Evangelos Vlachos

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Summary

Evangelos Vlachos received the Diploma degree in Computer Engineering and Informatics, the MSc degree in Signal Processing and Telecommunications and the PhD degree in Signal Processing for Wireless Communications from University of Patras (UoP), Greece, in 2005, 2009 and 2015, respectively. From 2015 to 2016 was a post-doctoral researcher at the Laboratory of Signal Processing and Telecommunications in Computer Engineering and Informatics (SPClab, UoP), working on distributed signal processing over networks. During 2016 worked as a post-doctoral researcher at the Visualization and Virtual Reality Group (VVRgroup, UoP), on graph signal processing and received best paper award from IEEE ICME2017. From 2017 to 2019, he worked as research associate at the Institute for Digital Communications (IDCOM, University of Edinburgh), on low complexity signal processing for millimeter wave and next generation wireless communications. In 2019, was elected as a Research Assistant Professor (Researcher Grade C) on intelligent control for industrial and cyber-physical systems at Industrial Systems Institute, ATHENA Research Centre, in Patras, Greece. He has published 12 journals (6 as a first author) and 24 conferences (11 as a first author). He has participated in 6 research projects funded by EU.

Areas of Expertise

Signal processing for communications; distributed learning and optimization; low-complexity and energy-efficient designs for multiple-input multiple-output systems; millimiter wave communications; non-linear dynamic programming; sparse and graph signal processing.

Qualifications

2009-2015	**Ph.D.** in Wireless Communications and Signal Processing, University of Patras, Greece. Dissertation: *Efficient tranceiver techniques for interference and fading mitigation in wireless communication systems*, Supervisor: Prof. K. Berberidis , Degree: 10/10.
2006-2009	**M.Sc.** in Information Processing and Machine Learning, University of Patras, Greece. Thesis: *Adaptive techniques for V-BLAST like receivers for MIMO systems*, Supervisor: Prof. K. Berberidis, Degree: 10/10.
1999-2005	**Diploma** of Computer Engineering and Informatics, University of Patras, Greece. *Analysis and Implementation of Equalization Methods for MIMO systems in Frequency Domain*, Supervisor: Prof. K. Berberidis, Degree: 8/10.

Work/Research Experience

2019-now	**Research Assistant Professor** (Researcher Grade C) *Industrial Systems Institute (ISI), ATHENA Research Center, Greece.*
2017-2019	**Post-doctoral research associate**, Institute for Digital Communications *School of Engineering, University of Edinburgh, UK.*
2016-2017	**Post-doctoral research associate**, Visualization and Virtual Reality Group *Department of Electrical & Computer Engineering, University of Patras, Greece.*
2015-2016	**Post-doctoral research associate**, Signal Processing and Communications Lab *Department of Computer Engineering and Informatics, University of Patras, Greece.*

Awards

2017	First author for "World's FIRST 10K Best Paper Award - Platinum Award" on efficient graph-based matrix completion of incomplete animated 3D point-clouds.
2009	Excellence award for my M.Sc. studies.

Collaboration with Industry

Research collaboration with Mathematical and Algorithmic Sciences Lab, Huawei Technologies France.

Grant Applications

2019	**UKRI FLF** (Fellowship proposal) as a Principal Investigator
	EPSRC - Bilateral (*Joint research proposal with University of Luxembourg*) as a co-Principal Investigator
2018	**PECRE** (*Postgraduate and Early Career Researcher Exchanges*)
2017	**ELIDIK** (*Early Career Researcher Funding*)
	MEMORIES (*Meaningful Ethnography Metadata Object Retrieval & Information Extraction System*)
2016	**FestiVate** (*A social Telemedia platform for sharing experiences of cultural and entertainement events*)
2015	**COM-MED** (*COMMunication systems with renewable Energy micro-grid*)
	Funded by FP7 ERANET-MED, 4 partners
2013	**GRIC** (*Smart Grid Renewables Integration: Communication and Information Processing Issues*)
	Funded by FP7, collaboration with SUPELEC
2012	**ENDECON** (*Energy efficient Design of Communications Networks*)

Funded by the Greek General Secretariat for Research and Technology, 4 partners

Research Grants

2017–2020	**EPSRC Project** (University of Edinburgh, UK) *Low-complexity processing for mm-Wave massive MIMO*
2016–2017	**myAirCoach** (European Horizon H2020) *Analysis, modelling and sensing of both physiological and environmental factors for the customized and predictive self-management of Asthma*
2015–2016	**HANDiCAMS** (European FP7 FET) *Heterogeneous Ad-Hoc Networks for Distributed, Cooperative, and Adaptive Multimedia Signal Processing*
2012–2015	**ENDECON** (Greek program THALES) *Energy efficient Design of Communications Networks*
2013–2015	**GRIC** (Greece – French bilateral project) *Smart Grid Renewables Integration: Communication and Information Processing Issues*
2011–2013	**THERMOCAMERA** (Collaboration with Cyprus) *Development of a handheld thermal imaging device for inspection of structures*

Teaching Experience

2019	**Co-supervisor** of PhD student, University of Edinburgh, UK. **Lecturing** undergraduate course (advanced coding techniques) at the School of Engineering, University of Edinburgh, Scotland, UK.
2018	**Tutoring** undergraduate courses (mathematics) at the School of Engineering, University of Edinburgh, Scotland, UK.
2013 - 2015	**Teaching assistant and tutoring** undergraduate courses (digital communications, signal/image processing) at the Department of Computer Engineering and Informatics, University of Patras, Greece.
2011-2013	**Adjunct Lecturer** on undergraduate courses (digital signal processing, privacy and security) at the Technological Education Institute of Patras, Greece.
2012 - 2018	**Co-supservisor** of MSc students at University of Patras (G. Lionas, E. Adamidi and C. Koulis) and at University of Edinburgh (A. Kaushik)
2016	**eLearning tutoring** for undergraduate eclass on Digital Communications. Preparation and creation of online multimedia material.

Invited talks

2018	Signal Processing and expertise In Networking and Communication (SPiN-COM), University of Minnesota, on *"Low Complexity Processing for Millimeter Wave Massive MIMO"*.
2017	Aerospace Science and Technology and Technology Group, **Beihang University**, on *"Millimeter wave massive MIMO communications with low-resolution ADCs/DACs"*.

Visiting scholar

Feb. 2020	Visitor at University of Edinburgh (UK) working on energy efficient mmWave communications via position-aided beamforming.
Jul. 2019	Visitor at the Interdisciplinary Centre for Security, Reliability and Trust (SnT), Luxembourg.
Jul. 2018	Visitor at the Signal Processing and expertise In Networking and Communication (SPiN-COM) group of Prof. G. Giannakis at the University of Minnesota, Minneapolis, USA.

Other Profesional Activities

Co-organizer of Special Session in Societal Automation Conferernce, 2019.

Reviewer for several international journals and conferences: IEEE Transactions on Communications, IEEE Transactions on Wireless Communications, IEEE Transactions on Vehicular Technology, IEEE Signal Processing Letters, EURASIP Journal on Advances in Signal Processing, IET Communications, and conferences.

Technical Skills

MATLAB, Julia Lang, Software Defined Radios (USRP), Python, C/C++, LabView, Linux

Publications List

Under Review/Preparation

2021	**[J15]** E. Vlachos and A. Lalos. Model-Predictive-Control for Cooperative Platooning of CAVs over Next-Generation Vehicular Networks. *IEEE Transactions on Intelligent Transportation Systems*, 2021

[J14] E. Vlachos, G. Alexandropoulos, and P. Kolios. Position-Aided Millimeter Wave MIMO Channel Estimation for UAV Communications in the Presence of the Beam Squint Effect . *IEEE Journal on Selected Areas in Communications - Special Issue on UAV Communications in 5G and Beyond Networks, Nov. 2020 (Submitted)*, 2021a

Published Journals

2020 **[J13]** E. Vlachos, J. Thompson, A. Kaushik, and C. Masouros. RF-Chain Selection for Energy and Spectral Efficiency Maximisation in Hybrid Beamforming under Hardware Imperfections. *The Royal Society Publishing*, 2021b

[J12] E. Vlachos and J. Thompson. Energy-Efficiency Maximization of Hybrid Massive MIMO Precoding with Random-Resolution DACs via RF Selection. *IEEE Transactions on Wireless Communications*, pages 1–1, 2020. URL https://doi.org/10.1109/TWC.2020.3030772

[J11] A. Kaushik, E. Vlachos, C. Tsinos, J. Thompson, and S. Chatzinotas. Joint Bit Allocation and Hybrid Beamforming Optimization for Energy Efficient Millimeter Wave MIMO Systems. *IEEE Transactions on Green Communications and Networking*, pages 1–1, 2020. URL https://doi.org/10.1109/TGCN.2020.3026725

[J10] A. S. Lalos, E. Vlachos, K. Berberidis, A. Fournaris, and C. Koulamas. Robust and Efficient Privacy Preservation in Industrial IoT via correlation completion and tracking. 1:1225–1228, 2019c. URL https://doi.org/10.1109/INDIN41052.2019.8972154

2019 **[J9]** E. Vlachos, G. Alexandropoulos, and J. S. Thompson. Wideband MIMO channel estimation for hybrid beamforming millimeter wave systems via random spatial sampling. *IEEE Journal of Selected Topics in Signal Processing*, pages 1–1, 2019a. ISSN 1932-4553. URL https://doi.org/10.1109/JSTSP.2019.2937633

[J8] A. Kaushik, J. Thompson, E. Vlachos, C. Tsinos, and S. Chatzinotas. Dynamic RF Chain Selection for Energy Efficient and Low Complexity Hybrid Beamforming in Millimeter Wave MIMO Systems. *IEEE Transactions on Green Communications and Networking*, pages 1–1, 2019a. ISSN 2473-2400. URL https://doi.org/10.1109/TGCN.2019.2931613

[J7] A. S. Lalos, E. Vlachos, G. Arvanitis, K. Moustakas, and K. Berberidis. Signal processing on static and dynamic 3d meshes: Sparse representations and applications. *IEEE Access*, 7:15779–15803, 2019b. ISSN 2169-3536. URL https://doi.org/10.1109/ACCESS.2019.2894533

2018 **[J6]** E. Vlachos, George C. Alexandropoulos, and J. Thompson. Massive MIMO channel estimation for millimeter wave systems via matrix completion. *IEEE Signal Processing Letters*, 2018. URL https://doi.org/10.1109/LSP.2018.2870533

[J5] E. Vlachos, A. S. Lalos, A. Spathis-Papadiotis, and K. Moustakas. Distributed consolidation of highly-incomplete dynamic point clouds based on rank minimization. *IEEE Transactions on Multimedia*, pages 1–1, 2018b. ISSN 1520-9210. doi: 10.1109/TMM. 2018.2839911. URL http://dx.doi.org/10.1109/TMM.2018.2839911

[J4] E. Vlachos, A. S. Lalos, K. Berberidis, and J. Thompson. Adaptive windowing for ICI mitigation in vehicular communications. *IEEE Wireless Communications Letters*, pages 1–1, 2018a. ISSN 2162-2337. URL http://dx.doi.org/10.1109/LWC.2018.2842226

2016   **[J3]** A. Lalos, I. Nikolas, E. Vlachos, and K. Moustakas. Compressed sensing for efficient encoding of dense 3D Meshes using model based Bayesian learning. *IEEE Transactions on Multimedia*, PP(99):1–1, 2016. ISSN 1520-9210. doi: 10.1109/TMM.2016.2605927. URL http://dx.doi.org/10.1109/TMM.2016.2605927

[J2] E. Vlachos, A. S. Lalos, and K. Berberidis. Low-complexity OSIC equalization for OFDM-based vehicular communications. *IEEE Transactions on Vehicular Technology*, PP (99):1–1, 2016. ISSN 0018-9545. doi: 10.1109/TVT.2016.2598185. URL http://dx.doi.org/10.1109/TVT.2016.2598185

2012   **[J1]** E. Vlachos, A.S. Lalos, and K. Berberidis. Stochastic gradient pursuit for adaptive equalization of sparse multipath channels. *IEEE Journal on Emerging and Selected Topics in Circuits and Systems*, 2(3):413–423, 2012-09. ISSN 2156-3357. doi: 10.1109/JETCAS. 2012.2214631. URL http://dx.doi.org/10.1109/JETCAS.2012.2214631

Conferences

2020   **C24** G. Alexandropoulos, E. Vlachos, and B. Smida. Joint Localization and Channel Estimation for UAV-assisted Millimeter Wave Communications. In *Asilomar Conference on Signals, Systems, and Computers*, 2020

C23 G. C. Alexandropoulos and E. Vlachos. A hardware architecture for reconfigurable intelligent surfaces with minimal active elements for explicit channel estimation. In *ICASSP 2020 - 2020 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, pages 9175–9179, 2020. URL https://doi.org/10.1109/ICASSP40776.2020.9053976

C22 G. C. Alexandropoulos, E. Vlachos, and J. Thompson. Wideband channel tracking for millimeter wave massive mimo systems with hybrid beamforming reception. In *ICASSP 2020 - 2020 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, pages 8698–8702, 2020. URL https://doi.org/10.1109/ICASSP40776.2020.9053440

C21 A. S. Lalos, E. Vlachos, K. Berberidis, A. Fournaris, and C. Koulamas. Robust and Efficient Privacy Preservation in Industrial IoT via correlation completion and tracking. In *2019 IEEE 17th International Conference on Industrial Informatics (IN-DIN)*, volume 1, pages 1225–1228, 2019d. URL https://doi.org/10.1109/INDIN41052.2019.8972154

2019

[C20] A. Kaushik, C. Tsinos, E. Vlachos, and J. Thompson. Energy Efficient ADC Bit Allocation and Hybrid Combining for Millimeter Wave MIMO Systems. In *2019 IEEE Global Communications Conference (GLOBECOM)*, pages 1–6, 2019b. URL https://doi.org/10.1109/GLOBECOM38437.2019.9014072

[C19] A. Lalos, G. Arvanitis, E. Vlachos, and K. Moustakas. Energy Efficient Transmission of 3D Meshes Over mmWave-Based Massive MIMO Systems. In *2019 IEEE International Conference on Multimedia and Expo (ICME)*, pages 1714–1719, 2019a. URL https://doi.org/10.1109/ICME.2019.00295

[C18] E. Vlachos, G. C. Alexandropoulos, and J. Thompson. Hybrid Beamforming with Random Analog Sampling for Wideband Channel Estimation in Millimeter Wave Massive MIMO Systems. In *2019 IEEE 20th International Workshop on Signal Processing Advances in Wireless Communications (SPAWC)*, pages 1–5, 2019b. URL https://doi.org/10.1109/SPAWC.2019.8815512

[C17] E. Vlachos, J. Thompson, M. A. Babar Abbasi, V. F. Fusco, and M. Matthaiou. Robust Estimator for Lens-based Hybrid MIMO with Low-Resolution Sampling. In *2019 IEEE 20th International Workshop on Signal Processing Advances in Wireless Communications (SPAWC)*, pages 1–5, 2019c. URL https://doi.org/10.1109/SPAWC.2019.8815573

[C16] A. Kaushik, E. Vlachos, and J. Thompson. Energy Efficiency Maximization of Millimeter Wave Hybrid MIMO Systems with Low Resolution DACs. In *ICC 2019 - 2019 IEEE International Conference on Communications (ICC)*, pages 1–6, 2019c. URL https://doi.org/10.1109/ICC.2019.8761357

2018

[C15] A. Kaushik, E. Vlachos, J. Thompson, and A. Perelli. Efficient channel estimation in millimeter wave hybrid mimo systems with low resolution ADCs. In *2018 26th European Signal Processing Conference (EUSIPCO)*, pages 1825–1829, Sep. 2018. URL http://dx.doi.org/10.23919/EUSIPCO.2018.8553303

[C14] E. Vlachos, A. Kaushik, and J. Thompson. Energy efficient transmitter with low resolution dacs for massive mimo with partially connected hybrid architecture. In *2018 IEEE 87th Vehicular Technology Conference (VTC Spring)*, pages 1–5, June 2018. URL http://dx.doi.org/10.1109/VTCSpring.2018.8417650

[C13] E. Vlachos and J. Thompson. Dithered beamforming for channel estimation in mmwave-based massive mimo. In *2018 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, pages 3604–3608, April 2018. URL http://dx.doi.org/10.1109/ICASSP.2018.8461911

2017   **[C12]** E. Vlachos, A. S. Lalos, K. Moustakas, and K. Berberidis. Efficient graph-based matrix completion on incomplete animated models. In *2017 IEEE International Conference on Multimedia and Expo (ICME)*, pages 1548–1553, July 2017b. doi: 10.1109/ICME.2017.8019502. URL http://dx.doi.org/10.1109/ICME.2017.8019502

[C11] E. Vlachos, A. S. Lalos, K. Berberidis, and C. Tselios. Autonomous driving in 5g: Mitigating interference in ofdm-based vehicular communications. In *2017 IEEE 22nd International Workshop on Computer Aided Modeling and Design of Communication Links and Networks (CAMAD)*, pages 1–6, June 2017a. URL https://doi.org/10.1109/CAMAD.2017.8031619

2016   **[C10]** E. Vlachos and K. Berberidis. Adaptive completion of the correlation matrix in wireless sensor networks. In *24th European Signal Processing Conference, EUSIPCO 2016, Budapest, Hungary, August 29 - September 2, 2016*, pages 1403–1407, 2016a. doi: 10.1109/EUSIPCO.2016.7760479. URL https://doi.org/10.1109/EUSIPCO.2016.7760479

[C9] E. Vlachos and K. Berberidis. Blind distributed beamforming via matrix completion. In *2016 IEEE 17th International Workshop on Signal Processing Advances in Wireless Communications (SPAWC)*, pages 1–6, July 2016b. URL https://doi.org/10.1109/SPAWC.2016.7536750

[C8] C. Mavrokefalidis, D. Ampeliotis, E. Vlachos, K. Berberidis, and E. Varvarigos. Supervised energy disaggregation using dictionary-based modelling of appliance states. In *2016 IEEE PES Innovative Smart Grid Technologies Conference Europe (ISGT-Europe)*, pages 1–6, Oct 2016. URL https://doi.org/10.1109/ISGTEurope.2016.7856277

2013   **[C7]** E. Vlachos, A.S. Lalos, and K. Berberidis. Galerkin projections-based ICI cancellation in OFDM systems with doubly selective channels. In *18th International Conference on Digital Signal Processing (DSP)*, pages 1–6, Jul. 2013. URL https://dx.doi.org/10.1109/ICDSP.2013.6622686

[C6] E. Vlachos, A.S. Lalos, and K. Berberidis. Regularized MMSE ICI equalization for OFDM systems over doubly selective channels. In *IEEE International Symposium on Signal Processing and Information Technology*, pages 458–463, 2013-12. URL https://doi.org/10.1109/ISSPIT.2013.6781924

[C5] C. G. Tsinos, E. Vlachos, and K. Berberidis. Distributed blind adaptive computation of beamforming weights for relay networks. In *IEEE 24th International Symposium on Personal Indoor and Mobile Radio Communications (PIMRC)*, pages 570–574, Sept. 2013. URL https://doi.org/10.1109/PIMRC.2013.6666201

[C4] V. Kekatos, E. Vlachos, D. Ampeliotis, G. Giannakis, and K. Berberidis. A decentralized approach to generalized power system state estimation. In *IEEE 5th International Workshop on Computational Advances in Multi-Sensor Adaptive Processing (CAMSAP)*, Dec. 2013. URL https://dx.doi.org/10.1109/CAMSAP.2013.6714011

[C3] E. Adamidi, E. Vlachos, A. Dermitzakis, K. Berberidis, and N. Pallikarakis. A scheme for X-ray medical image denoising using sparse representations. In *IEEE 13th International Conference on Bioinformatics and Bioengineering (BIBE)*, 2013. URL https://dx.doi.org/10.1109/BIBE.2013.6701544

2012   **[C2]** E. Vlachos, A. Lalos, G. Lionas, and K Berberidis. Compressed sensing techniques for decision feedback equalization of sparse wireless channels. In *IEEE 75th Vehicular Technology Conference (VTC Spring)*, 2012. URL https://dx.doi.org/10.1109/VETECS.2012.6240285

2011   **[C1]** A. Lalos, E. Vlachos, K. Berberidis, and A. Rontogiannis. Greedy algorithms for sparse adaptive decision feedback equalization. In *IEEE Signal Processing and Information Technology (ISSPIT)*, 2011. URL https://dx.doi.org/10.1109/ISSPIT.2011.6151567