

Luca De Cicco, Ing., PhD

Politecnico di Bari
Dipartimento di Ingegneria Elettrica e
dell'Informazione
Via Re David, 200
Bari, Italia, 70125
(39) 080 596 38 51
l.decicco@poliba.it
<http://c3lab.poliba.it/index.php/LDC:Home>

CURRENT POSITION	Researcher at Politecnico di Bari working on the research theme “Multimedia content distribution over the Internet by using cloud computing infrastructures” and visiting at LINCSE Paris Tech, Paris, France
BIBLIOMETRIC INDICES	<ul style="list-style-type: none">◇ Google Scholar: H-Index: 7 Citations: 269◇ Scopus: H-Index: 6 Citations: 104
MAIN CONTRIBUTIONS	<ul style="list-style-type: none">◇ Research in the field of time-delay systems with application to telecommunication and computing systems.◇ Robust control of time-delay systems with applications to computer networks.◇ Hybrid modelling of two relevant Internet applications: Skype congestion control – the most popular videoconference software – and video quality automatic control system of the Akamai adaptive-streaming platform (CDN worldwide leader).◇ Design, implementation, and experimental evaluation of pre-industrial prototypes in the context of audio/video flow transport over the Internet (see Patents and Technology transfer sections).◇ Research collaboration with Google in the context of the IETF WG RMCAT and RTCWEB. Topic: congestion control for real-time communication
RESEARCH INTERESTS	Adaptive Live Video Streaming, TCP Congestion Control, Multimedia Congestion Control, tools for automatic network measurement, CPU overload control, SIP Overload Control, Time delay systems, Hybrid Modelling
EDUCATION	<ul style="list-style-type: none">◇ Politecnico di Bari, Bari, Italy. <i>Ph.D.</i> Dipartimento di Elettrotecnica ed Elettronica, Politecnico di Bari (Italy), Advisor: Prof. Saverio Mascolo (TCP Westwood+ inventor), July 2008 Title of the thesis: <i>Modeling, design and implementation issues in Multimedia Congestion Control Algorithms</i>. <i>MSc. Computer Science Engineering</i> graduated cum laude, Politecnico di Bari (Italy), Advisors: Prof. P. Camarda, Prof. S. Mascolo, Eng. L.A. Grieco, December 2003 Dissertation: <i>Congestion Control Algorithms for Multimedia Applications</i>.
VISITING POSITIONS	<ul style="list-style-type: none">◇ Ecole Supérieure d'Electricité' (Supelec), Paris, France. Advisor: Prof. Silviu Iulian Niculescu. Subject of the research: time-delay systems modelling for adaptive streaming applications.

- RESEARCH PROJECTS

- ◇ **University of New Mexico**, Albuquerque, NM, USA, ECE Department. Advisor: Prof. Chaouki Abdallah
Subect of the research: In the context of the NSF funded project FIND (Future INternet Design) he had the opportunity to address mobility issues in networking and new Internet paradigms (Persistent Identifiers).
 - ◇ **Ecole Supérieure d'Electricité' (Supelec)**, Paris, France. Advisor: Prof. Silviu Iulian Niculescu.
Subject of the research: stability analysis of systems affected by two independent time delays
 - ◇ *Platform for Innovative Service for the Future Internet (PLATINO) PON R&C (2012-2015)*. Role: coordinator and responsible for a working package
 - ◇ *Architecture for Robust and Efficient Control of Dynamic Adaptive Video Streaming over HTTP*. Role: contributor, funded by "Cisco University Research Program" fund of the Silicon Valley Community Foundation
 - ◇ *Telecommunication Facilities and Wireless Sensor Networks in Emergency Management*, strategic Project, funded by Apulia Region. Role: contributor
 - ◇ *Future Internet Design (FIND)*. Advisor: Prof. Chaouki Abdallah (University of New Mexico), funded by National Science Foundation.
 - ◇ *Traffic and QoS management in Wireless Multimedia Networks* , COST 290 action, contributor, 2006-2007
 - ◇ *Fluid Analytical Models Of aUtonomic Systems (FAMOUS)*, MIUR-PRIN project no. 2005093971, 2005-2006
 - ◇ *End-to-End protocols for audio/video over Internet protocol*, 2005-2006, funded by Financial Tradeware plc, Rome
 - ◇ *End-to-end protocols for video over IP*, 2007-2008, privately funded by Financial Tradeware plc, Rome
 - ◇ *Implementation and measurement of congestion control protocols over GPRS and UMTS networks*, 2004. Advisors: Prof. Saverio Mascolo (Politecnico di Bari), Prof. Marco Ajmone Marsan (Politecnico di Torino).
- JOURNALS

- ◇ Luca De Cicco and S. Mascolo, "An Adaptive Video Streaming Control System: Modelling, Validation, and Performance Evaluation", *IEEE/ACM Transaction on Networking*, in press
 - ◇ Luca De Cicco, S. Mascolo, "A Mathematical Model of the Skype VoIP Congestion Control Algorithm", *in IEEE Transactions on Automatic Control*, vol. 55, n. 3, pp 790-795, Mar 2010 (Impact factor 2008: 3.293)
 - ◇ Luca De Cicco, S. Mascolo, S.-I. Niculescu, "Robust Stability Analysis of Smith Predictor-based Congestion Control Algorithms for Computer Networks", *in Automatica, Elsevier, vol. 47, issue 8, pp. Pages 1685-1692, Aug. 2011*, (Impact factor 2009: 3.178)
 - ◇ Luca De Cicco, S. Mascolo, V. Palmisano, "Skype Video Congestion Control: an Experimental Investigation", *Computer Networks, Elsevier*, vol. 55, issue 3, pp. 558-571, Feb. 2011
- INTERNATIONAL CONFERENCES

- ◇ L. De Cicco, G. Cofano, and S. Mascolo, "A Hybrid Model of the Akamai Adaptive Streaming Control System", *IFAC World Congress 2014*, Cape Town, South Africa, 24-29 August 2014
 - ◇ L. De Cicco, G. Carlucci, and S. Mascolo, "Understanding the Dynamic Behaviour of the Google Congestion Control", *Proc. of Packet Video Workshop 2013*, San Jose, CA, USA, Dec 2013
 - ◇ L. De Cicco, V. Caldaralo, V. Palmisano, and S. Mascolo, "ELASTIC: a Client-side Controller for Dynamic Adaptive Streaming over HTTP (DASH)", *Proc. of Packet Video Workshop 2013*, San Jose, CA, USA, Dec 2013
 - ◇ L. De Cicco, G. Cofano, and S. Mascolo, "Local SIP Overload Control: Controller Design and Optimization by Extremum Seeking", *Proc. of IEEE CDC 2013, Firenze, Italy*, Dec 2013

- ◇ L. De Cicco, G. Carlucci, and S. Mascolo, "Experimental Investigation of the Google Congestion Control for Real-Time Flows", *Proc. of ACM SIGCOMM 2013 Workshop on Future Human-Centric Multimedia Networking*, Aug 2013
- ◇ Luca De Cicco, G. Cofano, and S. Mascolo, "Local SIP Overload Control", *Proc. of WWIC 2013*, S. Petersburg, Russia, June, 2013
- ◇ S. Alfredsson, G. Del Giudice, J. Garcia, A. Brunstrom, Luca De Cicco, S. Mascolo, "Impact of TCP Congestion Control on Bufferbloat in Cellular Networks", *Proc. of. 14th IEEE International Symposium on a World of Wireless, Mobile and Multimedia Networks*, Madrid, Spain, 4-7 June 2013
- ◇ Luca De Cicco, S. Mascolo, and D. Calamita, "A Resource Allocation Controller for Cloud-based Adaptive Video Streaming", in *Proc of IEEE ICC'13 - 1st International Workshop on Mobile Cloud Networking and Services (MCN)*, Budapest, Hungary, June, 2013
- ◇ Luca De Cicco, S. Mascolo and C. Abdallah, "An Experimental Evaluation of Akamai Adaptive Video Streaming over HSDPA networks", in *Proc. of IEEE Multi-Conference on Systems and Control 2011 (Invited CACSD-SU Session 'Computing and Control')*, Denver, CO, USA, September 28-30, 2011
- ◇ Luca De Cicco, S. Mascolo, V. Palmisano, "Feedback Control for Adaptive Live Video Streaming", in *Proc. of ACM Multimedia Systems Conference 2011, special session on Modern Media Transport*, San Jose, California, USA, Feb 2011
- ◇ Luca De Cicco, S. Mascolo, "An Experimental Investigation of the Akamai Adaptive Video Streaming", in *Proc. of USAB 2010*, pp. 447-464, Klagenfurt, Austria, Nov. 2010
- ◇ Luca De Cicco and S. Mascolo, "A Mismatch Controller for Implementing High-Speed Rate-based Transport Protocols", in *Proc. of 17th IEEE International Conference on Network Protocols (ICNP '09)*, Princeton, NJ, USA, Oct. 13-16, 2009 (Acceptance rate: 18%)
- ◇ Luca De Cicco, S. Mascolo, S-I Niculescu, "Robust Stability Analysis of a Class of Smith Predictor-based Congestion Control Algorithms for Computer Networks", in *Proc. of IFAC 8th Workshop of Time delay Systems (TDS '09)*, Sinaia, Romania, Sept 1-3, 2009
- ◇ Luca De Cicco, Saverio Mascolo, Vittorio Palmisano, "A Mathematical Model of the Skype VoIP Congestion Control Algorithm", in *Proc. of IEEE Conference on Decision and Control*, Cancun, Mexico, Dec 2008
- ◇ Luca De Cicco and S. Mascolo, "Book Title: 'Traffic and QoS Management in Wireless Multimedia Networks'", Contribution to the Chapter on Packet scheduling and Congestion Control, COST 290 Final Report, 2009, Springer Verlag, ISBN 978-0-387-85572-1
- ◇ Luca De Cicco, S. Mascolo, V. Palmisano, "An Experimental Investigation of the End-to-End QoS of the Apple Darwin Streaming Server", in *Proc. WWIC 2008*, Tampere, Finland, May, 2008
- ◇ J. Khoury, Luca De Cicco, H. Jerez, C. Abdallah, J. Crichigno, W. Shu, G. Heileman, "Design and Implementation of a Framework for Persistent Identification and Communication in Emerging Networks", in *Proc. of IEEE TRIDENTCOM 2008*, Innsbruck, Austria, March, 2008
- ◇ Luca De Cicco, S. Mascolo, V. Palmisano, "Skype Video Responsiveness to Bandwidth Variations", in *Proc. of ACM NOSSDAV '08*, Germany, May, 2008
- ◇ J. Khoury, J. Crichigno, Luca De Cicco, C. T. Abdallah, W. Shu, and G. Heileman, H. Jerez, "The InterMesh Network Architecture", *Mobicom 2007, Montreal, Canada (Demo Session)*, September, 2007
- ◇ Luca De Cicco, S. Mascolo and V. Palmisano, "An Experimental Investigation of the Congestion Control Used by Skype VoIP", in *Proceedings of WWIC 2007*, May 2007
- ◇ Luca De Cicco and Saverio Mascolo, "TCP Congestion Control over 3G Communication Systems: an Experimental Evaluation", in *Proceedings of NEW2AN 2007*

- ◇ Luca De Cicco, Saverio Mascolo, "TCP versus TFRC over wired and wireless Internet scenarios: an experimental evaluation", *NEW2AN 2006*, January 2006
- ◇ D. Valerio, L. De Cicco, S. Mascolo, F. Vacirca, T. Ziegler, "Optimization of IEEE 802.11 parameters for wide area coverage", *MEDHOCNET 2006*, November 2005
- ◇ Luca De Cicco and Saverio Mascolo, "Libnetmeas: A Library for Automatic Evaluation of Transport and Application Layer Network Metrics", Technical report 1-10/06, October 2006
- ◇ Luca De Cicco and Saverio Mascolo, "SIP Overload Control", Technical report 1-11/07, November 2007

- IETF DRAFTS ◇ H. Lundin, S. Holmer, H. Alvestrand, L. De Cicco, and S. Mascolo, "A Google Congestion Control Algorithm for Real-Time Communication", IETF draft RMCAT wg, draft-alvestrand-rmcat-congestion-02, Feb 2014

- TALKS ◇ L. De Cicco, G. Carlucci, and S. Mascolo, "Understanding the Dynamic Behaviour of the Google Congestion Control", *Proc. of Packet Video Workshop 2013*, San Jose, CA, USA, Dec 2013
- ◇ L. De Cicco, G. Carlucci, and S. Mascolo, "Experimental Investigation of the Google Congestion Control for Real-Time Flows", ACM SIGCOMM 2013 Workshop on Future Human-Centric Multimedia Networking, Hong Kong, China, August 2013
- ◇ L. De Cicco, S. Mascolo, and D. Calamita, "A Resource Allocation Controller for Cloud-based Adaptive Video Streaming", IEEE ICC'13 - 1st International Workshop on Mobile Cloud Networking and Services (MCN), Budapest, Hungary, June, 2013
- ◇ L. De Cicco, S. Mascolo, V. Palmisano, "A Mathematical Model of the Skype VoIP Congestion Control Algorithm", in Proc. IEEE Conference on Decision and Control 2008, Cancun, Mexico, Dec, 2008
- ◇ L. De Cicco, S. Mascolo and V. Palmisano, "An Experimental Investigation of the Congestion Control Used by Skype VoIP", WWIC 2007, Coimbra, Portugal, May, 2007
- ◇ L. De Cicco and S. Mascolo, "TCP Congestion Control over 3G Communication Systems: an Experimental Evaluation of New Reno, BIC and Westwood+", 9th COST 290 Meeting, Coimbra, Portugal, May, 2007

- INVITED TALKS ◇ L. De Cicco, G. Carlucci, and S. Mascolo, "Understanding the Dynamic Behaviour of the Google Congestion Control", Invited seminar at LINCSE, Paris, France, Dec 4, 2013
- ◇ L. De Cicco, "Adaptivity in Multimedia Flows", Invited seminar at LAAS CNRS, Toulouse, France, Feb 16, 2012
- ◇ L. De Cicco, "PI Network Layer Implementation", FIND Meeting, Albuquerque, NM, USA, Oct 5, 2007

- PATENTS ◇ Luca De Cicco, Saverio Mascolo, "Meccanismo per il controllo del bitrate di codifica in un sistema di video streaming adattativo basato sul buffer di playout e sulla stima di banda", Italian patent application no. BA2013A000077, filed on 25 November 2013
- ◇ Luca De Cicco, Saverio Mascolo, "An actuator for implementing rate-based packet sending over packet switching networks", US patent 7916637, filed 1st July 2009 and granted on March 3rd 2011
- ◇ Luca De Cicco, Saverio Mascolo, "An Actuator for implementing rate-based packet sending over packet switching networks", PCT/IB2009/006186 filed 08 July 2009
- ◇ Luca De Cicco, Saverio Mascolo, "Meccanismo di attuazione per l'invio di pacchetti in modalit  rate-based su reti di comunicazione a commutazione di pacchetto", Italian patent application no. BA2008A000024, filed 9 July 2008

- TECHNOLOGY TRANSFER ◇ He is co-founder of Quavlive s.r.l. (<http://www.quavlive.com>) spin-off of Politecnico di Bari. The mission of the company is to develop innovative solutions in the field of the distribution of video over the Internet by exploiting the associates patents and know-how.

PHD COURSES	<ul style="list-style-type: none"> ◇ <i>1st HYCON PhD School on Hybrid Systems</i>, 19-22 July 2005, Siena Italy. ◇ Tutorial on <i>Peer-to-Peer Networking</i>, by Raouf Boutaba, Networking 2006, May 15-19 2006, Coimbra Portugal. ◇ Workshop on <i>Performance Control in Wireless Sensor Networks</i>, Networking 2006, May 15-19 2006, Coimbra Portugal. ◇ PhD School <i>X CIRA Scuola di dottorato sui Sistemi Positivi</i> (PhD school on Positive Systems), July 10-16 2006, Bertinoro Italy.
REVIEWING ACTIVITY	<ul style="list-style-type: none"> ◇ He has been selected by the Romanian National Development and Innovation Council to serve as a reviewer for the Romanian Joint Applied Research Projects proposals in 2011-2012 ◇ IEEE Journal on Selected Areas in Communication (2013) ◇ Automatica (2013) ◇ IEEE Transactions on Multimedia (2011-2012) ◇ IEEE Transactions on Automatic Control (2006-2013) ◇ Computer Networks, (Elsevier) (2007-2013) ◇ IEEE Conference on Decision and Control (2006-2013) ◇ IEEE American Control Conference (2006-2011) ◇ Wired/Wireless Internet Communications (WWIC) (2006-2009) ◇ IEEE Transactions on Vehicular Technology (2011) ◇ AINTEC 2013
TEACHING	<ul style="list-style-type: none"> ◇ He is contract professor of the course “Feedback control of dynamic systems in the state-space” (Electronic Engineering Master, Politecnico di Bari, Taranto, Italy) (2013/2014) ◇ He has been contract professor of the course “Fondamenti di Automatica I” (Automatic Controls I) (Electronic Engineering, Politecnico di Bari, Italy) (2008/2009 and 2009/2010) ◇ He has been contract professor of the course “Fondamenti di Automatica I” (Automatic Controls I) (Electronic Engineering, Politecnico di Bari, Italy) (2008/2009 and 2009/2010) ◇ He has held a 40 hours course named “The unix-based operating system: GNU/Linux” as a module of the Cisco Certification course (CCNA) held in Matera, Italy, 2004 ◇ He has held a 65 hours course named “GNU/Linux for the telecommunications” for the training of 6 employees of the telecommunication company AET (Apparecchiature Elettro Telefoniche) S.r.l., (Bari, 2007). ◇ He has been TA for the courses “Automatic Controls I” and “Automatic Controls II” at Politecnico di Bari, 2005, 2006, 2007 ◇ He held several workshops about linux kernel and implementation of congestion control in the linux kernel for the course “Control methods for Telecommunications” (Politecnico di Bari) ◇ Since 2007, he serves as a member of the commission for the proficiency exams “Automatic Controls I”, “Automatic Controls II”, “Control tools for Telecommunication applications” (Telecommunication Engineering, Politecnico di Bari). ◇ He has been co-advisor of more than 30 thesis (Politecnico di Bari)
PHD JURIES	<ul style="list-style-type: none"> ◇ Mi-parcours evaluation of YiXi GONG, LINCSE, Telecom Paris Tech, 27/02/2014, Jury: Luca De Cicco, Renata Teixeira (INRIA)
SKILLS	<ul style="list-style-type: none"> ◇ Networking Excellent skills in developing and designing TCP/IP stack applications, even in the transport layer of the Linux Kernel. Highly skilled in congestion control algorithms implementation at application layer for video streaming and Voice over IP (VoIP) applications. He is currently maintaining the TCP Westwood+ module in the Linux Kernel since 2.6.16 release. He has authored a patch for Web100 which enables logging of the Westwood+ end-to-end available bandwidth.

- ◇ **Operating Systems** Linux user and developer until 1996. Excellent skills in the administration and usage of the most important GNU/Linux distributions. Basic knowledge of Linux Kernel internals.
- ◇ **Programming Languages** Design and implementation of applications (networking, graphical interfaces, web services) in the following programming languages: C, C++, python, perl, PHP, bash, Tcl
- ◇ **Embedded Systems** Since 2003 he is an active member and developer in the handhelds.org project (www.handhelds.org) which aims at porting the linux kernel and applications on handhelds devices.
He is active member of the GPE project (<http://gpe.linuxtogo.org/>) and he is mantainer of several applications he wrote. He is promotor of a project named GPE Device Manager which aims at providing a plugin structure for the generic managment of hardware devices present in PDA systems.
Since July 2005 he contributes to the Maemo project (www.maemo.org) and he is in the developer program of the internet tablets N770, N800 and N810.

FOREIGN
LANGUAGES

- ◇ **English** Very good (written and spoken)
- ◇ **Portuguese** Good (written and spoken).
- ◇ **French** Beginner (written and spoken).
- ◇ **Spanish** Beginner (spoken).

REFERENCES

- ◇ **Prof. Saverio Mascolo**
Full Professor at Politecnico di Bari.
Via Orabona, 4
Bari, 70124, Italy
tel:+390805963621
email: mascolo@poliba.it
- ◇ **Prof. Chaouki Abdallah**
Full Professor and Chair of the ECE department of University of New Mexico (UNM).
1 University of New Mexico
MSC01 1100
Albuquerque,NM, 87131-0001, USA
tel:+505-277-0298
email: chaouki@ece.unm.edu
- ◇ **Prof. Silviu-Iulian Niculescu**
3 rue Joliot-Curie
91192 Gif-sur-Yvette cedex, France
tel:+33(0)169851715
email: niculescu@lss.supelec.fr

February 28, 2014

Luca De Cicco