



# Saverio Mascolo

Date of birth:

Nationality:

Gender:

## CONTACT



## WORK EXPERIENCE

01/11/1995 – CURRENT – Bari, Italy

### Professor of Automatic Control (professore ordinario)

Politecnico di Bari

Teaching Feedback Control, Control Methods for Computer Networks, Model Predictive Control

Academic research and teaching (ERC sector: PE7 Systems and Communication Engineering)

01/09/2015 – 30/09/2021 – Bari, Italy

### Head of the Department of Electrical Engineering and Information Science

Politecnico di Bari

01/10/2015 – 30/09/2021 – Bari, Italy

### Member of the Academic Senate of Politecnico di Bari

Politecnico di Bari

10/09/1999 – 30/08/2000 – Los Angeles, United States

### Visiting researcher

University of California at Los Angeles

2001 – 2006 – Uppsala, Sweden

### External Academic consultant

Uppsala University

2000 – CURRENT – Bari, Italy

### Scientific Coordinator and founder of the "Control of computing and communication systems Lab (C3lab)"

Politecnico di Bari

2021 – CURRENT – Bari, Italy

### Scientific Coordinator and founder of the teaching laboratory "Mobile robot and embedded control (Mobirec)"

Politecnico di Bari

01/10/2021 – CURRENT – Bari, Italy

### Coordinator of the MSc course in Automation Engineering

Politecnico di Bari

## EDUCATION AND TRAINING

10/1991 – 12/1994 – Bari, Italy

## Ph.D

Politecnico di Bari

**Address** Via Orabona 4, c/o Dipartimento di Ingegneria Elettrica ed Elettronica, Politecnico di Bari, Bari, Italy | **Web site** [www.poliba.it](http://www.poliba.it)

01/1995 – 06/1996 – Los Angeles, United States

## Post-doc Visiting scholar

University of California at Los Angeles

**Address** Computer Science Department Boelter Hall, Los Angeles, United States | **Website** [www.cs.ucla.edu](http://www.cs.ucla.edu)

## PROJECTS

### Industrializzazione brevetti “Brevetti+”

Progetto del MISE gestito da Invitalia, Avviso pubblico, G.U. n. 179 del 03/08/2011.

### “Guida assistita ed autonoma di carrelli elevatori”

Committente GRUPPO FARAONE.

2020 – 2022

### “Monitoraggio Attivo dell’Infrastruttura (MAIA)”

Progetto finanziato dal MISE (2020-2022), PON R&I 2014-2020.

2019 – 2022

### SESAME (Smart European Space Access thru Modern Exploitation of Data Science)

The project aims at improving European launchers’ manufacturing and operations through digital technologies, processes and methods. SESAME will provide the European Launcher Industry with a framework aims at achieving cost reduction through improved production and operation effectiveness, reduction of Cost of Non-Quality, improved working environment and operator’s safety. Funded by EU H2020.

01/11/2021 – 29/10/2022

### PAMELA (Piattaforme mobili elevabili ad alta guidabilità)

Principal investigator. Funded Project: € 384,400. Funded by MISE- Meditech.

01/07/2018 – 30/04/2022

### FURTHER (FUTURE Rivoluzionarie Tecnologie per velivoli più Elettrici)

Progetto di Ricerca Industriale e Sviluppo Sperimentale, area di specializzazione “Aerospazio”, codice identificativo ARS01\_01283, dal titolo “FURTHER - FUTURE Rivoluzionarie Tecnologie per velivoli più Elettrici”. Budget Poliba: 1.521.567,50.

2016 – 2020

### ATENA (Advanced Tools to assess and mitigate the criticality of ICT components and their dependencies over Critical Infrastructure)

The project will produce a set of tools that, implementing innovative models, methodologies and algorithms for security assurance, and interacting with the available smart components of a CI, will increase the level of cyber-physical security and resilience of underpinning CI & IACS. Funded by EU H2020.

2017 – 2020

### CLIPS “a Cloud-based platform for Immersive adaptive video Streaming”

Principal Investigator. Funded budget: € 1,7M.

Bando “HORIZON 2020” PON I&C 2014-2020, D.M. 1 giugno 2016

2015 – 2018

### BONVOYAGE “From Bilbao to Oslo, intermodal mobility solutions and interfaces for people and goods, supported by an innovative communication network”

The project aims at designing, developing and testing a platform optimizing **multimodal** door-to-door transport of passengers and goods. European Union's Horizon 2020 research and innovation program under grant agreement No 635867.

01/01/2014 – 31/12/2016

### T-NOVA (Network function as a service over virtualized networks)

An Integrated Project co-funded by the European Commission / 7<sup>th</sup> Framework Programme, aiming at designing and implementing an integrated management architecture, including an Orchestrator platform, for the automated provision, management, monitoring and optimization of Virtualised Network Functions over Network/IT infrastructures. Grant Agreement no. 619520. Collaborator

2014 – 2016

### MAIVISTO "Massive Adaptive Video Streaming over the Internet Using the Cloud"

Principal Investigator. Funded budget: € 963K

2012 – 2015

### Res Novae (Reti, Edifici, Strade – Nuovi obiettivi virtuosi per l'ambiente e l'energia)

Funded by **Italian University Minister**.

2012 – 2015

### PLATINO "PLATform for INNOvative services in future internet"

Principal Investigator at the research unit of Politecnico di Bari. Funded by **Italian University Minister** (2012-2015). Project budget €7M. Funded budget at the research unit €1,1M

2014

### Google Faculty Award 2014 per la ricerca "Congestion control for WebRTC"

Control of congestion and delay in real-time communications.

03/2013

### CISCO Research Award (CG #574954)

Assegnato da Fondo "Cisco-University Research Program", amministrato dalla Fondazione americana "Silicon Valley Community", per la ricerca dal titolo: "Architecture for Robust and Efficient Control of Dynamic Adaptive Video Streaming over HTTP".

2008 – 2009

### "Distribuzione audio/video su IP"

Finanziato dalla società Financial Tradeware plc di Roma.

2006 – 2008

### "Traffic Engineering and QoS Control in Multimedia-enabled Wireless Networks"

**Azione COST 290**. S. Mascolo è rappresentante dell'Italia nel Management Committee dell'azione.

2005 – 2006

### FAMOUS (Fluid Analitic Models Of aUtonomic Systems)

**Progetto PRIN, codice: 2005093971**. S. Mascolo è responsabile dell'Unità di ricerca del Politecnico di Bari aggregata all'Unità del Politecnico di Torino.

2005 – 2006

### Progetto "TCP su reti wireless"

Finanziato dalla società Financial Tradeware srl di Roma.

2002 – 2006

### Progetto "Wireless IP"

Finanziato dalla Swedish Strategic Research Initiative.

Il progetto coinvolge le Università svedesi di Uppsala, Goeteborg, Lund e Chalmers.

01/01/1999 – 31/12/2004

### Complex Interactive Networks/Systems

**EPRI and DDR&E**, through the Army Research Office (see page 104, Control Systems, vol. 19, no. 6, Dec. 1999). The initiative was a 5 year, \$30 million Government Industry Collaborative University Research effort to develop revolutionary concepts for operating complex and interconnected networks such as the electric power grid, telecommunications, transportation, banking, and finance infrastructure. Six university consortia were selected in a highly competitive process (CalTech, UCLA, UCSB, MIT, U. of Illinois U-C). S. Mascolo was in charge to coordinate the research efforts of Departments of Electrical Engineering (Prof. Paganini) and Computer Science (Prof. M. Gerla)

2001 – 2003

### “Traffic models and Algorithms for Next Generation IP networks Optimization” (TANGO)

Progetto FIRB. S. Mascolo è responsabile scientifico dell’Unità di ricerca del Politecnico di Bari. Nell’ambito di tale progetto è stata realizzata interamente al Politecnico di Bari la progettazione e l’implementazione nel kernel di Linux del controllo di congestione denominato Westwood+ TCP. Tale implementazione fa parte della distribuzione ufficiale di Linux a partire dal kernel 2.6.

1998 – 2000

### “Control Methods for ATM congestion control”

Finanziato dalla National Science Foundation. Saverio Mascolo è stato co-PI del progetto presso l’Università della California a Los Angeles. Tale progetto è stato presentato in seguito alle ricerche svolte da Mascolo negli anni 95-96 in cui per la prima volta sono state applicate le metodologie dei controlli automatici al controllo del traffico nelle reti ATM.

## HONOURS AND AWARDS

2018

### IEEE Fellow

IEEE Fellow for "contributions to modeling and control of congestion in packet networks"

2014

### Google Faculty Award – Google US

for the research entitled "Congestion Control for Web Real-Time Communication (WebRTC)"

2013

### Cisco Academy Research Award – Cisco US

"Architecture for Robust and Efficient Control of Dynamic Adaptive Video Streaming over HTTP" (CG #574954)

## EDITORIAL ACTIVITY

01/2008 – 12/2012

### Associate Editor of the IEEE Transactions on Automatic Control

04/2016 – CURRENT

### Associate Editor of the IEEE/ACM Transactions on Networking

01/2008 – CURRENT

### Associate Editor of the Computer Networks Journal, Elsevier

2003 – 2018

### Associate Editor of the IEEE Control Systems Conference Editorial Board

## PATENTS

### End-to-end bandwidth estimation for congestion control in packet switching networks

United States patent 7130268 granted Oct. 31 2006.

Inventor: S. Mascolo

### METHOD AND APPARATUS FOR TCP WITH FASTER RECOVERY

**United States patent 7299280** granted nov. 2007

Title: Inventors: S. Mascolo, C. Casetti, M. Gerla, M. Senadidi, S. Lee

### **Rate based congestion control for packet networks**

**United States Patent 7593335** granted on **Sept. 22, 2009**

Inventor: S. Mascolo,

### **Actuator for implementing rate-based packet sending over packet switching networks**

**United States patent nr. 7916637** granted **march 29, 2011**

Inventors: Luca De Cicco and Saverio Mascolo

### **Controlling Player Buffer and Video Encoder for Adaptive Video Streaming**

**United States Patent nr. 2015/014677, 8** granted **dec 27, 2016**

Inventors: Luca De Cicco and Saverio Mascolo.

## SELECTED PUBLICATION LIST RELEVANT FOR THE PROJECT

2022

### **Optimal QoE-fair Resource Allocation in Multi-Path Video Delivery Networks**

Gioacchino Manfredi, Luca De Cicco, Saverio Mascolo, *IEEE Transactions on Network and Service Management*, 2022

05/2020

### **A DASH 360° Immersive Video Streaming Control System**

G. Ribezzo, L. De Cicco, V. Palmisano, S. Mascolo, *Internet Technology Letters*, Wiley, May 2020, DOI: 10.1002/itl2.175

06/2019

### **Reducing the Network Bandwidth Requirements for 360° Immersive Video Streaming**

L. De Cicco, S. Mascolo, V. Palmisano, G. Ribezzo, *Internet Technology Letters*, Wiley, e118, doi: 10.1002/itl2.118, June, 2019

01/06/2019

### **QoE-driven Resource Allocation for Massive Video Distribution**

Luca De Cicco, Saverio Mascolo, Vittorio Palmisano, *Ad Hoc Networks*, Elsevier, vol. 89, pp. 170-176, 1 June, 2019

03/2018

### **Modeling and Design of Adaptive Video Streaming Control Systems**

Giuseppe Cofano, Luca De Cicco, Saverio Mascolo, *IEEE Transactions on Control of Network Systems*, vol. 5, no. 1, pp. 548-559, doi: 10.1109/TCNS.2016.2631452, March 2018;

2017

### **Congestion Control for WebRTC: Standardization Status and Open Issues**

L. De Cicco, G. Carlucci, and S. Mascolo, *IEEE Communications Standards Magazine*, Feature topic 'Real Time Communications in the Web', vol. 1, no. 2, pp. 22-27, 2017, doi: 10.1109/MCOMSTD.2017.1700014

10/2017

### **Congestion Control for Web Real-Time Communication**

G. Carlucci, L. De Cicco, S. Holmer, and S. Mascolo, *IEEE/ACM Transactions on Networking*, vol. 25, no. 5, pp. 2629-2642, Oct. 2017.

03/2017

### **Design and Experimental Evaluation of Network-assisted Control Strategies for HTTP Adaptive Video Streaming**

G. Cofano, L. De Cicco, T. Zinner, A. Nguyen-Ngoc, P. Tran-Gia, and S. Mascolo, *ACM Transactions on Multimedia Computing, Communications, and Applications (TOMM)*, March 2017

08/2016

### **A Hybrid Model of the Akamai Adaptive Streaming Control System**

L. De Cicco, G. Cofano, and S. Mascolo, *Nonlinear Analysis: Hybrid Systems, Special Issue da 'IFAC World Congress 2014'*, Elsevier, Volume 21, Pages 139-154, DOI 10.1016/j.nahs.2015.12.007, August 2016

07/2016

● **Controlling Queuing Delays for Real-Time Communication: Interplay of E2E and AQM Algorithms**

G. Carlucci, L. De Cicco, and S. Mascolo, *ACM SIGCOMM Computer Communication Review*, July 2016

09/2015

● **Local SIP Overload Control: Controller Design and Optimization by Extremum Seeking**

L. De Cicco, G. Cofano, and S. Mascolo, *IEEE Transactions on Control of Network Systems*, Vol. 2, Issue 3, pp. 267-277, Sept. 2015

04/2014

● **An Adaptive Video Streaming Control System: Modeling, Validation, and Performance Evaluation**

L. De Cicco and S. Mascolo, *IEEE/ACM Transaction on Networking*, Volume 22, Issue 2, April 2014

04/2014

● **An Adaptive Video Streaming Control System: Modelling, Validation, and Performance Evaluation**

L. De Cicco and S. Mascolo, *IEEE/ACM Transactions on Networking*, in Volume 22, Issue 2, April 2014 ([PDF](#))

2011

● **Skype Video Congestion Control: an Experimental Investigation**

L. De Cicco, S. Mascolo, V. Palmisano, *Computer Networks, Elsevier*, vol. 55, n.3, pp. 558-571, 2011

08/2011

● **Robust Stability Analysis of Smith Predictor-based Congestion Control Algorithms for Computer Networks**

L. De Cicco, S. Mascolo, S.-I. Niculescu, *Automatica, Elsevier*, vol. 47, issue 8, pp. 1685-1692, August, 2011.

03/2010

● **A Mathematical Model of the Skype VoIP Congestion Control Algorithm**

L. De Cicco, Saverio Mascolo, *IEEE Trans. on Automatic Control*, vol. 55, n. 3, pp. 790-795, Mar 2010. **IF 3.293**

04/2007

● **Feedback-based Control for Providing Real-time Services with the 802.11e MAC**

G. Boggia, P. Camarda, L. A. Grieco, Saverio Mascolo, *IEEE/ACM Trans. on Networking*, vol.15, no.2, pp. 323-333, April 2007. **(Regular paper). IF 1.831.**

04/2006

● **Modeling the Internet congestion control using a Smith controller with input shaping**

Saverio Mascolo, *Control Engineering Practice*, vol. 14, Issue 4, pp. 425-435, April 2006, Elsevier. **(Regular paper). IF 1.263.**

2005

● **A Congestion Control Algorithm for the Deep Space Internet**

L. A. Grieco, Saverio Mascolo, *Space Communications*, An International Journal, Special Issue on Satellite Network Protocols, Volume 20, Number 3/4, 2005, pp. 155-160. **(Regular paper). IF. 0.250.**

01/2005

● **Mathematical analysis of Westwood+ TCP congestion control**

L. A. Grieco and S. Mascolo, *IEE PROCEEDINGS-CONTROL THEORY AND APPLICATIONS*, vol. 152, no.1, pp. 35-42, Jan 2005. **(Regular paper). IF 1.045.**

10/2004

● **A Control Theoretical Approach to Congestion Control in Packet Networks**

D. Cavendish, M. Gerla, S. Mascolo, **IEEE/ACM Transactions on Networking**, vol. 12, no. 5, pp. 893-906, October 2004. (Regular paper). IF 1.789.

06/2004

### Adaptive Rate Control for Streaming Flows over the Internet

L.A. Grieco, S. Mascolo, **ACM Multimedia Systems Journal**, vol. 9, no. 6, pp. 517 – 532, June 2004, Springer-Verlag. (Regular paper). IF 0.438.

04/2004

### Performance Evaluation and Comparison of Westwood+, New Reno, and Vegas TCP Congestion Control

L. A. Grieco, S. Mascolo, **ACM Computer Communication Review**, vol. 34, no. 2, pp. 25-38, April 2004. (Regular paper). IF 0.578.

04/03/2004

### Intraprotocol Fairness and Interprotocol Friendliness of the TFRC Congestion Control Algorithm

L. A. Grieco, S. Mascolo, **IEE Electronics Letters**, 4th March 2004, vol. 40, no. 5. IF 1.063.

01/2004

### Performance evaluation of Westwood+ TCP congestion control

S. Mascolo, L. A. Grieco, R. ferorelli, P. camarda , G. piscitelli, **Performance Evaluation**, 55 (2004), pp. 93-111, *Special Issue with Selected papers from Golbecom 02*, Elsevier, North-Holland, January 2004. (Regular paper). IF 0.694.

15/08/2003 – 15/08/2003

### Dead-time and Feed-forward Disturbance Compensation for Congestion Control in Data Networks

S. Mascolo, **International Journal on System Science**, Special Issue on: Time Delay Systems for Communication Networks, vol. 34, no. 10-11, pp. 627-639, 15 Aug-15 Sept. 2003, Taylor and Francis Group. (Regular paper). IF 0.492.

12/2002

### Generalized Window Advertising for TCP Congestion Control

M. Gerla, R. Locigno, S. Mascolo, W. Weng, **European Transactions on Telecommunications**, vol. 13, no. 6, pp. 549-562, Nov/Dec. 2002. (Regular paper). IF 0.236.

09/2002

### TCP Westwood: end-to-end bandwidth estimation for enhanced transport over wireless links

C. Casetti, M. Gerla, S. Mascolo, M. Sanadidi, R. Wang, **ACM Wireless Networks**, *Special issue with Extended Versions of selected papers from Mobicom 2001*, vol. 8, no. 5, pp.467-479, Sept. 2002. Springer Netherlands. (Regular paper). (Il paper pubblicato a Mobicom è citato 378 volte). IF 1.350.

02/2000

### Smith's Principle for Congestion Control in High Speed Data Networks

S. Mascolo, **IEEE Trans. on Automatic Control**, vol. 45, no. 2, pp. 358-364, Feb 2000. (Technical Note). IF 1.553.

12/1999

### Congestion control in high-speed communication networks using the Smith principle

S. Mascolo, **Automatica**, vol. 35, no. 12, Dec. 1999, pp. 1921-1935. Special Issue on "Control methods for communication networks". Eds. VenkatAnantharam, Jean Walrand (Regular paper). IF 1.449.

11/1997

### ATM Rate Based Congestion Control Using a Smith Predictor

S. Mascolo, D. Cavendish, M. Gerla, **Performance Evaluation**, *Special Issue on "ATM Traffic Control"*, vol. 31, no. 1-2, Nov. 1997, pp. 51-65, Elsevier. (Si tratta della versione estesa del lavoro pubblicato alla conferenza Infocom 1996 citato 80 volte). (Regular paper). IF 0.593.

## Bibliometric indices

h-index = 44

g-index = 91

papers: 279

citations: 8829

Source: scholar google on 18/09/2022

## TECHNOLOGY TRANSFER

2009 - CURRENT

### Founder of Quavlive srl

A Multimedia streaming and videoconferencing company. Active since 2014.

## DICHIARAZIONE

### DICHIARAZIONE

#### DICHIARAZIONI SOSTITUTIVE DI CERTIFICAZIONI

(art. 46 del D.P.R. n. 445/2000)

#### DICHIARAZIONI SOSTITUTIVE DELL'ATTO DI NOTORIETA'

(art. 47 del D.P.R. n. 445/2000)

COGNOME MASCOLO

NOME Saverio

CODICE FISCALE MSCSVR66C01A662I,

NATO A BARI PROV. BA

IL 1 marzo 1966 ;

ATTUALMENTE RESIDENTE A BARI

*consapevole che chiunque rilascia dichiarazioni mendaci, forma atti falsi o ne fa uso è punito ai sensi del codice penale e delle leggi speciali in materia,*

DICHIARA

che quanto riportato nel presente Curriculum Vitae et Studiorum corrisponde al vero.

Dichiara inoltre di essere informato, ai sensi e per gli effetti di cui al D.Lgs 196/2003 che i dati personali raccolti saranno trattati, anche con strumenti informatici, esclusivamente nell'ambito del procedimento per il quale le presenti dichiarazioni vengono rese.

(\*) Autentica omessa ai sensi del c. 11 dell'art. 2 della L. 191/98

(Si allega fotocopia del documento di identità)

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"According to law 679/2016 of the Regulation of the European Parliament of 27th April 2016, I hereby express my consent to process and use my data provided in this CV."