Gioacchini, Luca Vassio, Marco Mellia, Idilio Drago, Zied Ben Houidi, and Dario Rossi. 2021. DarkVec: automatic analysis of darknet traffic with word embeddings. In Proceedings of the 17th International Conference on emerging Networking EXperiments and Technologies (CoNEXT '21). Association for Computing Machinery, New York, NY, USA, 76–89

Five years at the edge: Watching internet from the isp network – 2020
M. Trevisan, D. Giordano, I. Drago, M. M. Munafò and M. Mellia, "Five Years at the Edge: Watching Internet From the ISP Network," in *IEEE/ACM Transactions on Networking*, vol. 28, no. 2, pp. 561-574, April 2020

Does domain name encryption increase users' privacy? – 2020

Martino Trevisan, Francesca Soro, Marco Mellia, Idilio Drago, and Ricardo Morla. 2020. Does domain name encryption increase users' privacy? SIGCOMM Comput. Commun. Rev. 50, 3 (July 2020), 16–22.

Unveiling web fingerprinting in the wild via code mining and machine learning – 2020

Rizzo, Valentino, Traverso, Stefano and Mellia, Marco. "Unveiling Web Fingerprinting in the Wild Via Code Mining and Machine Learning" Proceedings on Privacy Enhancing Technologies, vol.2021, no.1, 2021, pp. 43-63.

Traffic Analysis with Off-the-Shelf Hardware: Challenges and Lessons Learned – 2017

M. Trevisan, A. Finamore, M. Mellia, M. Munafo and D. Rossi, "Traffic Analysis with Off-the-Shelf Hardware: Challenges and Lessons Learned," in *IEEE Communications Magazine*, vol. 55, no. 3, pp. 163-169, March 2017

PROJECTS

01/02/2023 – CURRENT
Protect-IT - imPROving The rEsilience to Cyberattacks of distributed ICT InfrastrucTures Principal investigator of the PROTECT-IT project funded withing the PE7 - SERICS. PROTECT-IT addresses the issues related to existing network-based security solutions that are inadequate to face increasing cyberattacks, to design and build a novel distributed platform leveraging AI-ML and policy-based enforcement solutions that can automatically identify new threats and deploy immediate autonomous cybersecurity countermeasures even in critical scenarios.

01/09/2022 – CURRENT
ICSC - National Research Centre for High Performance Computing, Big Data and Quantum Computing The Centre carries out Research and Development activities, at national and international level, for innovation in the field of simulations, computing and analysis of high-performance data.

30/11/2019 – CURRENT
H2020 PIMCity project "Building the next generation personal data platforms" Coordinator of the **H20 20 PIMCity project** "**Building the next generation personal data platforms"**, funded by the European Commission in 2019, with more than 6MEuros and involving 13 partners. The project aims at developing novel solutions to untangle the current model based on users data collection and exploitation in the internet, bringing back to users the power to control their online information. https://www.pimcity-h2020.eu

30/09/2014 – CURRENT
SmartData@PoliTo interdipartimental center Coordinator of the SmartData@PoliTo interdipartimental center, funded by Politecnico di Torino in 2017 with more than 2.6MEuros to create a multidisciplinary center on Big Data, Machine Learning, Artificial Intelligence fundamentals and applications to multiple applications scenarios. More than 80 professors, researchers an PhD Students collaborate with the center and with PhD students working on Big Data, Data Science and Machine Learning applications. Total Funding collected up tp 2020 about 7MEuros. https://smartdata.polito.it

2018 – 2020
HPC4AI (Centro di Competenza Calcolo ad Alte Prestazioni e Intelligenza Artificiale Torino) Coordinat or of the HPC4AI (Centro di Competenza Calcolo ad Alte Prestazioni e Intelligenza Artificiale Torino), funded by Regione Piemonte with 1.5MEuros for Politecnico to build an open HPC and Big Data cluster for machine learning and artificial intelligence applications. https://hpc4ai.it

31/07/2015 – 30/07/2018
H2020 Fire Project "MONROE - Measuring Mobile Broadband Networks in Europe" Principal Investigator ("responsabile scientifico") of the H2020 Fire Project "MONROE - Measuring Mobile Broadband Networks in Europe", funded by the European Commission in 2015 with about 6.5MEuros to build a large scale and flexible testbed for experimental research in 3G/4G mobile networks. https://www.monroe-project.eu

2015 – 2018
"BIG-DAMA" - BIG DATA ANALYTICS FOR NETWORK TRAFFIC MONITORING AND ANALYSIS Principal Investigator ("responsabile scientifico") of the "BIG-DAMA" - BIG DATA ANALYTICS FOR NETWORK TRAFFIC MONITORING AND ANALYSIS funded by the WWTF of Vienna in 2016 with 1 MEuros for investigating novel big data approaches for traffic monitoring. https://bigdama.ait.ac.at

2012 – 2015
FP7 Integrated Project (IP) "mPlane – an Intelligent Measurement Plane for Future Network and Application Management" Project Coordinator of the FP7 Integrated Project (IP) "mPlane – an

Intelligent Measurement Plane for Future Network and Application Management", funded by the European Commission in 2013, with more than 11MEuros to build a scalable, open, distributed infrastructure for internet monitoring. https://www.ict-mplane.eu

2008 – 2011
FP7 Strep "Napa-Wine - Network Aware Peer-to-peer Application over Wise Networks" Technical Coordinator of the FP7 Strep "Napa-Wine - Network Aware Peer-to-peer **Application over Wise Networks"**, funded by the European Commission in 2008 with 5.5 MEuros, to develop peer-to-peer video streaming solutions that cooperate with the network to reduce the load and improve quality.

2013 – 2014
"Narus Cyber Innovation Center" (NCIC) Director of "Narus Cyber Innovation Center" (NCIC) in Italy, a laboratory hosted in Politecnico di Torino and funded in 2014 with more than 1 MUSD by Narus Inc., Sunnyvale, CA, a wholly owned subsidiary of the Boeing Company, leader in the Cybersecurity area, to develop novel solution for traffic monitoring and cybersecurity.

HONOURS AND AWARDS

31/12/2020
IEEE Fellow – IEEE Elevated to IEEE Fellow effective January 1st 2021, with the following citation: " for contributions to Internet traffic analysis".

11/2012
Applied Networking Research Prize 2012 - IETF-88 – Internet Research Task Force Idilio Drago, Marco Mellia, Maurizio M. Munafo, Anna Sperotto, Ramin Sadre and Aiko Pras. Inside Dropbox: Understanding Personal Cloud Storage Services. Proc. ACM Internet Measurement Conference (IMC), Boston, MA, USA, November 2012.

Other My works and my students have been awarded the **Best Paper at ITC 2018**, **Best PhD dissertation** GTTI Award for PhD Theses in the field of Communication Technologies, winner of the **Applied Networking Research Prize 2017**, **Best ACM CCR** paper 2016 (invited for presentation at SIGCOMM 2016), **Best Demo Award IEEE WOWMOM** 2016, **Best Student Paper at ITC** 2015, **Best Paper award at IEEE ICDCS** 2015, **Best Paper award at IEEE TRAC** 2015, **Best Paper award at ACM CoNEXT** 2013, **Best Paper award at IEEE Peer to Peer** 2012, and winner of the **IRTF Applied Networking Research Prize** in 2013.
For six years in a row, from 2006 to 2011, I won the **prize "Giovani Ricercatori"** ("Young Assistant Professor") assigned by Politecnico di Torino to the top 30 Assistant Professors (among more than about 300 Assistant Professors).

NETWORKS AND MEMBERSHIPS

2004 – CURRENT
ACM member and IEEE Member I'm currently serving as **Editor in Chief** of the Proceeding of the ACM on Networking (**PACMNET**). In the past, I served as a member of the **Editorial Board** of ACM Computer Communication Review (**ACM CCR**), IEEE Transactions of Networks and Service Management (**IEEE TNSM**), and Elsevier Computer Networks (**COMNET**). I've organized special issues of Journals and served as a reviewer for the most prestigious journals in my area. I served as **Steering Committee member of ACM CoNEXT**, and in the past of IEEE/IFIP Network Traffic Measurement and Analysis Conference (**TMA**). I was a Member of the ACM SIGCOMM Doctoral Dissertation Award Committee. I chaired conferences, and workshops, organized PhD Schools and tutored several PhD students, who are now all working in top universities or companies in the ICT field. I served as **TPC member** of more than 60 conferences, including **ACM SIGCOMM, ACM IMC, ACM CoNEXT, ACM SAC, IEEE INFOCOM, IEEE ICC, IEEE GLOBECOM**.

RESEARCH INTEREST

Research directions

My research interests lie in the **area of Computer and Communication Networks**. Over the years, I have covered several application domains dealing with computer and communication networks, and with **Internet traffic characterization, classification, cyber security and Internet privacy,** in particular. I'm deeply involved in **traffic measurement and characterization** activities involving networks and the Internet in particular. I'm currently working on Big Data and Machine Learning applications for traffic analysis to ultimately **shed light on the obscure dynamics of the Internet**. Applied **to cyber security**, the diversity of the attacks, and their stealthy nature mandates the design of a new generation of tools, algorithms, and methodologies for the automatic identification of malware, and threats in general. I strongly believe that automatic approaches must be designed to i) identify privacy threats, and ii) design protection mechanisms that are able to automatically adapt to ever-changing situations and attacks. The amount of data to be

processed calls data mining and machine learning techniques to automatically produce knowledge. I'm proud to be the coordinator of the **SmartData@PoliTo inter-department centre,** where colleagues, students and researchers from different areas collaborate to set up a novel big data and data science centre in Politecnico. The centre extends the big data and machine learning-based approaches to other domains, among which Intelligent Transport Systems in Smart Cities, Predictive Maintenance for automotive and energy applications, and Quality of Service in next-generation networks.

More recently, I started working on **online privacy where** I am now working on developing technologies to offer internet users and companies solutions to get back control of the information they share, **bringing transparency** to the online data collection market. The H2020 PIMCity projects I'm coordinating aim at offering a development kit to let anyone experiment with new solutions in this area.

PATENTS

13 patents

I hold **13 patents** in the area of traffic monitoring and analysis, and of Cybersecurity. Complete list here.

INDUSTRIAL COLLABORATIONS

Collaborations

I am collaborating and collaborated with several companies in the past, including Huawei Technologies, Narus Inc, Cisco Systems, Telefonica, Alcatel Lucent, NEC, Telecom Italia, Vodafone, Fastweb, Tierra Telematics, ENEL, General Motors to name a few.