

Paolo Di Lorenzo

Curriculum Vitae

EDUCATION

- Nov08–Oct11** **Ph.D. in Information and Communication Engineering**, *Department of Information Engineering, Electronics and Telecommunications*, Sapienza University of Rome, Italy.
Date of final exam: 16/04/2012.
- Thesis Bio-Inspired dynamic radio access in cognitive networks based on social foraging swarms
Advisor Prof. Sergio Barbarossa
- Sep05–May08** **M. Sc. Communication Engineering**, *Sapienza University of Rome*, Italy.
- Final grade Full marks (110/110) and *summa cum laude*
GPA 29.7/30
- Thesis Wireless sensor networks with distributed decision capabilities based on self-synchronization of relaxation oscillators
Advisor Prof. Sergio Barbarossa
- Sep02–Dec05** **B. Sc. Communication Engineering**, *Sapienza University of Rome*, Italy.
- Final grade Full marks (110/110) and *summa cum laude*
GPA 28.5/30
- Thesis Decentralized control and coordination of swarms
Advisor Prof. Sergio Barbarossa
- Sep97–Jul02** **High school diploma**, *Scientific Lyceum “Taletè”*, Rome, Italy.
- Final grade Full marks (100/100).

ACADEMIC APPOINTMENTS

- Jun15–today** **Assistant Professor (RTD A)**, *Department of Engineering*, University of Perugia, Italy.
SSD: ING-INF/03, SC: 09/F2.
- Mar12-May15** **Postdoctoral research associate (Assegnista di Ricerca)**, *Dept. of Information Engineering, Electronics, and Telecommunications*, Sapienza University of Rome, Italy.
- Research title Signal processing algorithms for cognitive networks and radar remote sensing
Promoter Prof. Sergio Barbarossa
- Grants He was supported by grants coming from European research projects: FREEDOM ICT-248891, SIMTISYS SPACE-263268, and TROPIC ICT-318784.
- Sep10–Apr11** **Visiting researcher**, *Adaptive Systems Laboratory*, *Department of Electrical Engineering*, University of California Los Angeles, USA.
- Promoters Prof. Ali H. Sayed and Prof. Sergio Barbarossa

HONORS & AWARDS

- April 2017 **Italian Habilitation (Abilitazione Scientifica Nazionale)**, for Associate Professorship in Telecommunication Engineering, SC: 09/F2, SSD: ING-INF/03.
- June 2012 **GTTI Award for best Ph.D. thesis in communication engineering**, *Gruppo Telecomunicazioni e Tecnologie dell'Informazione (GTTI)*.
- Dec. 2011 **Best student paper award**, *IEEE CAMSAP 2011*, “Optimal beamforming for range/Doppler ambiguity suppression in squinted SAR systems”.
- Sept. 2011 **Best student paper award**, *EURASIP EUSPICO 2011*, “Bio-inspired swarming for dynamic radio access based on diffusion adaptation”.

- June 2010 **Best student paper award**, *IEEE SPAWC 2010*, “Distributed resource allocation in cognitive radio systems based on social foraging swarms”.
- Dec. 2011 **Grant**, received by the *IEEE Signal Processing Society* to attend the *IEEE Workshop CAMSAP 2011*.
- Sept. 2010 **Grant**, received by *Sapienza University of Rome* to visit the *University of California Los Angeles* during the period *September 2010 – April 2011*.
- Nov 2008 **Scholarship**, granted by the *Italian Ministry of Education* to pursue the *Ph.D. program*. He was first in the ranking for the selection of *Ph.D. candidates*.

RESEARCH PROJECTS

ERC projects

- ERC Starting grant 2016 **SOPHIA**, *Signal Processing and Optimization Methods for Big Data Analytics*, Role: Principal Investigator. The proposal passed the first review step and was ranked in the top 20% among the initial submissions (total number: 2935). The proposal did not pass the final review step and was not funded. However, the good result obtained in the 2016 call allows the submission of a new proposal in the 2017 ERC Starting grant call.

Current projects

- H2020 Project **5G MiEdge**, *5G MiEdge: Millimeter-wave Edge cloud as an enabler for 5G ecosystem*. Role: Task Leader.

Past projects

- European Project **TROPIC**, *Distributed computing, storage and radio resource allocation over cooperative femtocells*, *ICT-318784*. Role: WP Leader.
- European Project **SIMTISYS**, *Simulator for moving target indicator system*, *SPACE-263268*. Role: WP Leader.
- European Project **FREEDOM**, *Femtocell-based network enhancement by interference management and coordination of information for seamless connectivity*, *ICT-248891*. Role: Secondary Investigator.
- European Project **WINSOC**, *Wireless sensor networks with self-organization capabilities for critical and emergency applications*, contract number *0033914*. Role: Secondary Investigator.

TEACHING

- Fall 2016 **Teacher** for the M.sc. course “Signal Processing for Big Data”, *Sapienza University of Rome, Italy*.
- Fall 2015 **Teacher** for the Ph.D. course “Optimization, Learning, and Statistical Signal Processing over Networks”, *University of Perugia, Italy*.
- Spring 2016 **Teaching assistant** for the M.sc. course “Distributed optimization over complex networks”, taught by Prof. Sergio Barbarossa, *Sapienza University of Rome, Italy*.
- Fall 2016 **Teaching assistant** for the B.sc. course “Signal Theory”, taught by Prof. Sergio Barbarossa, *Sapienza University of Rome, Italy*.
- Spring 2015 **Teaching assistant** for the M.sc. course “Distributed optimization over complex networks”, taught by Prof. Sergio Barbarossa, *Sapienza University of Rome, Italy*.
- Fall 2015 **Teaching assistant** for the B.sc. course “Signal Theory”, taught by Prof. Sergio Barbarossa, *Sapienza University of Rome, Italy*.
- Spring 2014 **Teaching assistant** for the M.sc. course “Distributed optimization over complex networks”, taught by Prof. Sergio Barbarossa, *Sapienza University of Rome, Italy*.
- Fall 2014 **Teaching assistant** for the B.sc. course “Signal Theory”, taught by Prof. Sergio Barbarossa, *Sapienza University of Rome, Italy*.

- Spring 2013 **Teaching assistant** for the M.sc. course “Distributed optimization over complex networks”, taught by Prof. Sergio Barbarossa, Sapienza University of Rome, Italy.
- Spring 2013 **Teaching assistant** for the B.sc. course “Signal Theory”, taught by Prof. Sergio Barbarossa, Sapienza University of Rome, Italy.
- Spring 2012 **Teaching assistant** for the B.sc. course “Signal Theory”, taught by Prof. Sergio Barbarossa, Sapienza University of Rome, Italy.
- Spring 2011 **Teaching assistant** for the B.sc. course “Signal Theory”, taught by Prof. Sergio Barbarossa, Sapienza University of Rome, Italy.

LANGUAGES

- Italian Mother tongue.
- English Self-assessment (CEFR). Grade: C2 (Proficient user).

STUDENTS

He has co-supervised (with Prof. Sergio Barbarossa) the thesis work of the following students:

- PhD Student **Mikhail Tsitsvero**, *Localization properties in dual domains*, Ph.D., DIET Department, Sapienza University of Rome, 2016.
- PhD Student **Pasquale Vecchiarelli**, *Parameter estimation of 2D polynomial phase signals: an application to moving target imaging with SAR*, Ph.D., DIET Department, Sapienza University of Rome, 2013.
- Master Student **Alessandro Bruner**, *Adaptive focusing of moving target in SAR images*, M.Sc., Communication Engineering, Sapienza University of Rome, 2012.
- Master Student **Alessandro Silvi**, *Detection of moving targets from satellite with SAR/STAP processing*, M.Sc., Communication Engineering, Sapienza University of Rome, 2012.
- Master Student **Marco Omilipo**, *Decentralized topology control in wireless networks*, M.Sc., Communication Engineering, Sapienza University of Rome, 2010.
- Master Student **Simone Magolati**, *Squinted enhanced spotlight for high resolution-wide swath imaging*, M.Sc., Communication Engineering, Sapienza University of Rome, 2009.

TALKS

- May 2016 **Signal Processing and Optimization Methods for Big Data Analytics**, *Dept. of Information engineering, Electronics, and Telecommunications, Sapienza University of Rome.*
- April 2016 **Signal Processing and Optimization Methods for Big Data Analytics**, *Department of Engineering, University of Perugia, Italy.*
- June 2015 **Distributed Optimization and Learning over Networks**, *Department of Engineering, University of Perugia, Italy.*
- May 2015 **Distributed Optimization and Learning over Networks**, *Dept. of Information engineering, Electronics, and Telecommunications, Sapienza University of Rome.*
- June 2012 **Bio-Inspired Swarming for Decentralized Radio Access in Cognitive Networks**, *GTTI annual meeting, Villasimius, June 2012.*

PRESENTATIONS AT CONFERENCES

- 2016 **IEEE ASILOMAR**, *Conference on signals, systems, and computers.*
- 2016 **EURASIP EUSIPCO**, *European signal processing conference.*
- 2015 **IEEE CAMSAP**, *IEEE Work. on comput. advances in multi-sensor adaptive proc.*
- 2014 **IEEE ICASSP**, *IEEE International conference on acoustics, speech and signal processing.*
- 2013 **IEEE ICASSP**, *IEEE International conference on acoustics, speech and signal processing.*
- 2013 **EURASIP EUSIPCO**, *European signal processing conference.*

- 2012 **IEEE ICASSP**, *IEEE International conference on acoustics, speech and signal processing*.
- 2011 **IEEE CAMSAP**, *IEEE Work. on comput. advances in multi-sensor adaptive proc.*
- 2011 **EURASIP EUSIPCO**, *European signal processing conference*.
- 2011 **IEEE ICASSP**, *IEEE International conference on acoustics, speech and signal processing*.
- 2010 **IEEE SPAWC**, *IEEE Workshop on signal processing advances on wireless communications*.

PROFESSIONAL ACTIVITIES

- Editorial activities **Associate Editor**, *Eurasip Journal on Advances in Signal Processing*, since Sept. 2016.
- Reviews **External reviewer**, *IEEE Transactions on Signal Processing*, *IEEE Signal Processing Magazine*, *IEEE Transactions on Signal and Information Processing over Networks*, *IEEE Transactions on Information Theory*, *IEEE Transactions on Wireless Communications*, *IEEE Signal Processing Letters*, *IEEE Communication Letters*, *IEEE Transactions on Communications*, *IEEE Transactions on Aerospace and Electronic Systems*, *IEEE Transactions on Geoscience and Remote Sensing*, *IEEE Transactions on Computers*, *Elsevier Signal Processing*, *Eurasip Journal on Advances on Signal Processing*, *IEEE ICASSP 2011-2016*, *IEEE SPAWC 2011-2016*, *IEEE CAMSAP 2011-2015*, *IEEE SSP 2012-2016*, *IEEE SAM 2012-2016*, *Eurasip Eusipco 2011-2016*.
- TPC **Technical committee member**, *IEEE SPAWC 2013*, *IEEE MLSP 2016*, *IEEE GlobalSIP 2016*, *IEEE GlobalSIP 2017*.
- Memberships **Member**, *IEEE Signal Processing society*, since 2010.
Member, *EURASIP European Signal Processing society*, since 2011.
- Ph.D. comm. **Ph.D committee**, *Universitat Politècnica de Catalunya*, 2014.

RESEARCH ACTIVITIES

His primary research interests are in the areas of: signal processing theory and methods, optimization and learning algorithms for intelligent networked systems, communication and sensor networks, big data analytics, adaptive systems, graph theory, and synthetic aperture radar systems. A brief description of current research topics is given in the sequel.

- **Graph Signal Processing:** Over the last few years, there was significant interest in the development of processing tools for the analysis of signals defined over a graph. This interest is well motivated by the many potential applications ranging from big data to communication networks, social networks, molecular and gene regulatory networks, etc. Graph signal processing (GSP) extends classical discrete-time signal processing to signals defined over a discrete domain having a very general structure, represented by a graph, which subsumes discrete-time as a very simple case. In this research area, we have provided a class of graph signals maximally concentrated in the graph domain and its dual. Building on this framework, we have derived an uncertainty principle for graph signals, and illustrated an interesting link between uncertainty and sampling, thus proposing alternative signal recovery algorithms. Also, for the first time in the literature, we have merged the well established theory of adaptive filtering with the emerging field of GSP. In particular, we have proposed least mean squares strategies for adaptive estimation of band-limited graph signals, which enable adaptive reconstruction, with guaranteed performance in terms of mean-square error, from a limited number of observations sampled over a subset of vertices. The method was finally extended to a distributed setting, where graph nodes communicate over local neighborhoods to pursue the adaptive inference task.
- **Adaptation and Learning over Complex Networks:** In recent years, several research efforts to decipher the intricacies of complex networks have been progressing almost independently across several disciplines, including signal processing, machine learning, optimization, control, statistics, physics, biology, economics, computer science, and social sciences. In this broad context, we have designed several learning algorithms for adaptive networks, which are composed of a set of nodes equipped with local processing and communication units, whose aim is to collectively pursue an inference task of interest from noisy measurements by relying solely on in-network processing. In such implementations, the nodes exchange information locally and cooperate with each other without the need for a central processor. In this way, information is processed on the fly by all nodes and the data diffuse across the network by means of a real-time sharing mechanism. The resulting adaptive networks fully exploit the time and spatial-diversity of the data, thus endowing networks

with powerful learning and tracking abilities. Specific applications of the proposed methods include inference and learning over Gaussian Markov random fields, sparsity-aware distributed online strategies, and adaptive methods for the estimation and control of the algebraic connectivity of random graphs.

- **Mobile Edge Computing for 5G Networks:** Computation offloading has attracted a lot of research efforts as a way to augment the capabilities of resource constrained and energy-hungry mobile handsets by migrating computation to more resourceful servers. Offloading is useful either to enable smartphones to run more and more sophisticated applications, while meeting strict delay constraints, or to prolong the battery lifetime by limiting the energy spent at the mobile handset to run a given application, still under application dependent delay constraints. One of the limitations of today mobile cloud computing is the latency experienced in the propagation of information through a wide area network (WAN). To overcome this limitation, within the FP7 European Project named TROPIC, we have proposed an alternative approach merging the concepts of small cell networks with cloud computing into the so called femto-cloud computing. The idea is to endow small cell base stations with cloud functionalities, thus providing mobile user equipments (MUE's) with proximity access to the cloud. In this scenario, we have proposed a mobile computation offloading framework operating jointly over the communication and computation aspects. In particular, the goal is to devise offloading strategies that minimize the energy consumption at the MUE under radio and computational constraints. This research is currently pursued within a Europe-Japan Horizon 2020 project, entitled 5G MiEdge: Millimeter-wave Edge cloud as an enabler for 5G ecosystem.
- **In-Network Distributed Optimization:** Research in this context pursues an ambitious and challenging goal: Targeting provable convergent, low-complexity, distributed solution methods for a very general class of (continuous) nonconvex (nonsmooth) programs defined over networks/graphs. Instances of such a general formulations arise in many fields of engineering, including sensor networks information processing, communication networks, multi-agent control and coordination, and distributed machine learning, just to name a few. Our main contribution in this context is a new convergent and distributed algorithmic framework for the aforementioned general formulation; we denominated it as in-Network successive convex approximation algorithm (NEXT). NEXT represents the first algorithmic framework for the distributed minimization of the sum of a smooth (possibly nonconvex) function-the agents' sum-utility-plus a convex (possibly nonsmooth) regularizer. The crux of the framework is a novel convexification-decomposition technique that hinges on (primal) Successive Convex Approximation (SCA) methods, while leveraging dynamic consensus as a mechanism to distribute the computation as well as propagate the needed information over the network. NEXT naturally leads to distributed (i.e., nodes have only local knowledge of the problem) and parallel (i.e., computation at each node is split among different cores) implementations for the solution of general nonconvex, nonsmooth optimization problems defined over multi-agent networks.
- **Bio-Inspired Signal and Information Processing:** There is strong trend, in current research on communication and sensor networks, to study self-organizing, self-healing systems. As testified by by swarming behaviors, brain activity, and so on, biological networks offers many examples of self-organization and self-healing. It is then of great interest to derive mathematical models of biological systems and see how they can suggest novel design tools for engineers. In our recent works, inspired by biological models of social foraging swarms, we have formulated the problem of radio resource allocation in cognitive networks as the search for food by a flock of birds swarming in a cooperative manner, but without any centralized control. The interference distribution in the time-frequency plane takes the role of the food spatial distribution: The birds (radio nodes) fly (allocate their resources) over the regions (time-frequency domain) where there is more food (less interference). During the flight, the birds move (choose their time-frequency slots) in a coordinated way, in order to avoid collisions (conflicts over common radio resources), yet maintaining the swarm cohesion (i.e., enforcing spatial reuse of the channels). The solution is given as the distributed minimization of a functional, borrowed from social foraging swarming models, containing the average interference plus repulsion and attraction terms that help to avoid conflicts and maintain cohesiveness, respectively.

PUBLICATIONS

JOURNAL PAPERS

- [J1] S. Sardellitti, S. Barbarossa, and P. Di Lorenzo, *On the Graph Fourier Transform for Directed Graphs*, IEEE Journal of Selected Topics in on Signal Processing, vol. 11, no. 6, Sept. 2017.

- [J2] P. Di Lorenzo, P. Banelli, S. Barbarossa, and S. Sardellitti, *Distributed Adaptive Learning of Graph Signals*, IEEE Transactions on Signal Processing, Vol. 65, no. 16, pp. 4193-4208, Aug. 2017.
- [J3] S. Scardapane and P. Di Lorenzo, *A Framework for Parallel and Distributed Training of Neural Networks*, Neural Networks, Vol. 91, pp. 42-54, July 2017.
- [J4] P. Di Lorenzo, S. Barbarossa, P. Banelli, and S. Sardellitti, *Adaptive Least Mean Squares Estimation of Graph Signals*, IEEE Transactions on Signal and Information Processing over Networks, vol. 2, no. 4, Dec. 2016.
- [J5] M. Tsitsvero, S. Barbarossa, and P. Di Lorenzo, *Signals on Graphs: Uncertainty Principle and Sampling*, IEEE Transactions on Signal Processing, vol. 64, no. 18, pp. 4845-4860, Sept. 2016.
- [J6] S. Scardapane, R. Fierimonte, P. Di Lorenzo, M. Panella, and A. Uncini, *Distributed Semi-supervised Support Vector Machines*, Elsevier Neural Networks, vol. 80, pp. 43-52, Aug. 2016.
- [J7] P. Di Lorenzo and G. Scutari, *NEXT: In-Network Nonconvex Optimization*, IEEE Transactions on Signal and Information Processing over Networks, vol. 2, no. 2, pp. 120-136, June 2016.
- [J8] P. Di Lorenzo, *Diffusion Adaptation Strategies for Distributed Estimation over Gaussian Markov Random Fields*, IEEE Trans.on Signal Processing, vol. 62, no. 21, pp. 5748-5760, Nov. 2014.
- [J9] S. Barbarossa, S. Sardellitti, and P. Di Lorenzo, *Communicating while Computing: Distributed Mobile Cloud Computing over 5G Heterogeneous Networks*, IEEE Signal Processing Magazine, vol. 31, no. 6, pp. 45-55, Nov. 2014.
- [J10] P. Di Lorenzo and S. Barbarossa, *Distributed Estimation and Control of Algebraic Connectivity over Random Graphs*, IEEE Transactions on Signal Processing, vol. 62, no. 21, pp. 5615-5628, Nov. 2014.
- [J11] S. Barbarossa, P. Di Lorenzo, and P. Vecchiarelli, *Parameter Estimation of 2D Multi-Component Polynomial Phase Signals: An Application to SAR Imaging of Moving Targets*, IEEE Transactions on Signal Processing, vol. 62, no. 17, pp. 4375-4389, Sept. 2014.
- [J12] P. Di Lorenzo, S. Barbarossa, and Ali H. Sayed, *Distributed Spectrum Estimation for Small Cell Networks based on Sparse Diffusion Adaptation*, IEEE Signal Processing Letters, vol. 20, no. 12, pp. 1261-1265, December 2013.
- [J13] P. Di Lorenzo, S. Barbarossa, and Ali H. Sayed, *Bio-Inspired Decentralized Radio Access based on Swarming Mechanisms over Adaptive Networks*, IEEE Transactions on Signal Processing, vol. 61, no. 12, pp. 3183-3197, June 2013.
- [J14] P. Di Lorenzo and S. Barbarossa, *Swarming Algorithms for Distributed Radio Resource Allocation*, IEEE Signal Processing Magazine, vol. 30, no. 3, pp. 144-154, May 2013.
- [J15] P. Di Lorenzo and Ali H. Sayed, *Sparse Distributed Learning Based on Diffusion Adaptation*, IEEE Transactions on Signal Processing, vol. 61, no. 6, pp. 1419-1433, March 2013.
- [J16] P. Di Lorenzo, S. Barbarossa, and M. Omilipo, *Distributed Sum-Rate Maximization over Finite Rate Coordination Links Affected by Random Failures*, IEEE Trans. on Signal Processing, vol. 61, no. 3, pp. 648-660, Feb. 2013.
- [J17] P. Di Lorenzo, S. Barbarossa, and L. Borgarelli, *Optimal beamforming for range/Doppler ambiguity minimization in squinted SAR*, IEEE Transactions on Aerospace and Electronic Systems, vol. 49, no. 1, pp. 277-293, Jan. 2013.
- [J18] P. Di Lorenzo, S. Barbarossa, and Ali H. Sayed, *Decentralized resource assignment in cognitive networks based on swarming mechanisms over random graphs*, IEEE Transactions on Signal Processing, vol. 60, no.7, pp. 3755-3769, July 2012.
- [J19] P. Di Lorenzo and S. Barbarossa, *A bio-inspired swarming algorithm for decentralized access in cognitive radio*, IEEE Transactions on Signal Processing, vol. 59, no.12, pp. 6160-6174, December 2011.

CONFERENCE PROCEEDINGS

- [C1] P. Di Lorenzo, P. Banelli, S. Barbarossa, *Optimal Sampling Strategies for Adaptive Learning of Graph Signals*, Proc. of EURASIP Eusipco, Kos, Greece, Aug.-Sept. 2017.
- [C2] P. Di Lorenzo, E. Isufi, P. Banelli, S. Barbarossa, G. Leus, *Distributed Recursive Least Squares Strategies for Adaptive Reconstruction of Graph Signals*, Proc. of EURASIP Eusipco, Kos, Greece, Aug.-Sept. 2017.
- [C3] S. Sardellitti, S. Barbarossa, P. Di Lorenzo, *Graph Fourier Transform for Directed Graphs based on Lovász Extension of Min-Cut*, Proc. of IEEE ICASSP, New Orleans, USA, 2017.
- [C4] S. Sardellitti, S. Barbarossa, and P. Di Lorenzo, *Graph topology inference based on transform learning*, Proc. of IEEE GlobalSIP, Washington, Dec. 2016. **Invited paper.**
- [C5] P. Di Lorenzo, S. Barbarossa, P. Banelli, and S. Sardellitti, *Distributed Adaptive Learning of Signals defined over Graphs*, Proc. of IEEE Asilomar Conference, Pacific Grove, Nov. 2016. **Invited paper.**
- [C6] P. Di Lorenzo and S. Scardapane, *Parallel And Distributed Training Of Neural Networks Via Successive Convex Approximation*, Proc. of IEEE Workshop on Machine Learning for Signal Processing, Salerno, Sept. 2016.
- [C7] P. Di Lorenzo, S. Barbarossa, P. Banelli, and S. Sardellitti, *LMS Estimation of Signals defined over Graphs*, European Signal Processing Conference, Budapest, Aug. 2016.
- [C8] P. Di Lorenzo and G. Scutari, *Distributed Nonconvex Optimization over Time-Varying Networks*, Proc. of IEEE Intern. Conference on Acoustics, Speech and Signal Processing, Shanghai, China, March 2016.
- [C9] P. Di Lorenzo and G. Scutari, *Distributed Nonconvex Optimization Over Networks*, IEEE International Workshop on Computational Advances in Multi-Sensor Adaptive Processing, Cancun, Dec. 2015.
- [C10] M. Tsitsvero, S. Barbarossa, and P. Di Lorenzo, *Uncertainty Principle and Sampling of Signals Defined on Graphs*, Proc. of IEEE Asilomar Conference, Pacific Grove, Nov. 2015. **Invited paper.**
- [C11] S. Barbarossa, P. Di Lorenzo, and M. van der Schaar, *Network Formation Games based on Conditional Independence Graphs*, Proc. of IEEE Intern. Conference on Acoustics, Speech and Signal Processing, Brisbane, 2015.
- [C12] S. Barbarossa, P. Di Lorenzo, and S. Sardellitti, *Computation Offloading Strategies based on Energy Minimization under Computational Rate Constraints*, European Conference on Networks and Communications, Bologna, Italy, June 2014.
- [C13] P. Di Lorenzo and S. Barbarossa, *Distributed Least-Mean Squares Strategies for Sparsity-Aware Estimation over Gaussian Markov Random Fields*, Proc. of IEEE International Conference on Acoustics, Speech and Signal Processing, Florence, Italy, May 2014.
- [C14] Eduardo Makhoul, Yu Zhan, Francisco Ceba, Antoni Broquetas, Alasdair Beaton, Federico Letterio, Stefania Tonetti, Sergio Barbarossa, Paolo Di Lorenzo, Marco Maffei, *Fast Simulation Performance Evaluation of Spaceborne SAR-GMTI Missions for Maritime Applications*, Proc. 10th European Conference on Synthetic Aperture Radar, Berlin, June 2014.
- [C15] F. Letterio, S. Tonetti, F. Ceba, Y. Zhan, E. Makhoul, A. Broquetas, M. Maffei, S. Barbarossa, P. Di Lorenzo, A. Beaton, *Satellite Convoy Scenario For Spaceborn MTI in Sea Clutter*, Proc. 1st International Earth Observation Convoy and Constellation Concepts Workshop, ESA-ESTEC, Noordwijk, The Netherlands, October 2013.
- [C16] P. Di Lorenzo and S. Barbarossa, *Distributed control of Wireless Ad-hoc Networks Connectivity incorporating realistic channel models*, Proc. European Signal Processing Conference, Marrakech, Sept. 2013. **Invited paper.**
- [C17] S. Barbarossa, S. Sardellitti, and P. Di Lorenzo, *Joint allocation of computation and communication resources in multiuser mobile cloud computing*, Proc. of IEEE Workshop for Signal Processing Advances in Wireless Communications, Darmstadt, June 2013.

- [C18] S. Barbarossa, S. Sardellitti, and P. Di Lorenzo, *Computation offloading for mobile cloud computing based on wide cross-layer optimization*, Proc. of the Future Network and Mobile Summit, Lisbon, July 2013.
- [C19] P. Di Lorenzo and S. Barbarossa, *Decentralized estimation and control of algebraic connectivity of random ad-hoc networks*, Proc. IEEE Intern. Conference on Acoustics, Speech and Signal Processing, Vancouver, May 2013.
- [C20] S. Barbarossa, P. Di Lorenzo, P. Vecchiarelli, A. Silvi, and A. Bruner, *Parameter Estimation of 2D Polynomial Phase Signals: An Application to Moving Target Imaging with SAR*, Proc. IEEE Intern. Conference on Acoustics, Speech and Signal Processing, Vancouver, May 2013.
- [C21] P. Di Lorenzo, S. Barbarossa, and Ali H. Sayed, *Sparse Diffusion LMS for distributed adaptive estimation*, Proc. IEEE Intern. Conference on Acoustics, Speech and Signal Processing, pp. 3281-3284, Kyoto, Japan, March 2012.
- [C22] P. Di Lorenzo, M. Omilipo, and S. Barbarossa, *Distributed stochastic pricing for sum-rate maximization in femtocell networks with random graph and quantized communications*, Proc. IEEE Workshop on Computational Advances in Multi-Sensor Adaptive Processing, Dec. 2011.
- [C23] P. Di Lorenzo and S. Barbarossa, *Optimal beamforming for range/Doppler ambiguity suppression in squinted SAR systems*, Proc. IEEE Workshop on Computational Advances in Multi-Sensor Adaptive Processing, pp. 169-172, San Juan, Dec. 2011. **IEEE Best Student Paper Award.**
- [C24] P. Di Lorenzo, S. Barbarossa, and Ali H. Sayed, *Bio-inspired swarming for dynamic radio access based on diffusion adaptation*, Proc. European Signal Processing Conference, pp. 402-407, Barcelona, Sept. 2011. **EURASIP Best Student Paper Award.**
- [C25] P. Di Lorenzo, S. Barbarossa, and Ali H. Sayed, *A Bio-inspired fast swarming algorithm for dynamic radio access*, Proc. Digital Signal Processing Conference, pp. 1-6, Corfù, July 2011. **Invited paper.**
- [C26] P. Di Lorenzo and S. Barbarossa, *Bio-Inspired Swarming Models For Decentralized Radio Access Incorporating Random Links And Quantized Communications*, Proc. IEEE International Conference on Acoustics, Speech and Signal Processing, pp. 5780-5783, Prague, May 2011. **Invited paper.**
- [C27] P. Di Lorenzo and S. Barbarossa, *Distributed Resource Allocation In Cognitive Radio Systems Based On Social Foraging Swarms*, Proc. IEEE Workshop for Signal Processing Advances in Wireless Communications, pp. 1-5, Marrakech, June 2010. **IEEE Best Student Paper Award.**

BOOK CHAPTERS

- [B1] S. Barbarossa, S. Sardellitti, and P. Di Lorenzo, *Distributed Detection and Estimation in Wireless Sensor Networks*, Academic Press Library in Signal Proc., Vol. 2, Commun. and Radar Signal Processing, pp. 329-408, 2014.

SUBMITTED PAPERS

- [SJ1] S. Scardapane and P. Di Lorenzo, *Stochastic Training of Neural Networks via Successive Convex Approximations*, submitted to IEEE Transactions on Neural Networks and Learning Systems, 2017.
- [SJ2] P. Di Lorenzo, P. Banelli, E. Isufi, S. Barbarossa, and G. Leus, *Adaptive Graph Signal Processing: Algorithms and Optimal Sampling Strategies*, submitted to IEEE Transactions on Signal Processing, Sept. 2017.

REFERENCES

These persons are familiar with my professional qualifications and my character:

◦ **Prof. Sergio Barbarossa**

Department of Information Engineering, Electronics, and Telecommunications,
Sapienza University of Rome via Eudossiana 18, 00184, Rome, Italy
e-mail: sergio.barbarossa@uniroma1.it

◦ **Prof. Ali H. Sayed**

Electrical Engineering Department, University of California, Los Angeles, CA 90095-1594
e-mail: sayed@ee.ucla.edu

◦ **Prof. Gesualdo Scutari**

Department of Industrial Engineering, Purdue University, West Lafayette, IN, 47907-5400
e-mail: gscutari@purdue.edu

◦ **Prof. Paolo Banelli**

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“Treatment of personal information is authorized according to the local privacy laws (D. Lgs 196/2003)”.

Rome, 18/09/2017