Curriculum Vitae

Pablo M. Olmos

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Academics

May 2011 **PhD. in Signal Processing and Communications**, *Dissertation title: Expectation-propagation decoding of Low-Density Parity-Check codes*, Universidad de Sevilla.

Dec. 2008 **M.Sc. in Signal Processing and Communications**, *Master Thesis: Gaussian Processes for non-linear equalization and soft LDPC decoding*, Universidad de Sevilla.

Sept. 2007 **B.Sc. in Telecommunication Engineering**, Universidad de Sevilla.

Academic Employment

since Nov. 2015 **Juan de la Cierva research fellow**, Universidad Carlos III de Madrid, Departamento de Teoría de Señal y Comunicaciones.

Jan. 2012 – Sept. 2015 **Visiting Professor (tenure track)**, Universidad Carlos III de Madrid, Departamento de Teoría de Señal y Comunicaciones.

Sept. 2007 – Dec. 2011 **PhD. Assistant**, Universidad de Sevilla, Departamento de Teoría de Señal y Comunicaciones.

Visiting Researcher:.

- Princeton University, New Jersey, USA. July 2009- September 2009.
- École polytechnique fédérale de Lausanne (EPFL), Switzerland. June 2010- September 2010 and July 2012-January 2013.
- University of Notre Dame, Indiana, USA. October 2013-December 2013.
- École Nationale Supérieure de l'Electronique et de ses Applications (ENSEA), France. July 2014.
- Bell Labs, Alcatel-Lucent, New Jersey, USA. September 2015-December 2015.

Selected Publications

I have published 15 papers in high-impact international journals and more than 20 papers in conference proceedings. In the following, I include a list of those I believe are more representative. A full list of publications can be accessed at my personal website.

Approximate Inference and Machine Learning for Digital Communications

Oct. 2009 **Gaussian Processes and its Application to the design of Digital Communication Receivers**, *Application of Machine Learning, Ed. InTech. ISBN: 978-953-307-035-3.*, Pablo M. Olmos, J. J. Murillo-Fuentes and F. Pérez-Cruz.

March 2010 **Joint Nonlinear Channel Equalization and Soft LDPC Decoding with Gaussian Processes**, *IEEE Transactions on Signal Processing. Vol. 58. Pags. 1183-1192*, Pablo M. Olmos, Juan José Murillo Fuentes and Fernando Pérez Cruz.

Dec. 2011 **An Application of Tree-Structured Expectation Propagation for Channel Decoding.**, *Neural Information Processing Systems Foundation* ***(NIPS)****, 2011, Granada, Spain.*, Pablo M. Olmos, Juan José Murillo Fuentes and Fernando Pérez Cruz.

June 2013 **Tree-Structure Expectation Propagation for LDPC Decoding Over the BEC**, *IEEE Transactions on Information Theory, Vol. 59, Number 6, Pages 3354-3377*, Pablo M. Olmos, Juan José Murillo Fuentes and Fernando Pérez Cruz.

Oct. 2014 **Expectation Propagation Detection for High-order High-dimensional MIMO systems**, *IEEE Transactions on Communications, Vol. 62, Number 8, Pages 2840-2849, Agust 2014*, Javier Cespedes, Pablo M. Olmos, Matilde Sánchez Fernández, Fernando Pérez Cruz.

June 2015 **A Scaling Law to Predict the Finite-Length Performance of Spatially-Coupled LDPC Codes**, *IEEE Transactions on Information Theory, Volume 61 , Issue 6, Pages 3164 - 3184*, Pablo M. Olmos, R. Urbanke.

Feb. 2016 **On the Waterfall Performance of Finite-Length SC-LDPC Codes Constructed from Protographs**, *IEEE Journal on Selected Areas in Communications, special issue on recent advances in capacity approaching codes. Volume 34, Issue 2, Pages 345-361, February 2016.*, Markus Stinner, Pablo M. Olmos.

Topics in Machine Learning

June 2015 **Scalable Multi-Output Label Prediction: From Classifier Chains to Classifier Trellises**, *Pattern Recognition, Ed. Elsevier*, Jesse Read, Luca Martino, Pablo M. Olmos, David Luengo.

Feb. 2016 **Infinite Continuous Feature Model for Psychiatric Comorbidity Analysis**, *Neural Computation, MIT Press, Volume 28, Number 2, Pages 354-381, February 2016*, I. Valera, F. J. R. Ruiz, P. M. Olmos, C. Blanco and F. Perez-Cruz.

Patents

Sept. 2012 **Detecting interference in a wireless communication system**, *USA application number: US8260210B2, priority date: 11042010. Patent holder: Vodafone group plc*, Guillermo Esteve Asensio, Francisco Rubio Andrés, Juan José Murillo Fuentes, Pablo M. Olmos.

Invited Talks

Nov. 2015 **Bell Labs (NJ, USA)**, *Expectation propagation for symbol detection in large-scale MIMO communications.*

Oct. 2015 **Klipsch School of Electrical and Computer Engineering, New Mexico State University (USA)**, *An introduction to Approximate Inference via Expectation Propagation.*

Nov. 2014 **Centre National de la Reserche Scientifique in Paris (France)**, *Analyzing Finite-Length Spatially Coupled LDPC Codes Constructed from Protographs.*

Oct. 2014 **German Aerospace Center - DLR**, *Improving the Finite-Length Performance of Spatially Coupled LDPC Codes by Connecting Multiple Code Chains.*

Oct. 2014 **Technische Universität München (Germany)**, *Improving the Finite-Length Performance of Spatially Coupled LDPC Codes by Connecting Multiple Code Chains.*

Aug. 2011 **École polytechnique Fédérale de Lausanne (Switzerland)**, *Scaling behavior of Convolutional LDPC ensembles over BEC.*

Organizing Committees and Scientific activities

Sept. 2013 **IEEE Information Theory Workshop, Sevilla, Spain**, *Organizing Committee.*

Dec. 2014 **Spain Seminar on Signal Processing, Communication and Information Theory, Madrid**, *Co-chair.*

May 2017 **IEEE European School on Information Theory, Madrid**, *Co-chair.*

since June 2013 **Spanish chapter of the IEEE Information Theory Society**, *Secretary.*

Reviewing activities (journals & books), *IEEE Transactions on Information Theory, IEEE Transactions on Communications, IEEE Transactions on Signal Processing, IEEE Communication Letters.*

Selected Research Projects as Investigator

Jan. 2008–Dec. 2014 **Foundations and Methodologies for Future Communications and Sensor Networks**, *Spanish Research Ministry*, 121k EUR.

Jan. 2013–Dec. 2014 **Advances in Learning, Communications and Information Theory**, *Spanish Research Ministry*, 188k EUR.

Jan. 2013–Dec. 2017 **Machine Learning for Personalized Medicine (FP7-PEOPLE-2012-ITN-316861)**, *MARIE CURIE ACTIONS FP7*, 235k EUR.

Jan. 2013–Dec. 2017 **Distribuited Learning Communication and Information processing**, *Spanish Research Ministry*, 84k EUR.

Teaching Experience

since 2014 **Advanced Digital Communications**, Universidad Carlos III de Madrid, Graduate Level, (Taught in English).

since 2012 **Topics in Signal Processing for Digital Communications**, Universidad Carlos III de Madrid, Undergraduate Level.

2013-2015 **Principles of Signal Processing and Electric Circuit Analysis**, Universidad Carlos III de Madrid, Undergraduate Level,(Taught in English).

2012 **Principles of Digital Communications**, Universidad Carlos III de Madrid, Undergraduate Level.

2009-2011 **Digital Communications**, Universidad de Sevilla, Undergraduate Level.

Supervision

PhD. Students

since 2016 **Clara Hernandez**, *Approximate Inference for Discrete Optimization*, Universidad Carlos III de Madrid, Main advisor together with Matilde Sánchez-Fernández.. Expected finalization: September 2020.

since 2013 **Javier Céspedes**, *Machine Learning for Massive MIMO communications*, Universidad Carlos III de Madrid, Main advisor together with Matilde Sánchez-Fernández. Expected finalization: September 2016.

since 2014 **Yanfang Liu**, *Hardware-optimized decoders for LDPC codes*, Universidad Carlos III de Madrid, Main advisor together with Tobias Koch. Expected finalization: September 2018.

since 2013 **Javier Céspedes**, *Machine Learning for Massive MIMO communications*, Universidad Carlos III de Madrid, Main advisor together with Matilde Sánchez-Fernández. Expected finalization: September 2016.

Master' Theses

Sept. 2013 **Javier Céspedes**, *Expectation Propagation Decisor (EPD) Algorithm in High Order MIMO-QAM Systems*, Universidad Carlos III de Madrid. .

Undergraduate Projects

Sept. 2014 **Aránzazu Fernández**, *Advanced channel coding for optical communications*, Universidad Carlos III de Madrid.

Sept. 2014 **Paloma Jimeno**, *Symbol detection in massive MIMO systems: joint design with LDPC channel codes*, Universidad Carlos III de Madrid.

Oct. 2014 **Carlos Guzman**, *Analyzing finite-length LDPC codes*, Universidad Carlos III de Madrid.

Skills

- Languages: Spanish (native), English (fluent), French (moderate).
- Progamming: Python, C, Matlab.
- Online courses succesfully completed:
  - Machine Learning by Stanford University on Coursera. Certificate earned on November 18, 2015. Grade Achieved: 97.3%.
  - Machine Learning Foundations: A Case Study Approach by University of Washington on Coursera. Certificate earned on February 13, 2016. Grade Achieved: 99%.
  - Machine Learning: Regression by University of Washington on Coursera. Certificate earned on March 21, 2016. Grade Achieved: 98.4%.
  - Machine Learning: Classification by University of Washington on Coursera. Certificate earned on May 21. Grade Achieved: 99%.