

Curriculum Vitae – Prof. Gabriella Olmo (orcid.org/0000-0002-3670-9412)

Education

2016: M.Sc. in Medicine and Surgery, Università degli Studi di Torino (UNITO), first class honors, dissertation recommended for publication.

2002: Ph.D. in Electronic Engineering, Politecnico di Torino (POLITO).

1986: M.Sc. in Electronic Engineering, POLITO, Summa cum Laude.

Appointments

Since 2023: Full Professor at Dept. of Control and Computer Engineering, POLITO.

2017 - 2022: Associate Professor at Dept. of Control and Computer Engineering, POLITO.

2017: Qualification to practice as a Physician (score 265.5/270).

2002-2017: Associate Professor at Dept. of Electronics and Telecommunications, POLITO.

1995-2002: Assistant Professor at the Department of Electronics, POLITO.

1991-1995: Research assistant at the Department of Electronics, POLITO.

1987: Qualification to practice as an Engineer.

1987-1988: Researcher at Telecom Italia Labs, Torino.

Summary of Research Activity

Gabriella Olmo started her scientific research in early 1990's. Her main interests were on digital modulation and channel coding for wireless transmission, encoded digital modulation, trellis coded modulation for coherent optical communications, code division multiple access schemes. In the early 2000s, she founded the Image Processing Lab, a research group on topics related to resilient image and video coding transmission on error-prone mobile radio channel, multimedia wireless communications, digital joint modulation and encoding, digital signal processing. In more detail, her main research topics were: still image encoding for mobile transmission (integer wavelet encoding, filter banks and lifting scheme, arithmetic encoding); video encoding and compression for wireless transmission (resilience tools for H.264/AVC, video concealment); distributed source coding (LDPC and turbo-codes for Slepian-Wolf coding of image and video, joint de-quantization of distributed sources, distributed encoding of tele-monitoring images, distributed arithmetic coding); joint source-channel coding (unequal/hybrid loss protection of progressive sources, rate allocation and optimization, error sensitivity and retransmission strategies, turbo/LDPC/digital fountain codes, windowed raptor co-decoding); robust variable-length coding (maximum-a-posteriori decoding of arithmetic codes with forbidden symbol, robust video transmission using error correcting arithmetic codes, iterative decoding of serially concatenated arithmetic and channel codes); multiple description coding; SAR and hyperspectral image compression.

Since 2009, she has progressively left the IPL direction, and dedicated to the study of medicine, achieving the M.Sc. in Medicine and Surgery and the qualification to practice as a physician (Regional Register of Doctors Surgeons and Dentists of Turin, No. 24028). At present, she is member of the Signal Biology Group at the Department of Control and Computer Engineering, POLITO. She is responsible for research activities in signal processing and machine/deep learning for e-health applications: sensor networks and artificial intelligence algorithms for health monitoring; disease prevention and follow-up; remote monitoring of neurodegenerative disease patients using inertial signals and voice; sleep disorder analysis; neural interface to assess the consciousness level of non-responsive patients; Parkinson's disease motor fluctuation monitoring using wearable sensors; fatigue in Multiple Sclerosis

patients; microcephaly and microtubule anomalies; network-based approaches to define the pathogenesis of pervasive developmental disorders. These research activities are performed in strict cooperation with hospitals and patients' associations (e.g., the Regional Reference Centre for Parkinson's Disease and Movement Disorder at the Città della Salute e della Scienza Hospital, Turin; the Department of Neuroscience "Rita Levi Montalcini", UNITO; the Regional Multiple Sclerosis Centre, San Luigi Gonzaga Hospital, Turin; the Department of Molecular Biotechnology and Health Sciences, the Department of Human Genetics, the Department of Public Health and Paediatric Sciences University of Turin; the Umberto I Hospital, Rome).

Gabriella Olmo participated with roles of responsibility in numerous competitive national and international research projects, awarded through a peer-review process. A selected list of projects follows.

- COAST: Content Aware Searching, retrieval and sStreaming, FP7-ICT-2009-4 research project funded by the European Union, 2010-2012.
- NEWCOM++: Network of Excellence in Wireless Communications, VII Framework Programme of the European Union, thematic priority Information Society Technology (IST), 2008-2011
- SEA: SEAMless Content Delivery, VII Framework Programme of the European Union, 2008-2009.
- STEP2: Video Streaming for P2P transmission", Italian Ministry of Education and Research grant, 2008.
- MEADOW: Mesh adaptive home wireless nets, Italian Ministry of Education and Research grant, 2006-2008
- NEWCOM: Network of excellence in wireless communications, VI Framework Programme of the European Union, thematic priority Information Society Technology (IST), 2004-2006.
- DSC: Distributed Coding of Multiple Video Sources, Italian Ministry of Education and Research, 2005-2006.
- PRIMO: Reconfigurable platforms for broadband wireless communications, Italian Ministry of Education and Research grant, 2001-2005.
- CERCOM: (Center of Excellence in Wireless Communications), Italian Ministry of Education and Research grant, 2000-2004.
- "Robust watermarking of multispectral images", Italian Ministry of Education and Research grant, 2003.
- ACHYDA: Advanced methods for lossless compression of hyperspectral data, European Space Agency grant, 2002-2003.
- "Personal wideband communication systems based on satellites and stratospheric platforms", Italian Ministry of Education and Research grant, 2002.

She is involved in several PNRR initiatives, among which the "Ecosistema NODES - Nord Ovest Digitale e Sostenibile" and the Structural Project "Services and systems for extreme environments and domain-specific scenarios," PNRR Partenariato Esteso 14 "RESTART," where she holds the role of Reference Investigator for Politecnico di Torino.

Gabriella Olmo has been formally responsible of numerous BSc and M.Sc. degree courses at POLITO, related to communication systems and DSP, digital signal processing, image and video processing, multimedia transmission over wireless networks, probability and random processes, telemedicine. She has been supervisor of 5 Ph.D. students in Computer and Control Engineering and 6 Ph.D. students in Electrical, Electronics and Communications Engineering; supervisor of 4 post-Doc students in Electrical, Electronics and Communications Engineering and 7 post MS degree in Electronics and Communications and in Computer Engineering. She has been advisor of more than 200 BS and MS theses.

Gabriella Olmo is member of the “Collegio di Ingegneria Biomedica”, POLITO; Invited Member of the “Collegio di Ingegneria Informatica, del Cinema e Meccatronica”, POLITO; Former Member of the “Collegio di Ingegneria Elettronica, delle Telecomunicazioni e Fisica”, POLITO; Former Ph.D. Committee Member of the joint POLITO-UNITO Ph.D. programme in Bioengineering and Medical sciences.

She is Responsible of the Cooperation Agreement between the Department of Control and Computer Engineering, POLITO, and Department of Neuroscience “Rita Levi Montalcini”, UNITO, for the application of deep learning, artificial intelligence, and telecommunication methods in the remote monitoring of patients with neurodegenerative diseases (undergoing renewal). She has been scientific reviewer of projects funded by the Regione Valle d’Aosta, Italy, and Scientific Reviewer for the Swiss National Science Foundation

Gabriella Olmo is IEEE Senior Member; Member of HKN PoliTo - Mu Nu Chapter of IEEE-HKN; of the Italian Neurology Society (membership normally reserved to clinicians specialized in neurology); of the International Parkinson’s and Movement Disorders Society (accepted in recognition of interdisciplinary research). She is recipient of a donation from Rotary Club Torino Nord-Ovest for her research on Parkinson’s disease.

She serves as an Associate Editor, IEEE Transactions on Vehicular Technology. She has been Guest Editor, MDPI Electronics, Special Issue “Wearable Sensors for Supporting Diagnosis, Prognosis, and Monitoring of Neurodegenerative Diseases”, https://www.mdpi.com/journal/electronics/special_issues/Wearable_Diseases. She is Member of the Editorial board, MDPI Electronics, Section “Bioelectronics” and MDPI Electronics, Section “Artificial Intelligence Circuits and Systems” (AICAS) and EURASIP Signal Processing. She has been member of the organizing/ technical committee of several major international conferences among which: IEEE ICIP, IEEE ICASSP, IEEE ICC, EUSIPCO, ACM Workshop on Mobile Video, IEEE International Symposium on Multimedia, IEEE International Conference on Biomedical and Health Informatics.

Gabriella Olmo is co-author of two international patents and more than 200 items in international journals, conference proceedings (Scopus h-index: 25, total citation no. 2742). A full list of publication can be found at:

iris.polito.it/cris/rp/rp04747?sort_byall=2&orderall=DESC&open=all#.XHPE16DSKxA).