Marco Cello

Research Fellow, Nokia Bell Labs

CONTACT INFORMATION

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Personal Page | Bell Labs Page

Google Scholar | LinkedIn | Research Gate

SHORT BIO

I am a Researcher and Engineer with 8 years of experience in academic research and managing of research projects funded by national industries, the European Commission and the European Space Agency. I got my Ph.D. from the University of Genoa in 2012. In 2013 I was Post-Doc research fellow at NYU Polytechnic School of Engineering and Visiting Research Fellow at New York University Abu Dhabi. Currently I am a Research Fellow at Nokia Bell Labs (Dublin, Ireland) in the Application Platforms & Software Systems Research Lab.

I have experience in managing people and drive research activities. For 2 years, at the University of Genoa, I coordinated with my advisor - on a daily basis - the scientific activity of 3 PhD students and Master students of our laboratory. Since 2009, I am co-advisor and supervisor of PhD, Master and Bachelor students, supporting the work of almost 30 students.

I have proficient programming skills in C/C++ and Python and an in-depth knowledge in Linux-based emulation of telecommunication networks, IP networking technologies, SDN, L2 to L4 forwarding, QoS, traffic engineering and routing protocols. Moreover, I have a strong background on Markov chains, queuing theory, linear/nonlinear optimization and dynamic programming.

RESEARCH INTERESTS[1]

My current research focuses on **Serverless Architectures** and **Container-Based Cloud Infrastructures**, where I apply my knowledge of optimization, queuing theory and technical experience in programming and Linux networking in order to make such platforms highly elastic, efficient and self-adaptive. I am also interested in online modelling and understanding of **VM-Based Cloud Services**. I extensively worked in the past on **Software Defined Networking (SDN)** focusing on the problem of dynamically partition the network in a multi-controller scenario and on QoS aspects. I have also experience in Call Admission Control (CAC) and Delay Tolerant Networking (DTN) for sensor and nanosatellite networks.

PROFESSIONAL AND ACADEMIC EXPERIENCE

Research Fellow **Feb 2016 – Present**
Nokia Bell Labs, Dublin, Ireland

I am part of the Application Platforms & Software Systems Research Lab. (Scientific Coordinator Dr. Volker Hilt) and I am working on internal projects[2] about Serverless Architectures [P1] and Container-Based Cloud Infrastructures [C14]. I am focusing on modelling/algorithmic aspects, as well as, simulation issues. Such projects involve many researchers and part of my job is the coordination with them.

1 Research statements available on request.

2 Most of the activities are covered by Intellectual Propriety, so I cannot expose much of the details.

I am also involved in mentoring activities of PhD students.

Post-Doc Research Fellow **Mar 2014 – Feb 2016**
University of Genoa, Genova, Italy

I was member of the SCNL lab. (scientific coordinator Prof. Mario Marchese). My research focused on SDN and DTN Nanosatellite networks. On SDN I extensively worked on the problem of SDN multicontroller scenario with Prof. Yang Xu (NYU) and Dr. Anwar Walid (Nokia Bell Labs), I developed BALCONcontroller [SW6] a northbound application for a popular SDN controller and my research has been published in [C13]; I also worked on the QoS applied to SDN, publishing [J9][J10]. On Nanosatellite networks we worked on the problem of gateway and satellite selections. By doing so, we reimplemented DTN on NS3 [SW5] and we published in [C7] [C9]. I also was in charge to coordinate the research activities of SCNL, proposing new research topics and mentoring our 2 PhD students and almost 10 Master and Bachelor students [Appendix]. Finally, I worked on a Italian project on SDN aspects [PLUGIN].

Post-Doc Research Fellow **Feb 2013 – Feb 2014**
NYU Polytechnic School of Engineering, New York, USA

I was member of the High-Speed Networking Laboratory, ECE Department (scientific Coordinator: Prof. H. Jonathan Chao). In this period I had the possibility to broaden the range of the networking topics, studying the literature about data centre architecture, their traffic engineering approaches and SDN. I got a true expertise in finding interesting and novel research problems. I published a work on VM migration [C6]. In the meantime I was also Visiting Research Fellow at NYU Abu Dhabi.

Visiting Research Fellow **May 2013 – Jan 2014**
New York University Abu Dhabi, Abu Dhabi, UAE

Post-Doc Research Fellow **Jan 2012 – Dec 2012**
University of Genoa, Genova, Italy

I was member of the SCNL lab. (scientific coordinator Prof. Mario Marchese). I continued the research activities I was working during my Ph.D. In particular we studied optimality conditions and structural properties for CAC policies with an arbitrary number of classes in [J4][J7]. Regarding DTN, in [J2] we proposed an analytical framework to study node buffer occupancy through batch-arrivals/batch-services queuing models and in [J6], we proposed a model to compute the average packet delivery time in a challenging network comparing the performance of two paradigms: IP-like and DTN paradigm. I was also advisor in several thesis [Appendix].

Ph.D. Student **Jan 2009 – Dec 2011**
University of Genoa, Genova, Italy

I was member of the SCNL lab. (scientific coordinator Prof. Mario Marchese). During my Ph.D., I worked on two research topics: CAC and DTN. In CAC we extended "The Stochastic Knapsack Problem" paper to non-linear feasibility regions [C2]. Our solution permits, under some conditions, to find the shape and the parameters of the optimal admission control policy, to be applied in the telecommunication network/system, having an arbitrary objective function and number of classes/users. If the conditions are not satisfied, we give an algorithmic solution able to improve the current CAC policy [J1]. On DTN we worked mainly on EU/ESA funded projects [SATNEXIII1][SATNEXIII2], publishing the most interesting work in [J5].

Research Fellow **Jun 2008 – Dec 2008**
University of Genoa, Genova, Italy

Internship **Jun 2005**
S.I.R. Soluzioni in Rete s.r.l, Genova, Italy

Working in a local SME, I installed and configured the software Asterisk: a PBX software with VoIP functionality and setup a small testbed with several functionalities. This work was part of my Bachelor Thesis [T1].

EDUCATION

Doctor of Philosophy in Telecommunications Engineering **Apr 2012**
University of Genoa, Genova, Italy

Title: "Study and Performance Evaluation of Coordinate-Convex Policies in Call Admission Control" [T3]
Advisor: Prof. Mario Marchese
Topics: Admission control policies, QoS approaches in networks, operation research

Professional Engineering Qualification **Jan 2010**
University of Genoa, Genova, Italy

Master of Science in Telecommunications Engineering **May 2008**
University of Genoa, Genova, Italy

Final Grade: full marks (110/110) and summa cum laude
Title: "Control Routing Strategies in Interplanetary Networks" [T2]
Advisors: Prof. Mario Marchese, Prof. Fabio Lavagetto
Topics: routing for space networks, architectures for networks, digital communications, mathematical methods and operations research, radiocommunications systems, electromagnetic propagation.

PUBLICATIONS

Patents

[P1[**M. Cello**, J. Omana Iglesias, D. Lugones, "Resource Allocation in a Cloud Environment:, US Patent Appl. No. 15/447665, filed 2 March 2017 (pending).

Journals

[J11] L. Boero, **M. Cello**, M. Marchese, E. Mariconti, T. Naqash, S. Zappatore, "*Statistical Fingerprint – Based Intrusion Detection System (SF-IDS)*", **International Journal of Communication System (IJCS)**, article in press, 2016.

[J10] L. Boero, **M. Cello**, C. Garibotto, M. Marchese, M. Mongelli, "*BeaQoS: Quality of Service and Load Balancing Support in OpenFlow Environment*", **Elsevier Computer Networks**, 2016.

[J9] **M. Cello**, M. Marchese, M. Mongelli, "*On the Loss Estimation in a OpenFlow Network*", **IEEE Communications Letters**, vol. 20, no. 3, pp. 554-557, Mar 2016.

[J8] Z. Guo, Y. Xu, **M. Cello**, J. Zhang, Z. Wang, M. Liu, H. J. Chao, "*JumpFlow: Reducing Flow Table Usages in Software-Defined Networks*", Elsevier Computer Networks, vol. 92, part 2, pp. 300–315, Dec 2015.

[J7] **M. Cello**, G. Gnecco, M. Marchese, M. Sanguineti, "*Narrowing the Search for Optimal Call-Admission Policies Via a Nonlinear Stochastic Knapsack Model*", Journal of Optimization Theory and Applications, Vol.164, No.3, Pages 819-841, 2015.

[J6] **M. Cello**, G. Gnecco, M. Marchese, M. Sanguineti, "*Evaluation of the Average Packet Delivery Delay in Highly-Disrupted Networks: The DTN and IP-like Protocol Cases*", IEEE Communications Letters, Vol.18, No.3, Pages 519-522, March 2014.

[J5] C. Caini, R. Firrincieli, T. de Cola, I. Bisio, **M. Cello**, G. Acar, "*Mars to Earth Communications through Orbiters: DTN Performance Analysis*", International Journal of Satellite Communications and Networking, Vol.32, No.2, Pages 127–140, March 2014.

[J4] **M. Cello**, G. Gnecco, M. Marchese, M. Sanguineti, "*Optimality conditions for coordinate-convex policies in*

CAC with nonlinear feasibility boundaries", IEEE Transaction on Networking, Vol.21, No.5, Pages 1363-1377, October 2013.

[J3] **M. Cello**, et. al., "*A Survey of Architectures and Scenarios in Satellite-based Wireless Sensor Networks: System Design Aspects*", International Journal of Satellite Communications and Networking, Vol.31, No.1, Pages 1-38, January/February 2013.

[J2] **M. Cello**, G. Gnecco, M. Marchese, M. Sanguineti, "*A Model of Buffer Occupancy for ICNs*", IEEE Communications Letters, Vol.16, No.6, Pages 862-865, June 2012.

[J1] **M. Cello**, G. Gnecco, M. Marchese, M. Sanguineti, "*CAC with nonlinearly-constrained feasibility regions*", IEEE Communications Letters, Vol.15, No.4, Pages 467-469, April 2011.

Conference Proceedings

[C14] J. Bravo Ferreira, **M. Cello**, J. Omana Iglesias, "More Sharing, More Benefits? A Study of Library Sharing in Container-Based Infrastructures", International European Conference on Parallel and Distributed Computing (Euro-Par) , 2017.

[C13] **M. Cello**, Y. Xu, A. Walid, G. Wilfong, H. J. Chao, M. Marchese, "*BalCon: A Distributed Elastic SDN Control via Efficient Switch Migration*", IEEE International Conference on Cloud Engineering (IC2E) 2017.

[C12] **M. Cello**, M. Marchese, F. Patrone, "ColdSel: A Selection Algorithm to mitigate congestion situations and reduce satellite buffer occupancies in DTN-Nanosatellite Networks", IEEE Global Communications Conference 2016, GLOBECOM 2016, Washington DC, USA, 2016.

[C11] **M. Cello**, M. Marchese, F. Patrone, "SatSel: A Satellite Selection Algorithm to Reduce Delivery Time in DTN-Nanosatellite Networks for Internet Access in Rural Areas", 2016 8th Advanced Satellite Multimedia Systems Conference and the 14th Signal Processing for Space Communications Workshop (ASMS/SPSC).

[C10] M. Mongelli, T. De Cola, **M. Cello**, M. Marchese, F. Davoli, "Feeder-Link Outage Prediction Algorithms for SDN-based High-Throughput Satellite Systems", IEEE International Conference on Communications 2016, ICC 2016, Kuala Lumpur, Malaysia.

[C9] **M. Cello**, M. Marchese, F. Patrone, "HotSel: A Hot Spot Selection Algorithm for Internet Access in Rural Areas through Nanosatellite Networks", Proc. IEEE Global Communications Conference 2015, GLOBECOM 2015, San Diego, USA.

[C8] L. Boero, **M. Cello**, C. Garibotto, M. Marchese, M. Mongelli, "Management of Non-Conformant Traffic in OpenFlow Environments", International Symposium on Performance Evaluation of Computer and Telecommunication Systems (SPECTS), 2015.

[C7] **M. Cello**, M. Marchese, F. Patrone, "Hotspot Selection in Nanosatellite DTN Networks", Ninth ACM MobiCom Workshop on Challenged Networks (CHANTS), 2014.

[C6] **M. Cello**, M. Marchese, K. Xi, H. J. Chao , "Traffic-Aware Clustering and VM Migration in Distributed Data Center ", ACM SIGCOMM Workshop on Distributed Cloud Computing (DCC), 2014 (poster paper).

[C5] **M. Cello**, T. De Cola, M. Marchese, M. Mongelli, "QoS and QoE Evaluation of Web-browsing Over an SI-SAP-Enabled DVB-S2/RCS System", European Conference on Networks and Communications (EUCNC), 2014.

[C4] **M. Cello**, G. Gnecco, M. Marchese, M. Sanguineti, "An Application to Two-Hop Forwarding of a Model of Buffer Occupancy in ICNs", IEEE System of Systems Engineering (SoSE), 2012.

[C3] **M. Cello**, G. Gnecco, M. Marchese, M. Sanguineti, "A Generalized Stochastic Knapsack Problem with Application in Call Admission Control", 10-th Cologne-Twente Workshop on graphs and combinatorial optimization, CTW2011, Frascati, June 14-16, 2011.

[C2] **M. Cello**, G. Gnecco, M. Marchese, M. Sanguineti, "Structural Properties of Optimal Coordinate-Convex Policies for CAC with Nonlinearly-Constrained Feasibility Regions", Proc. IEEE International Conference on Computer Communications, INFOCOM 2011, Mini conference, 10-15 Apr. 2011, Shanghai, China.

[C1] I. Bisio, **M. Cello**, T. de Cola, M. Marchese, "Combined Congestion Control and Link Selection Strategies for Delay Tolerant Interplanetary Networks", Proc. IEEE Global Communications Conference, GLOBECOM 2009, 30 Nov.- 4 Dec. 2009, Honolulu, HI, USA.

Book Chapters

[B1] **M. Cello**, C. Degano, M. Marchese, F. Podda, "*Smart Transportation Systems in Critical Conditions*", Book Chapter of "Smart Cities and Homes: Key Enabling Technologies", Morgan Kaufmann, Chapter 14, pp. 291-322, 2016.

Abstracts

[A7] M. Sanguineti, **M. Cello**, G. Gnecco, M. Marchese, "Forwarding Strategies for Congestion Control in Intermittently Connected Networks", 20th Conference of the International Federation of Operational Research Societies, IFORS, 13-18 July, 2014, Barcelona, Spain.

[A6] M. Cello, G. Gnecco, M. Marchese, M. Sanguineti, "Average Packet Delivery Delay in Intermittently-Connected Networks", in 44th Annual Conference of the Italian Operational Research Society, AIRO 2014, 2-5 Sept. 2014, Como, Italy.

[A5] M. Sanguineti, **M. Cello**, G. Gnecco, M. Marchese, "Optimality Conditions for Coordinate-Convex Policies in Call Admission Control via a Generalized Stochastic Knapsack Model", 26th European Conference on Operational Research, XXVI EURO - INFORMS, 1-4 July, 2013, Rome, Italy.

[A4] **M. Cello**, A. Cignoni, M. Marchese, "Evaluation of Delay/Disruptive Tolerant Network (DTN) Solutions in Networks under Intentional Attack", NATO CAX Forum 2012, Rome.

[A3] **M. Cello**, G. Gnecco, M. Marchese, M. Sanguineti, "Optimality conditions for a nonlinear stochastic knapsack problem", XLIII Annual Conf. of the Italian Operations Research Society (AIRO), 2012.

[A2] **M. Cello**, G. Gnecco, M. Marchese, M. Sanguineti, "A stochastic knapsack problem with nonlinear capacity constraint", XLII Annual Conf. of the Italian Operations Research Society (AIRO), 2011.

[A1] **M. Cello**, G. Gnecco, M. Marchese, M. Sanguineti, "On call admission control with nonlinearly constrained feasibility regions", 24th European Conference on Operational Research, EURO2010, July 2010, Lisbon, Portugal.

Thesis

[T3] **M. Cello**, "Study and Performance Evaluation of Coordinate-Convex Policies in Call Admission Control", PhD Thesis, April 2012.

[T2] **M. Cello**, M. Corradi, "Strategie per il controllo dell'instradamento in reti interplanetarie", Master Thesis (in Italian), May 2008.

[T1] **M. Cello**, "Progetto per la realizzazione di un centralino integrato VoIP su piattaforma Linux", Bachelor Thesis (in Italian), December 2005.

SOFTWARE[3]

[SW6] **BALCONController**
Complete implementation of a northbound application into RYU controller that also implements the algorithm for load balancing using switches migration (BALCONController). It use OF 1.3 and below and it can run on multiple instances on different hosts/networks. It implements the inter-controller messaging through sockets and a custom application protocol (avoiding the use of a shared/centralized database). The controllers can exchanges themselves many kind of information, like: traffic update, switch migration information, and so on. Each controller implements the switch migration procedure that guarantees liveness and safety for each switch migration. It fully implements the BALCON algorithm: the algorithm aimed at balancing the controller load through switch migration.

[SW5] **Re-implementation DTN module for NS3**
Complete re-implementation of DTN module for NS3 in C++. The module is able to simulate a network with DTN nodes which have a complete DTN protocol stack and communicate with each other taking advantage of the functionalities offered by DTN paradigm. The module is also able to dynamically manage the opening and closing of the sockets, the HotSel implementation (the DTN research activity) and custody transfer.

[SW4] **CACsim**
Implementation of an event-driven simulator in C++ (CACsim) able to simulate the arrival and departure of connections in a system using custom and regular stochastic processes. CACsim implements also the most common CAC policies as well as the policies developed during the CAC research activity. The software has been used to verify the good performances of our CAC policies.

[SW3] **DTN-IP**
Implementation of an event-driven simulator in C++ (DTN-IP) able to simulate the behavior of an IP packet transmission and a DTN bundle transmission on a path affected by opportunistic contacts among nodes. The software has been used to verify the good performances of DTN protocol in opportunistic scenarios.

[SW2] **Re-implementation DTN module for NS2**
Complete re-implementation of DTN module for NS2 in C++

[SW1] **DTN module for Opportunistic Network Environment simulator (ONE)**
Complete re-implementation of DTN module for ONE in Java

CONFERENCE SERVICES

TPC Member

ACM CHANTS 2017, 2016, 2015
EW 2014
IEEE GLOBECOM 2017, 2016, 2010
ICST PSATS 2013, 2012

Local Arrangement

IEEE ICDCS 2010

Local Organizing Chair

ICST PSATS 2014

3 *More details and code available on request.*

Session Chair

IEEE SPECTS 2012

EDITORIAL ACTIVITIES

Reviewer for the following Journal & Magazine papers

IEEE Transactions on Networking, IEEE Transactions on Communications, IEEE Transactions on Wireless Communications, IEEE Wireless Communications Magazine, IEEE Journal on Selected Areas in Communications, IEEE Communications Letters, IEEE Aerospace and Electronic Systems Magazine, EURASIP Journal on Wireless Communications and Networking, Wiley International Journal of Communication Systems (IJCS), IEEE Journal of Communications and Networks (JCN), Elsevier Computer Networks, Academy Publisher Journal of Networks (JNW), Hindawi Journal of Computer Networks and Communications.

Reviewer for the following Conference papers

ACM CHANTS 2017-2015 EW 2014, IEEE ICC 2017-2009, IEEE GLOBECOM 2016-2008, ICST PSATS 2015-2011, IEEE M&N 2013, ICORES 2013, IEEE VTC 2013, IEEE VNC 2011, IEEE IWCMC 2011, IEEE ISWPC 2010, SASN 2009, IEEE PIMRC 2009, IEEE CAMAD 2009.

PROJECTS

Scientific participation in national (MIUR) and international research (ESA, EU) projects eligible for funding on the basis of competitive tenders involving peer review.

[PLUGIN] **PLUG-IN – Platform for Urban Mobility with Management of Information from Heterogeneous Sources** **Mar 2014 – Feb 2016**

Funded by Italian Ministry of Education, Universities and Research (MIUR) within Ligurian Technological District (SIIT), the local project leader was Prof. Mario Marchese. I contributed to the preparation of the technical proposal participation in meetings, and the associated research.

[SATNEXIII2] **The Satellite Communications Network of Excellence SatNEx III – Call of Order 2** **Apr 2011 – May 2012**

Funded by European Space Agency (ESA) within the ARTES program, the local project leader were Prof. Franco Davoli and Prof. Mario Marchese. I contributed in the participation in meetings, the research associated, and the preparation of the technical documentation.

https://artes.esa.int/projects/satnex-iii

[ETSIBSM] **Emulator for an ETSI BSM-Compliant SI-SAP Interface** **May 2009 – Jun 2011**

Funded by European Space Agency (ESA) within the ARTES 5 program, the local project leader was Prof. Mario Marchese. I contributed in the preparation of the technical documentation, extensive performance evaluation and final testing phases.

https://artes.esa.int/projects/emulator-etsi-bsm-compliant-si-sap-interface

[SATNEXIII1] **The Satellite Communications Network of Excellence SatNEx III – Call of Order 1** **Mar 2010 – Mar 2011**

Funded by European Space Agency (ESA) within the ARTES program, the local project leader were Prof. Franco Davoli and Prof. Mario Marchese. I contributed in the participation in meetings, the research associated, and the preparation of the technical documentation.

https://artes.esa.int/projects/satnex-iii

[SLIMCOMM] **slimCOMM - Telecommunication system for port areas** **2009-2012**

Funded under the program INDUSTRY 2015 by the Ministry of Economic Development, the local project leader was Prof. Mario Marchese. I contributed to the preparation of the technical and financial proposal

[QAAS] **QaaS-Quality as a Service: Towards a QoS-aware Multi-Tenant Datacenter** [Not Funded] **Feb-Apr 2014**

I was the project creator and unique contributor of the project proposal for Scientific Independence of young Researchers, Ministry of Education, University and Research, Italy.

[UNITED] **UNITED: Towards a unified theoretical framework for routing and congestion control in DTN** [Not Funded] **Jun-Aug 2012**

I was the project creator and unique contributor of the project proposal for Marie Curie Actions - International Outgoing Fellowships (IOF), European Union.

INDUSTRIAL COOPERATIONS

[SELEXLTE] **Access technologies based on LTE** **Jul 2012 – June 2013**

This projects was a research contract between the University of Genoa and a national-level company Selex-Elsag S.p.A., the local project leader was Prof. Mario Marchese. I contributed in the research and technical aspects of the project.

[AMGC] **Smarter Network** **Dec 2012**

This project was a research contract between the University of Genoa and AM General Contractor S.p.A., the local project leader was Prof. Sandro Zappatore. I contributed to the preparation of the technical documentation.

COLLABORATIONS

Research/technical activities and projects preparation during the Master Thesis, Ph.D and Post-Doc periods at University of Genoa

Prof. Mario Marchese (University of Genoa, Italy)
Prof. Franco Davoli (University of Genoa, Italy)
Prof. Igor Bisio (University of Genoa, Italy)
Prof. Sandro Zappatore (University of Genoa, Italy)
Prof. Marcello Sanguineti (University of Genoa, Italy)
Prof. Giorgio Gnecco (IMT Lucca, Italy)
Dr. Maurizio Mongelli (National Research Council – CNR, Italy)

Research activities during the Post-Doc and Visiting research period at NYU

Prof. H. Jonathan Chao (NYU, USA)
Prof. Kang Xi (NYU, USA)

Research activities on SDN

Prof. Yang Xu (NYU, USA)
Dr. Anwar Walid (Nokia Bell Labs, USA)
Dr. Gordon Wilfong (Nokia Bell Labs, USA)
Dr. Zehua Guo (Tsinghua University, China)

Activities related to the preparation of the technical documentation and simulation/emulation phases for the project [SATNEXIII1]

Prof. Carlo Caini (University of Bologna, Italy)
Dr. Rosario Firrincieli (University of Bologna, Italy)

Activities related to the preparation of the technical documentation for the project [SATNEXIII2]

Prof. Athanasios D. Panagopoulos (National Technical University of Athens, Greece)
Dr. Tomaso De Cola (German Aerospace Center – DLR, Germany)
Dr. Alberto Gotta (National Research Council – CNR, Italy)

Preparation of the project proposal [UNITED]

Eng. Scott Burleigh (Jet Propulsion Laboratory - JPL, USA)

Activities related to the preparation of the technical documentation for the project [[SELEXLTE]

Eng. Roberto Agrone (Selex-ES, Italy)
Eng. Luca Spinacci (Selex-ES, Italy)

Activities related to the preparation of the technical and financial proposal of [SLIMCOMM]

Eng. Alessandro Garibbo (Selex-ES, Italy)
Eng. Paolo Collimedaglia (Selex Communciations, Italy)

TEACHING AND ACADEMIC ACTIVITIES

Co-Advisor of Ph.D., Master, and Bachelor degree theses **2009 – 2016**
University of Genoa, Faculty of Engineering, Italy

Member of the examination board during the final examination **2011 – 2012**
University of Genoa, Faculty of Engineering, Italy

Classes: Telecommunication Networks (B.Sc. in Telecommunication Eng.), Computer Networks (B.Sc. in Electronic Eng.), Telematics and Internet Technologies (B.Sc. in Electronic and Information Technologies Eng.)

Assistance during the final examination **2008 – 2016**
University of Genoa, Faculty of Engineering, Italy

Classes: Telecommunications Networks 1 (B.Sc. in Telecommunication Eng.), Telecommunication Networks (B.Sc. in Telecommunication Eng.), Telecommunications Networks 2 (M.Sc. in Telecommunication Eng.), Advanced Architectures and Applications for Communication Networks 1 (M.Sc. in Telecommunication Eng.), Advanced Architectures and Applications for Telecommunications Networks (M.Sc. in Multimedia Signal Processing and Telecommunications Networks)

Lecturer **2009 – 2012**
Interforce Military Telecommunications School, STELMILIT, Chiavari, Italy

Course of Network Systems Administration and ICT Security
Linux Networking Tools (ping, tcptrace, netcat), iptables, 14 hours

Course of Network Systems Administration and ICT Security
IP, TCP/UDP, Encryption, IPSEC, MPLS, VPN, 14 hours

Course of Network Systems Administration
Security, Encryption, Hashing, IP, IPSEC, MPLS, VPN, 14 hours

Course of Network Systems Administration and ICT Security
IP, TCP/UDP, Encryption, IPSEC, MPLS, VPN, 14 hours

Course of Linux Advanced Administration
Samba, 7 hours

Course of ICT for Structured Cabling Systems
DNS, DHCP and Security, 10 hours

SCHOLARSHIPS

Research grant from Fondazione Banca Carige **2012**

Ph.D. Fellowship from Italian Ministry of Education, Universities and Research (MIUR) **2009 – 2011**

LANGUAGES

Italian

Mother tongue

English

Cambridge English First Certificate in English (FCE), University of Cambridge, January 2011
Listening Comprehension B2, Reading Comprehension B2, Spoken Interaction B2, Spoken Production Oral B2, Written Production B2.

TECHNICAL KNOWLEDGES

Data-Center and Cloud Platforms

Good knowledge of datacenter networking solutions (e.g. architectures, protocols), virtualization concepts (e.g. containers, VMs) and the principal paradigm (e.g. serverless, PaaS, IaaS).

Computer networks

In-depth knowledge of IP networking technologies, SDN, NFV, L2 to L4 forwarding, QoS, Traffic Engineering, network monitoring, routing protocols and algorithms.

Satellite and Space communications

Good knowledge of satellite and space communications with particular attention to the transmission problems in deep space environment. Good knowledge of principal protocol solution used in this scenario, likes the CCSDS (The Consultative Committee for Space Data Systems) and the DTN architecture.

Computer security

Good knowledge about cryptography and cryptography protocols, symmetric-key/public-key cryptography. Knowledge about typical problems and security flaws of the principal protocol on TCP/IP stack (DNS poisoning attack), security protocols (IPSEC).

SOFTWARE AND PROGRAMMING SKILLS

Programming languages

Depth knowledge of C++ (object oriented or procedural code programming)
Good knowledge of C, Python, Tcl, Bash
Knowledge of Java

Operating systems

In-depth knowledge of GNU/Linux operating systems (installation, configuration, and maintenance) in particular those based on Debian and Slackware

Good knowledge about Microsoft operating systems

Scientific software

Very good knowledge of Matlab, Mathematica, NS2, NS3, ONE, Latex, wyswyg software
Basic knowledge about Orcad and Circad for electronic designs

System administrator

Deep knowledge of network tools in GNU/Linux operating systems (Linux Traffic Control, netem, NIST Net, iptables, etc..)
Very good knowledge in configuration and administration of DNS, DHCP server, HTTP server (Apache), mailing-list (Mailman), print services (CUPS, LPD), files and resources sharing (Samba), CMS (Plone, Joomla, etc)

POST-GRADUATE FORMATION

"Mobile Computing and Communications: Towards the Next Generation of Networks" **Jul 2010**
Prof. Ian F. Akyildiz, Prof. Alex Arenas, Prof. Jon Crowcroft, Prof. Paolo Santi
Lipari School on Computer Science, Lipari, Italy

"Hardware architecture of networking switches" **May 2009**
Dr. Thomas Edsall
University of Pisa, Pisa, Italy

"Game Theory" **May 2009**
Prof. Fioravante Patrone
University of Genoa, Italy.

"Integration, stochastic differential equations and applications" **May 2009**
Prof. Ottavio Calligaris
University of Genoa, Italy

"Introduction to functional analysis" **Mar 2009**
Prof. Tullio Zolezzi
University of Genoa, Italy.

"4th Satnex Summer School" **Jul 2008**
Prof. Marco Luise, Maria Angeles Vazquez Castro, Petia Todorova, Stefano Chessa
National Research Council, Pisa, Italy

AFFILIATIONS AND MEMBERSHIPS

Member **Jan 2012 - Dec 2014**
Institute of Electrical and Electronics Engineers (IEEE) and
IEEE Communications Society

Student Member **Jan 2009 - Dec 2011**
Institute of Electrical and Electronics Engineers (IEEE) and
IEEE Communications Society

Affiliate member **Jun 2008 - present**
National Inter-University Consortium for Telecommunications (CNIT), Italy

REFEREES[4]

PERSONAL INFORMATION

Born: July 20 1983 in Savona, Italy
Residing: 3 Surehaven Road, Phoenix Park Racecourse, Dublin 15, Republic of Ireland
Citizenship: Italian

Dublin, April 16th 2017

4 Referees available on demand.

APPENDIX

CO-ADVISOR MASTER DEGREE THESIS

Name & Surname	Course	Year	Thesis Title
Laxman Koirala	M.Sc in Multimedia Signal Processing And Telecommunication Networks, University of Genoa	2015	Performance evaluation of SDN virtual switching and Routing
Giovanni Guido Erick Reichstein	M.Sc in Multimedia Signal Processing And Telecommunication Networks, University of Genoa	2015	Sandbox-based and SDN-based Malware Detection and Behavioural Analysis
Karim Badawi Marwan Fayad	M.Sc in Multimedia Signal Processing And Telecommunication Networks, University of Genoa	2015	Analysis of Solutions for SDN Security and Authentication
Luca Boero, Chiara Garibotto	M.Sc in Multimedia Signal Processing And Telecommunication Networks, University of Genoa	2014	Analysis, Development and Performance Evaluation of QoS Support in the OpenFlow Protocol for SDN Environments
Valerio Salerno Angelica Bertucci	M.Sc in Telecommunication Eng., University of Genoa	2012	Algorithms for Classification of Traffic Botnet: Analysis, Study and Performance Evaluations
Federico Clazzer Francesco Comaschi	Institute of Advanced Studies in Information Technology and Communication (ISCT), University of Genoa	2011	Remote Monitoring and Control of Operating Parameters of Vessels in Ocean Navigation
Stefano Vecchi	M.Sc in Telecommunication Eng., University of Genoa	2009	Study, Simulation and Performance Evaluation of a Peer-to-Peer Information Distribution and Recovery Architecture

CO-ADVISOR BACHELOR DEGREE THESIS

Name & Surname	Course	Year	Thesis Title
Francesco Bigotto	B.Sc in Telecommunication Eng., University of Genoa	2015	Load Balancing in SDN Multicontroller: Analysis and Performance Evaluation of Switches' Migration Solutions
Paolo Limo Camilla Musso	B.Sc in Telecommunication Eng., University of Genoa	2014	Study and Analysis of Cyberattacks in a Honeypot System Using Principal Component Analysis
Luca Boero Chiara Garibotto	B.Sc in Telecommunication Eng., University of Genoa	2012	Routing Algorithms and Congestion Control for Intermittently Connected Networks: Simulator Development and Performance Evaluation

Hassan Zaher	B.Sc in Telecommunication Eng., University of Genoa	2012	Visualization and Analysis of Data Related to Attacks Measured by Honeypot
Fabio Patrone	B.Sc in Telecommunication Eng., University of Genoa	2010	Study and Performance Evaluation Solutions for Peer-to-Peer Networks
Federica Bisio	B.Sc in Telecommunication Eng., University of Genoa	2010	Strategies for Routing and Congestion Control in DTN Interplanetary Networks

SUPERVISOR PH.D CANDIDATES

Name & Surname	**Course**	**Cycle**	**Advisor**	**Research Subject**
Fabio Patrone	Science and Technology for Electronic and Telecommunications Engineering	XXIX - 2014	Prof. Mario Marchese	Protocols and Algorithms Optimization Over Delay and Disruption Tolerant Space Networks
Luca Boero	Science and Technology for Electronic and Telecommunications Engineering	XXXI - 2016	Prof. Mario Marchese	Quality of Service in SDN Networks.
Talha Naqash	Science and Technology for Electronic and Telecommunications Engineering	XXIX- 2014	Prof. Mario Marchese Prof. Simona Sacone	Security Aspects in SDN Networks.

SUPERVISOR MASTER & BACHELOR DEGREE THESIS

Name & Surname	**Course**	**Year**	**Thesis Title**
Alberto Candia	M.Sc in Telecommunication Eng., University of Genoa	2015	Algorithms to Minimize the Delivery Time over DTN-based Nanosatellite Networks
Margherita Stefanini	M.Sc in Telecommunication Eng., University of Genoa	2015	Opportunistic and Dynamic Intersatellite Routing over a Nanosatellite-DTN Network
Giorgio Iaquinti Matteo Morando	B.Sc in Telecommunication Eng., University of Genoa	2013	Quality of Service Scheduling Algorithms for LTE Systems: Design and Performance Analysis
Antonio Litterio	M.Sc. in Electronic Eng., University of Genoa	2010	Distributed Emulation of Satellite IP Interfaces Under the ETSI SI-SAP Standard: Requirements, Implementation and Performance Evaluation of Computational Effort

Angelica Bertucci Andrea Mazzu'	B.Sc in Telecommunication Eng., University of Genoa	2010	Simulative Analysis of Variants of the Rapid Spanning Tree Protocol for Fast Fault Recovery in Ethernet Ring Networks
Elisabetta Fuiano	B.Sc in Telecommunication Eng., University of Genoa	2009	Study and Performance Analysis of the Optimal Balance Between Distortion and Energy Consumption in Wireless Sensor Gaussian Networks
Paolo Musso	M.Sc in Telecommunication Eng., University of Genoa	2009	Study and Emulative/Simulative Analysis of IP Multimedia Subsystem

SUPERVISOR PH.D INTERNSHIP

Name & Surname	**Course**	**Year**	**Thesis Title**
Jose' Frederico Bravo Ferreira	Ph.D Student at Princeton University	2016	Library Sharing in Container-Based Infrastracture