

# Luca De Cicco

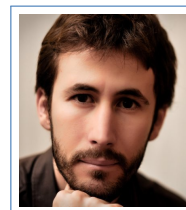
## Curriculum Vitae

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📄 [c3lab.poliba.it/index.php/LDC](http://c3lab.poliba.it/index.php/LDC)



### Current position

Researcher at the Technical University of Bari (Politecnico di Bari) currently visiting the LINCS lab, TELECOM, Paris Tech, France

### Bibliometric indices

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### Main Contributions

Awards **Google Faculty Award 2014** for the research project “Congestion Control for Web Real-Time Communication (WebRTC)”

Control of Computer Networks Research in the field of time-delay systems with application to telecommunication and computing systems.

Modelling Hybrid modelling of two relevant Internet applications: **Skype** congestion control (the most popular videoconference software) and the video quality automatic control system of the **Akamai** adaptive-streaming platform (CDN worldwide leader).

Technology Design, implementation, and experimental evaluation of pre-industrial prototypes in the context of audio/video transport over the Internet (see Patents and Technology transfer sections).

Standardization 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

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## Visiting positions

- 9/2013–3/2014 **LINCS, TELECOM, Paris Tech**, Paris, *France*.  
Prof. Dario Rossi research group
- 9/2012–3/2013 **Ecole Supérieure d'Electricité (SUPELEC)**, Gif-sur-Yvette,  
Paris, *France*.  
Prof. Prof. Silviu Iulian Niculescu research group
- 10–12/2007 **Ecole Supérieure d'Electricité (SUPELEC)**, Gif-sur-Yvette,  
Paris, *France*.  
Prof. Prof. Silviu Iulian Niculescu research group
- 9/2013–3/2014 **University of New Mexico (UNM)**, Albuquerque, NM, USA.  
Prof. Chaouki Abdallah research group, research collaboration in the context  
of the “Future Internet Design” NSF project .

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## Professional experience

- 12/2011-today Researcher at the Technical University of Bari (Politecnico di Bari),  
Italy
- 2/2011-8/2011 Research contract at Technical University of Bari (Politecnico di Bari),  
Italy, AVIO project
- 11/2008-  
11/2010 Post-doc at Technical University of Bari (Politecnico di Bari), Italy,  
on the project “Telecommunication infrastructures and Wireless sensor  
networks for disaster management” PS 121, funded by Regione Puglia
- 7/2008-  
11/2008 Research contract at Technical University of Bari (Politecnico di Bari),  
Italy on the research project “Experimental evaluation of transport pro-  
tocols for audio/video and data delivery over 3G-4G wireless networks”

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## Education and titles

- Qualification for the selection of Associate Professors in the Section 61 (Computer  
(2012) Science Engineering, Automatica and signal processing), issued by the  
French Ministry of Education, qualif. ID: 12261231028
- Ph.D. (4/2005-  
4/2008) Politecnico di Bari (Italy), Advisor: Prof. Saverio Mascolo. Title of  
the thesis: Modeling, design and implementation issues in Multimedia  
Congestion Control Algorithms.
- M.Sc. in Computer Science Engineering, magna cum laude, Politecnico di  
(1997-2003) Bari (Italy). Advisors: Prof. P. Camarda, Prof. S. Mascolo, L.A.  
Grieco, Dissertation: Congestion Control Algorithms for Multimedia  
Applications.

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## Teaching

- 2013-2014 Feedback control of dynamical systems, 60 hours course, Politecnico di  
Bari, Taranto, Italy

- 2009-2010 Fundamentals of Control Systems 1st module, 60 hours course, Politecnico di Bari, Bari, Italy
- 2008-2009 Fundamentals of Control Systems 1st module, 60 hours course, Politecnico di Bari, Bari, Italy
- 2007-2008 Fundamentals of Control Systems 2nd module, 20 hours TA, Politecnico di Bari, Bari, Italy
- 2007 “The GNU/Linux operating system”, 80 hours, AET, Bari, Italy
- 2006-2007 Fundamentals of Control Systems 1st module, 20 hours TA, Politecnico di Bari, Bari, Italy
- 2005-2006 Fundamentals of Control Systems 1st module, 20 hours TA, Politecnico di Bari, Bari, Italy
- 2004 “The GNU/Linux operating system”, module of the CISCO CCNA certification

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## PhD juries

- 27/02/2014 Mid-term evaluation of the Ph.D. student YiXi GONG, LINCS, TELECOM Paris Tech, Ecole doctorale EDITE. Advisor: Prof. Dario Rossi. Jury: Luca De Cicco, Renata Teixeira (INRIA)

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## Publications

### International Journals

- CONES 2014 Luca De Cicco, G. Cofano, and S. Mascolo, “Local SIP Overload Control: Controller Design and Optimization by Extremum Seeking”, *IEEE Transactions on Control of Network Systems*, accepted for publication, to appear
- TNET 2014 Luca De Cicco and S. Mascolo, “An Adaptive Video Streaming Control System: Modelling, Validation, and Performance Evaluation”, *IEEE/ACM Transaction on Networking*, Volume 22, Issue 2, April 2014
- TAC 2010 Luca De Cicco, S. Mascolo, “A Mathematical Model of the Skype VoIP Congestion Control Algorithm”, *IEEE Transactions on Automatic Control*, vol. 55, n. 3, pp 790-795, Mar 2010 (IF: 3.293)
- Automatica 2011 Luca De Cicco, S. Mascolo, S.-I. Niculescu, “Robust Stability Analysis of Smith Predictor-based Congestion Control Algorithms for Computer Networks”, *Automatica*, Elsevier, vol. 47, issue 8, pp. 1685-1692, Aug. 2011, (IF: 3.178)
- COMNET 2011 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 conference with publication of proceedings

- SAC-15 Gaetano Carlucci, Luca De Cicco, Saverio Mascolo, “HTTP over UDP: an experimental investigation of QUIC”, in Proc. of 30th ACM/SIGAPP Symposium On Applied Computing (SAC 2015), Salamanca, Spain, April 2015
- VidNext14-1 Giuseppe Cofano, Luca De Cicco, Saverio Mascolo, “A Control Architecture for Massive Adaptive Video Streaming Delivery”, in Proc. of ACM VideoNext Workshop, Sydney, Australia, December 2014
- VidNext14-1 Luca De Cicco, Vito Caldaralo, Vittorio Palmisano, Saverio Mascolo, “TAPAS: a Tool for rApid Prototyping of Adaptive Streaming algorithms”, in Proc. of ACM VideoNext Workshop, Sydney, Australia, December 2014
- CDC-14 Luca De Cicco, Gaetano Carlucci, Saverio Mascolo, “Modelling and Control for Web Real-Time Communication”, In Proc. of 53rd IEEE Conference on Decision and Control, Los Angeles, California, USA, December 2014
- MED-14 Luca De Cicco, Saverio Mascolo, “TCP Congestion Control over HSDPA: an Experimental Evaluation”, In Proc. of 22nd Mediterranean Conference on Control & Automation, Palermo, Italy, June 2014
- ECC-14 L. De Cicco, S. Mascolo, S-I. Niculescu, “The Trade-off between Robustness and Disturbance Rejection for Congestion Control Algorithms based on a Modified Smith-Predictor”, in Proc. of European Control Conference 2014, Strasbourg, France, 24-27 June 2014
- IFAC-WC14 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
- PV13 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
- PV13-2 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
- CDC13 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
- FHMN13 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

- WWIC13 Luca De Cicco, G. Cofano, and S. Mascolo, "Local SIP Overload Control", Proc. of WWIC 2013, S. Petersburg, Russia, June, 2013
- WoWMoM13 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
- ICC13 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
- MSC11 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
- MMSYS11 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
- USAB10 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
- ICNP09 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%)
- TDS09 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
- CDC08 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
- COST290 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
- WWIC08 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

- Tridentcom08 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
- NOSSDAV08 Luca De Cicco, S. Mascolo, V. Palmisano, "Skype Video Responsiveness to Bandwidth Variations", in Proc. of ACM NOSSDAV '08, Germany, May, 2008
- MOBICOM demo 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
- WWIC07 Luca De Cicco, S. Mascolo and V. Palmisano, "An Experimental Investigation of the Congestion Control Used by Skype VoIP", in Proc. of WWIC 2007, May 2007
- NEWAN07 Luca De Cicco and Saverio Mascolo, "TCP Congestion Control over 3G Communication Systems: an Experimental Evaluation", in Proc. of NEW2AN 2007
- NEWAN06 Luca De Cicco, Saverio Mascolo, "TCP versus TFRC over wired and wireless Internet scenarios: an experimental evaluation", in Proc. of NEW2AN 2006 , January 2006
- MedHocNet06 D. Valerio, L. De Cicco, S. Mascolo, F. Vacirca, T. Ziegler, "Optimization of IEEE 802.11 parameters for wide area coverage", MEDHOCNET 2006, November 2006
- Tech01 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

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## Standardization

- IETF draft 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

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## Patents

- US-2 2014 Luca De Cicco, Saverio Mascolo, "Controlling Player Buffer and Video Encoder For Adaptive Video Streaming", US patent application, filed on November, 20th 2014

- IT-2 2013 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 no. BA2013A000077, 25/11/2013
- EU-1 2011 Luca De Cicco, Saverio Mascolo, "An actuator for implementing rate-based packet sending over packet switching networks", US patent 7916637, granted on March, 3rd 2011
- US-1 2009 Luca De Cicco, Saverio Mascolo, "An Actuator for implementing rate-based packet sending over packet switching networks", PCT/IB2009/006186 filed on July, 8th 2009
- IT-1 2011 Luca De Cicco, Saverio Mascolo, "Meccanismo di attuazione per l'invio di pacchetti in modalità rate-based su reti di comunicazione a commutazione di pacchetto", Italian Patentno. BA2008A000024, granted on 15/9/2011

## Seminars

- 19/11/2014 "Adaptive Video Streaming Systems: from theory to practice", lecture at TELECOM Paristech, Paris, France, Athens Week (<http://www.athensprogramme.com/>)
- 12/11/2014 "Controlling Adaptive Video Streaming Systems: one Knob is Enough", seminar at LINCOS, Paris, France
- 4/12/2013 "Understanding the Dynamic Behaviour of the Google Congestion Control", seminar at LINCOS, Paris, France
- 16/2/2012 "Adaptivity in Multimedia Flows", seminar at LAAS CNRS, Toulouse, France
- 5/10/2007 "PI Network Layer Implementation", FIND Meeting, Albuquerque, NM, USA

## Technology Transfer

- Quavlive srl He is co-founder of Quavlive s.r.l. (<http://www.quavlive.com>) spin-off of Politenico 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.
- webtv.poliba.it The spin-off has developed the Web-TV site of the Technical University of Bari (<http://webtv.poliba.it>) that is based on some algorithms designed in the context of the research on adaptive video streaming (see the "Publications" section - MMSYS11 and PV13-2).

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## Research Projects

- 2014 *Congestion Control for Web Real-Time Communication (WebRTC)*, Google Research Award 2014 Role: contributor, Funded by: Google, USA
- 2014-2016 *Massive Adaptive Internet Video Streaming Using the Cloud (MAIVISTO)*, PON R&C - Bando Startup. Role: project manager, Funded by: MIUR, Italy
- 2012-2015 *Platform for Innovative Service for the Future Internet (PLATINO)* PON R&C. Role: Coordinator of WP “Resource Management”, Funded by: MIUR, Italy
- 2013-2014 *Architecture for Robust and Efficient Control of Dynamic Adaptive Video Streaming over HTTP*. Role: contributor, Funded by: Cisco, “University Research Program”, Silicon Valley Community Foundation, USA
- 2008-2010 *Infrastrutture di Telecomunicazione e Reti Wireless di Sensori nella Gestione di Situazioni di Emergenza (PS 121)*, Role: contributor, Funded by: “Regione Puglia”, Italy
- 2007 *Future Internet Design (FIND)*. Funded by: “National Science Foundation”, USA
- 2007-2008 *End-to-end protocols for video over IP*, Funded by: “Financial Tradeware plc”, Italy
- 2006-2007 *Traffic and QoS management in Wireless Multimedia Networks*, Funded by: COST 290 action, EU
- 2006-2007 *Fluid Analytical Models Of Autonomous Systems (FAMOUS)*, Funded by: MIUR (PRIN no. 2005093971), Italy
- 2005-2006 *End-to-End protocols for audio/video over Internet protocol*, Funded by: Financial Tradeware, Italy

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## Reviewing activities

- Research projects 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 and 2013-2014.
- Journals IEEE Journal on Selected Areas in Communication, Automatica, IEEE Transactions on Multimedia, IEEE Transactions on Automatic Control, Computer Networks, (Elsevier), IEEE Transactions Vehicular Technology
- Conferences IEEE Conference on Decision and Control, IEEE American Control Conference, Wired/Wireless Internet Communications (WWIC), AIN-TEC 2013



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## Languages

Italian	<b>Natural language</b>
English	<b>Advanced</b>
French	<b>Intermediate</b>
Portuguese	<b>Intermediate</b>

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## Computer skills

Programming	C, C++, Java, Python, perl
Scripting	Bash, tcl
Scientific	Matlab, Simulink, Mathematica
Typesetting	L <sup>A</sup> T <sub>E</sub> X, L <sup>A</sup> X, Xfig
Network Simulators	NS-2, Omnet++
Operating Systems	Linux (kernel hacking), Unix, Windows
Administration	Apache, MySql, Mailman
Web design	PHP, XHTML, CSS, AJAX, WebRTC, Javascript, JQuery
Mobile	Development of Android apps

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## References

- Silviu-Iulian  
Niculescu** Full professor and chair of the Laboratoire des signaux et systèmes (L2S), SUPELEC, 3 rue Joliot-Curie 91192 Gif-sur-Yvette cedex, France, tel:+33(0)169851715, email: niculescu@lss.supelec.fr
- Dario Rossi** Full Professor at TELECOM Paris Tech and at the LIX department of the Ecole Polytechnique. 23 avenue d'Italie, 75013 Paris, France, tel: +33(0)145817158, email: dario.rossi@enst.fr
- Saverio  
Mascolo** Full Professor at the Technical University of Bari, Via Orabona, 4 Bari, 70124, Italy, tel:+390805963621, email: mascolo@poliba.it
- Chaouki  
Abdallah** Full Professor and chair of the ECE Department at 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