

Andrea Carena

Curriculum Vitæ

Personal information :

Gender: Male
Date of birth: 7 October 1970
Nationality: Italian

Work Address :

Politecnico di Torino
Dipartimento di Elettronica e Telecomunicazioni
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Professional Positions

Oct 2014 - now Associate Professor of Telecommunications at Dipartimento di Elettronica e Telecomunicazioni, Politecnico di Torino.

Jan 2004 - Sep 2014 Assistant Professor of Telecommunications at Dipartimento di Elettronica e Telecomunicazioni, Politecnico di Torino.

Jan 1999 - May 2003 Post-doctoral in the Optical Communication Group of Dipartimento di Elettronica, Politecnico di Torino.

Jan 1999 - Sep 2002 Consultant of Artis Software srl for the development of OptSim, an optical communication system simulator.

Education

Mar 1999 Ph.D. degree in Electronics and Communications Engineering from Politecnico di Torino, Torino - Italy.

July 1995 M.Sc. degree (summa cum laude) in Electronic Engineering from Politecnico di Torino, Torino - Italy.

July 1989 High school degree from “Istituto tecnico Don Bosco”, Lombriasco (TO) - Italy.

Academic offices

Since January 2004 he is member of the Erasmus-LLP Mobility Commission at Politecnico di Torino, being in charge of the approval of Learning Agreements for all incoming and outgoing students enrolled in “Communication Engineering” and “Computer and Communication Networks Engineering” courses.

He has been tutor for more than fifty M.Sc. students, directing their final project work. He has been a supervisor Ph.D. students enrolled in the Doctorate Course in Electronics and Communications Engineering at Politecnico di Torino.

Research positions

Jan 1999 - now Member of the Optical Communication Group (OptCom, www.optcom.polito.it) at Dipartimento di Elettronica e Telecomunicazioni, Politecnico di Torino directed by Prof. Pierluigi Poggiolini.

Sep 1997 - Aug 1998 Visiting scholar in the “Optical Communications and Photonic Networks” (OCPN), directed by Prof. Daniel J. Blumenthal, first at the Microelectronics Research Center del Georgia Institute of Technology di Atlanta (GA-USA) then at the Department of Electrical and Computer Engineering della University of California at Santa Barbara di Santa Barbara (CA-USA).

Nov 1995 - Nov 1998 Ph.D. student in the Optical Communication Group at Dipartimento di Elettronica, Politecnico di Torino, tutor Prof. S. Benedetto, with a scholarship from Italian Ministry of Research, University and Education.

Research activities

In the following are listed main research activities conducted by Andrea Carena:

- Modeling of non-linear fiber propagation in uncompensated links for coherently detected modulation formats.
- Study of Nyquist-WDM as an effective technique for increasing the spectral efficiency of optical communication links.
- Theoretical, simulative and experimental study of optical communication systems based on coherent receivers and electronic digital signal processing for future 100 Gbps channels and beyond. Application of QPSK, 8QAM and 16QAM to long-haul link together with polarization multiplexing.
- Study of non-linear fiber propagation: theoretical analysis of the interaction between signal and noise under the Kerr effect (Parametric Gain).
- Study of simplified models for multi-channel systems considering non-linear fiber propagation effects (Cross-Phase Modulation e Four Wave Mixing)

- Development of algorithm for the simulation of the propagation in the optical fiber. Results from this activity have contributed to the realization of the commercial simulator OptSim, now a product of Synopsys Inc. (SNPS:NASDAQ).
- Study of algorithm for performance evaluation of optical communication systems based both on IMDD and on advance modulation formats (DPSK e DQPSK).
- Experimental demonstration of optical packet networks. He collaborated in building the prototype of OPERA, a label swapping network developed at UCSB (CA-USA) under the direction of Prof. Daniel Blumenthal, and the RINGO-WONDER demonstrator at Politecnico di Torino under the direction of Proff. Benedetto and Neri.
- Analysis of the performance of optical amplifiers: optimization of hybrid EDFA-Raman amplification and gain control for signal transient in EDFA.
- Analytical study and experimental demonstration of constant envelope modulation formats for optical link based on SOA amplification. In particular polarization modulation (PolSK), duobinary, DPSK, DQPSK and CPFSK. In the framework of several national and european projects transmitter and receiver prototype have been realized and characterized both at 10 and 40 Gbps.

Teaching activities

In the following a list of courses taught during past years:

- **A.A. 2014-2015**
'A Revolution in Optical Communication Systems: Coherent Detection for 100G and Beyond', belonging to the Doctoral School of Politecnico di Torino.

- **A.A. 2014-2015**
 Assistant of Prof. P. Crovetto in the organization of 'Electric and Electronic Systems in vehicles', belonging to the M.Sc. in "Automotive Engineering" of Politecnico di Torino.
- **A.A. 2014-2015**
 Assistant of Prof. M. Mondin in the organization of 'Simulation of Communication Systems', belonging to the M.Sc. in "Telecommunication Engineering" of Politecnico di Torino.
- **A.A. 2013-2014**
 'Transmission channels', belonging to the Specializing Master in "Future Broadband Networks" of Politecnico di Torino.
- **A.A. 2012-2013 2013-2014 2014-2015**
 Assistant of Prof. R. Gaudino in the organization of 'Digital Transmission', belonging to the B.Sc. in "Telecommunication Engineering" of Politecnico di Torino.
- **A.A. 2012-2013 2013-2014 2014-2015**
 'Networking and Telecommunication Laboratory', belonging to the B.Sc. in "Telecommunication Engineering" of Politecnico di Torino.
- **A.A. 2011-2012**
 'Trasmissione dell'Informazione' (Information Transmission), belonging to the B.Sc. in "Cinema and Media Engineering" of Politecnico di Torino.
- **A.A. 2011-2012**
 'Optical Transmission I', belonging to the Specializing Master in "Optical Communications and Photonics Technologies" of Politecnico di Torino.
- **A.A. 2010-2011**
 'Sistemi di Trasmissione' (Transmission Systems), belonging to the M.Sc. in "Electronic Communication Engineering" of Politecnico di Torino.
- **A.A. 2007-2008 2008-2009 2009-2010 2010-2011**
 'Photonics Transmission Systems', belonging both to the M.Sc. in

“Communication Engineering” and “Computer and Communication Networks Engineering” of Politecnico di Torino.

- **A.A. 2007-2008 2009-2010**
'Optical Transmission II', belonging to the Specializing Master in “Optical Communications and Photonics Technologies” of Politecnico di Torino.
- **A.A. 2003-2004 2004-2005 2005-2006 2006-2007**
'Telecomunicazioni in fibra ottica II' (Fiber optic communication II), belonging to the M.Sc. in “Communication Engineering” (italian track) of Politecnico di Torino.
- **A.A. 2007-2008 2008-2009**
Assistant of Prof. P. Poggiolini in the organization of 'Telecomunicazioni in fibra ottica II' (Fiber optic communication II), belonging to the M.Sc. in “Communication Engineering” (italian track) of Politecnico di Torino. He developed and presented exercises and laboratory experience to the students.
- **A.A. 2003-2004 2004-2005 2005-2006 2006-2007 2007-2008 2008-2009 2009-2010 2010-2011**
Assistant of Ing. V. Ferrero, in the organization of 'Telecomunicazioni in fibra ottica I' (Fiber optic communication I), belonging to the M.Sc. in “Communication Engineering” (italian track) of Politecnico di Torino. He developed and presented exercises and laboratory experience to the students.
- **A.A. 2003-2004 2004-2005 2005-2006 2006-2007**
Assistant of Prof. P. Poggiolini in the organization of 'Optical Transmission II', belonging to the Specializing Master in “Optical Communications and Photonics Technologies” of Politecnico di Torino.
- **A.A. 2003-2004 2004-2005 2005-2006 2006-2007**
Assistant of Ing. V. Curri, in the organization of 'Optical Transmission I', belonging to the Specializing Master in “Optical Communications and Photonics Technologies” of Politecnico di Torino.

Languages

- **Italian:** mother tongue.
- **English:** fluent spoken and written, TOEFL - CBT exam: 253/300.
- **French:** elementary.

Publications

Andrea Carena is co-author of 160 publications:

- 53 paper on international journals;
- 82 contributions to international conferences;
- 25 contributions to national conferences.