Curriculum Vitae

Personal Information

Name:	Fernando Perez-Cruz
Birth place and date:	Seville, Spain, August 31, 1973
Citizenship:	Spain
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Academics

- Ph.D. in Telecommunication Engineering. Dissertation Title: Adaptive and Reduced Complexity Support Vector Machines. Technical University of Madrid, Dec 2000.
- B.Sc. & M.Sc. in Telecommunication Engineering (Electrical and Electronic Engineering in Signal Processing and Communications). University of Seville, Sep 1996.

Academic Employment

- Member of the Technical Staff at Bell Labs (Alcatel-Lucent). Jul 2014-
- Machine Learning Researcher at Amazon. Jun 2013-Jun 2014.
- Associate Professor. University Carlos III in Madrid. Oct 2006-Jun 2013.
- Visiting Professor and Marie Curie Fellow. Princeton University. Oct 2006 – Oct 2009.
- Postdoctoral Research Fellow. Gatsby Computational Neuroscience Unit, University College London. Oct 2003 – Dec 2005.
- Assistant Professor. University Carlos III in Madrid. Feb 2001 – Oct 2003.
- Teaching Assistant. University of Alcalá. Oct 1998 – Feb 2001.
- Graduate student. Polytechnical University of Madrid. Nov 1996 – Dec 2000.
- Visiting Researcher:
  1. New York State Psychiatric Institute (Columbia University). May 2012–Aug 2012.
  2. Biological Cybernetics, Max Planck Institute in Tübingen. Oct 2005.
  3. Biological Cybernetics, Max Planck Institute in Tübingen. Apr 2004.
  4. Biological Cybernetics, Max Planck Institute in Tübingen. Jun 2002 – Aug 2002.
  5. BIOWulf Technologies, New York office. Aug 2001 – Oct 2001.

Publications

Book

1. A. Artés-Rodríguez, F. Pérez-Gónzalez, J. Cid-Sueiro, R. López-Valcarce, C. Mosquera-Nartallo and F. Perez-Cruz, (2007). *Comunicaciones Digitales*. Prentice Hall. 2007.

Journals

1. F. J. R. Ruiz, I. Valera and F. Perez-Cruz, (2015). "Infinite Factorial Infinite Hidden Markov Model." *IEEE Transaction on Pattern Analysis and Machine Intelligence*, Accepted.

2. I. Valera, F. J. R. Ruiz, P. M. Olmos, C. Blanco and F. Perez-Cruz, (2015). "Infinite Continuous Feature Model for Psychiatric Comorbidity Analysis." *Neural Computation*, Accepted.

3. F. J. R. Ruiz, I. Valera, L. Svensson and F. Perez-Cruz, (2015). "Infinite Factorial Finite State Machine for Blind Multiuser Channel Estimation." *IEEE Transactions on Signal Processing*, Submitted.

4. P. G. Moreno, A. Artes-Rodriguez and F. Perez-Cruz (2015). "A Nonparametric Bayesian model for the Multiple Annotators problem." *IEEE Transaction on Neural Networks and learning systems*, Submitted.

5. M. F. Pradier, F. J. R. Ruiz, and F. Perez-Cruz, (2015). "Prior Design for Dependent Dirichlet Processes: An Application to Marathon Modeling". *PLOS ONE*, Submitted.

6. J. Cespedes, P. M. Olmos, M. Sánchez-Fernández, and F. Perez-Cruz, (2015). "Probabilistic Symbol Detection in Large Scale MIMO Systems with Expectation Propagation." *IEEE Transaction on Wireless Communications*, Submitted.

7. F. J. R. Ruiz, I. Valera and F. Perez-Cruz, (2015). "An Infinite Factorial Unbounded-State HMM for Blind Multiuser Channel Estimation." *Signal Processing Elsevier*, Submitted.

8. F. J. R. Ruiz and F. Perez-Cruz, (2015) "A generative model for predicting outcomes in college basketball." *Journal of Quantitative Analysis in Sports*. 11(1): 39 - 52. Mar.

9. L Salamanca, JJ Murillo-Fuentes, PM Olmos, F Perez-Cruz and S. Verdu, (2015). "Approaching the DT Bound Using Linear Codes in the Short Blocklength Regime." *IEEE Communications Letters*. 19(2): 123 - 126. Feb.

10. P. G. Moreno, Y. W. Teh, F. Perez-Cruz, A. Artes, (2015). "Bayesian Nonparametric Crowdsourcing." *Journal of Machine Learning Research*, 16(Aug):1607 - 1627, 2015.

11. J. Cespedes, P. M. Olmos, M. Sánchez-Fernández, and F. Perez-Cruz, (2014). "Expectation Propagation Detection for High-order High-dimensional MIMO Systems." *IEEE Transactions on Communications*, 62(8):2840 - 2849.

12. I. Valera, F. J. R. Ruiz, C. Blanco and F. Perez-Cruz, (2014). "Bayesian Nonparametric Comorbidity Analysis of Psychiatric Disorders". *Journal of Machine Learning Research*, 15(Apr):1215-1247.

13. C. G. Taborda, D. Guo and F. Perez-Cruz, (2014). "Information-Estimation Relationships over the Binomial and Negative Binomial Models". *IEEE Transactions on Information Theory*. 60(5):2630 - 2646. May.

14. R Santiago-Mozos, F Prez-Cruz, M Madden, A Artes-Rodriguez, (2014). "An Automated Screening System for Tuberculosis." *IEEE Journal of Biomedical and Health Informatics*, 18(3), 855-862. Mar.

15. L. Salamanca, P. M. Olmos, F. Perez-Cruz and J. J. Murillo-Fuentes, (2013). "Tree-Structured Expectation Propagation for LDPC Decoding over BMS Channels." *IEEE Transactions on Communications*. 61(10):4086-4095. October.

16. F. Perez-Cruz, S. Van Vaerenbergh, J. J. Murillo-Fuentes, M. Lazaro-Gredilla and I. Santamaria, (2013). "Gaussian Processes for Nonlinear Signal Processing". *IEEE Signal Processing Magazine*, 30(4):40-50. July.

17. P. M. Olmos, J. J. Murillo-Fuentes and F. Perez-Cruz, (2013). "Tree-Structure Expectation Propagation for LDPC Decoding over the BEC". *IEEE Transactions on Information Theory.* 59(6): 3354 - 3377, June.

18. L. Salamanca, P. M. Olmos, J. J. Murillo-Fuentes and F. Perez-Cruz, (2013). "Tree Expectation Propagation for ML Decoding of LDPC Codes over the BEC." *IEEE Transactions on Communications.* 61(2): 465 - 473, February.

19. M. A. Oquendo, E. Baca-Garcia, A. Artes, F. Perez-Cruz, H. C. Galfalvy, H. Blasco-Fontecilla, D. Madigan and N. Duan, (2012) "Machine learning and data mining: strategies for hypothesis generation." *Molecular Psychiatry.* 17(10):956 - 959. October.

20. L. Salamanca, J. J. Murillo-Fuentes and F. Perez-Cruz, (2012). "Bayesian Equalization for LDPC Channel Decoding." *IEEE Transactions on Signal Processing.* 60(5): 2672 - 2676, May.

21. P. M. Olmos, L. Salamanca, J. J. Murillo-Fuentes and F. Perez-Cruz, (2012). "On the Design of LDPC-Convolutional Ensembles Using the TEP Decoder." *IEEE Communications Letters.* 16(5): 726 - 729. May.

22. P. M. Olmos, J. J. Murillo-Fuentes and F. Perez-Cruz, (2011). "Tree-Structured Expectation Propagation for decoding finite-length LDPC codes." *IEEE Communications Letters*, 15(2):235-237. January.

23. R. Santiago-Mozos, F. Perez-Cruz and A. Artés-Rodríguez, (2011). "Extended Input Space Support Vector Machine." *IEEE Transaction on Neural Networks*, 22(1):158-163, January.

24. D. Tuia, J. Verrelst, L. Alonso, F. Perez-Cruz and G. Camps-Valls (2011). "Multioutput Support Vector Regression for Remote Sensing Biophysical Parameter Estimation." *Geoscience and Remote Sensing Letters*, 8(4):804-808. July.

25. M. Fresia, F. Perez-Cruz, H. V. Poor and S. Verdú (2010). "Joint Source/Channel Coding with Low Density Parity Check Matrices." *IEEE Signal Processing Magazine*, 27(6):104-113, November.

26. F. Perez-Cruz and S. Kulkarni (2010). "Robust and Low Complexity Distributed Kernel Least Squares Learning in Sensor Networks." *IEEE Signal Processing Letters*, 17(4):355-358. April.

27. F. Perez-Cruz, M. Rodrigues and S. Verdú, (2010). "Optimal Linear Precoding for Multiple-Input Multiple-Output Gaussian Channels with Arbitrary Inputs." *IEEE Transactions on Information Theory*, 56(3):1070-1084. March.

28. P. M. Olmos, J. J. Murillo-Fuentes and F. Perez-Cruz, (2010). "Joint Nonlinear Channel Equalization and Soft LDPC Decoding with Gaussian Processes." *IEEE Transactions on Signal Processing*, 58(3-1):1183-1192. March.

29. J. J. Murillo-Fuentes and F. Perez-Cruz, (2009). "Gaussian Process Regressors for Multiuser Detection in DS-CDMA Systems." *IEEE Transactions on Communications*, 57(8):2339-2347, August.

30. F. Perez-Cruz, J. J. Murillo-Fuentes and S. Caro, (2008). "Nonlinear Channel Equalization with Gaussian Processes for Regression." *IEEE Transactions on Signal Processing*, 56(10-2):5283–5286, October.

31. F. Perez-Cruz and J. J. Murillo-Fuentes, (2008). "Digital Communication Receivers Using Gaussian Processes for Machine Learning." *EURASIP Journal on Advances in Signal Processing*, 2008:1–12, May.

32. G. Camps, E. Soria, J. Pérez, F. Perez-Cruz, A. Artés-Rodríguez and N. V. Jiménez-Torres, (2007). "Therapeutic Drug Monitoring of Kidney Transplant Recipients Using Profiled Support Vector Machines." *IEEE Transactions on Systems, Man and Cybernetics, Part C*, 37(3):359–372, May.

33. M. Lázaro, I. Santamaría, F. Perez-Cruz and A. Artés-Rodríguez, (2005). "Support Vector Regression for the Simultaneous Learning of a Multivariate Function and its Derivatives." *Neurocomputing*, 69(3):42–61, December.

34. M. Lázaro, F. Perez-Cruz and A. Artés-Rodríguez, (2005). "Learning a Function and its Derivative Forcing the Support Vector Expansion." *IEEE Signal Processing Letters*, 12(3):194–197, March.

35. F. Perez-Cruz, C. Bousoño-Calzón and A. Artés-Rodríguez, (2005). "Convergence of the IRWLS Procedure to the Support Vector Machine Solution." *Neural Computation*, 17(1):7–18, January.

36. S. Salcedo-Sanz, M. de-Prado-Cumplido, M. J. Segovia-Vargas, F. Perez-Cruz and C. Bousoño-Calzón, (2004). "Feature Selection Methods Involving Support Vector Machines for Prediction of Insolvency in Non-Life Insurance Companies." *Intelligent Systems in Accounting, Finance and Management*, 12(4):261–281, December.

37. S. Salcedo-Sanz, F. Perez-Cruz, G. Camps and C. Bousoño-Calzón, (2004). "Enhancing Genetic Feature Selection Through Restricted Search and Walsh Analysis." *IEEE Transactions on Systems, Man and Cybernetics, Part C*, 34(4):398–406, November.

38. M. P. Sánchez-Fernández, M. de-Prado-Cumplido, J. Arenas-García and F. Perez-Cruz, (2004). "SVM Multiregression for Nonlinear Channel Estimation in Multiple-Input Multiple-Output Systems." *IEEE Transactions on Signal Processing*, 58(8):2298–2307, August.

39. A. Navia-Vázquez, F. Perez-Cruz, A. Artés-Rodríguez and A. R. Figueiras-Vidal, (2004). "Advantages of Unbiased Support Vector Classifiers for Data Mining Applications." *Journal of VLSI Signal Processing Systems*, 37(2):223–235, June.

40. F. Perez-Cruz and O. Bousquet, (2004). "Kernel Methods and Their Potential Use in Signal Processing." *IEEE Signal Processing Magazine*, 21(3):57–65, May.

41. F. Perez-Cruz, J. A. Afonso-Rodríguez, and J. Giner, (2003). "Estimating GARCH Models Using the Support Vector Machine." *Quantitative Finance*, 3(3):163–172, June.

42. J. Weston, F. Perez-Cruz, O. Bousquet, O. Chapelle, A. Elisseeff and B. Schölkopf, (2003). "Feature Selection and Transduction for Prediction of Molecular Bioactivity for Drug Design." *Bioinformatics*, 19(6):764–771, April.

43. F. Perez-Cruz, A. Navia-Vázquez, A. R. Figueiras-Vidal, and A. Artés-Rodríguez, (2003). "Empirical Risk Minimization for Support Vector Classifiers." *IEEE Transactions on Neural Networks*, 14(2):296–303, March.

44. G. Camps, E. Soria, J. Pérez, F. Perez-Cruz, A. R. Figueiras-Vidal and A. Artés-Rodríguez, (2002). "Improving Concentration Prediction Using Clustering and Support Vector Regression Methods." *IEE Electronic Letters*, 38(12):568–570, June.

45. A. Navia-Vázquez, F. Perez-Cruz, A. Artés-Rodríguez and A. R. Figueiras-Vidal, (2001). "Weighted Least Squares Training of Support Vectors Classifiers Which Leads to Compact and Adaptive Schemes." *IEEE Transactions on Neural Networks*, 12(5):1047–1059, September.

46. F. Perez-Cruz, A. Navia-Vázquez, P. Alarcón-Diana and A. Artés-Rodríguez, (2001). "SVC-Based Equalizer for Burst TDMA Transmissions." *Signal Processing*, 81(8):1681–1693, August.

47. F. J. González-Serrano, F. Perez-Cruz and A. Artés-Rodríguez, (1998). "Reduced-Complexity Equaliser for Nonlinear Channels." *IEE Electronic Letters*. 34(9):856–858, April.

Book Chapters

1. P. M. Olmos, J. J. Murillo-Fuentes and F. Perez-Cruz, (2009). "Gaussian Processes and its Application to the design of Digital Communication Receivers." *Machine Learning*, by ,V. Kodric (editor), In-Tech.

2. F. Perez-Cruz, Z. Ghahramani and M. Pontil, (2007). "Conditional Graphical Models." In *Predicting Structured Data* by G. H. BakIr, T. Hofmann, B. Schölkopf, A. J. Smola, B. Taskar and S. V. N. Vishwanathan (editors). MIT Press.

3. F. Perez-Cruz, J. Weston, D. J. L. Herrmann and B. Schölkopf, (2003). "Extension of the ν-SVM Range for Classification." In *Advances in Learning Theory: Methods, Models and Applications* by J. A. K. Suykens, G. Horvath, S. Basu, C. Micchelli and J. Vandewalle (editors). IOS Press.

Granted Patents

- Methods for feature selection in a learning machine. J. A. E. Weston, A. Elisseeff, B. Schoelkopf and **F. Perez-Cruz**. Health Discovery Corporation. US Patent 7,624,074.

- Pre-processed feature ranking for a support vector machine. J. A. E. Weston, A. Elisseeff, B. Schoelkopf, **F. Perez-Cruz** and I. Guyon. Health Discovery Corporation. US Patent 7,475,048.

- Method for feature selection in a support vector machine using feature ranking. J. A. E. Weston, A. Elisseeff, B. Schoelkopf, **F. Perez-Cruz** and I. Guyon. Health Discovery Corporation. US Patent 7,805,388.

- Method for feature selection and for evaluating features identified as significant for classifying data. I. Guyon, A. Elisseeff, J. A. E. Weston, B. Schoelkopf and **F. Perez-Cruz**. Health Discovery Corporation. US Patent 7,970,718.

Conferences and Workshops

Invited Talks

- I. Valera, F. J. R. Ruiz, L. Svensson and F. Perez-Cruz, (2015). "A Bayesian Nonparametric Approach for Blind Multiuser Channel Estimation." *European Signal Processing Conference*, Nice (France), September.

- F. Perez-Cruz and H Huang, (2015). "A Blind Nonparametric Non-line of Sight Bias Model for Accurate Localization". *Information Theory and Applications*, San Diego (USA), February.

- F. J. R. Ruiz, I. Valera and F. Perez-Cruz, (2013). "A Bayesian Nonparametric Receiver for Joint Channel Estimation and Symbol Detection for Multiple Users". *Information Theory and Applications*, San Diego (USA), February.

- F. Perez-Cruz, (2012). "New Tools to generate predictive models for attempts suicide" *XVI National Conference on Psychiatry*, Bilbao (Spain). September.

- F. Perez-Cruz, (2012). Coding and Approximate Inference. Machine Learning Summer School (MLSS). La Palma (Spain). April.

- L. Salamanca, P. M. Olmos, J. J. Murillo-Fuentes and F. Perez-Cruz, (2012). "Tree-Structure Expectation Propagation for LDPC decoding in AWGN Channels". *Information Theory and Applications*, San Diego (USA), February.

- F. J. R. Ruiz and F. Perez-Cruz, (2011). "Zero-error codes for the noisy-typewriter channel." *Summer Research Institute*, Lausanne (Switzerland), June.

- F. Perez-Cruz, (2010). "Supervised Machine Learning: Its application to NESARC" *13th European Symposium on Suicide and Suicidal Behaviour*, Rome (Italy). September.

- P. M. Olmos, J. J. Murillo-Fuentes and F. Perez-Cruz, (2010). "Analyzing the Maxwell Decoder for LDPC Codes in Binary Erasure Channels." *Information Theory and Applications*, San Diego (USA), February.

- M. Fresia, F. Perez-Cruz, H. V. Poor and S. Verdú (2009). "Joint Source-Channel Coding with Concatenated LDPC Codes." *Information Theory and Applications*, San Diego (USA), February.

- F. Perez-Cruz, M. Rodrigues and S. Verdú, (2009). "Optimal Precoding for Multiple-Input Multiple-Output Gaussian Channels." Seminar PIIRS, Princeton (USA), April.

- F. Perez-Cruz, (2006). "Supervised Classification." AERFAI Summer School on Action and Object Classification Techniques in Digital Images, Granada (Spain), June

- F. Perez-Cruz, (2005). "Support Vector Machines." Tutorial at the Spanish Organization of Pattern Recognition and its Applications, Córdoba (Spain), January.

- F. Perez-Cruz, Z. Ghahramani and M. Pontil, (2004). "Kernel Conditional Graphical Models." Workshop on Graphical Models and Kernels, *Advances in Neural Information Processing Systems*, Whistler (Canada), December.

- F. Perez-Cruz and A. Artés-Rodríguez, (2004). "Speeding up the IRWLS Convergence to the SVM Solution." Special Session on Least Squares Support Vector Machines, *International Joint Conference in Neural Networks*, Budapest (Hungary), July.

- J. M. García-Cabellos, C. Peláez-Moreno, A. Gallardo-Antolín, F. Perez-Cruz and F. Díaz-de-María, (2004). "SVM Classifiers for ASR: a Discussion About Parameterization." Special Session on Nonlinear Speech Processing, *European Signal Processing Conference*, Vienna (Austria), September.

- O. Bousquet and F. Perez-Cruz, (2003). "Kernel Methods and Their Applications to Signal Processing." Special Session on Support Vector Machines and Kernels Techniques in Signal Processing, *International Conference in Acoustic Speech and Signal Processing*, Hong Kong (China), April.

- F. Perez-Cruz and A. Artés-Rodríguez, (2002). "Adaptive SVC for Nonlinear Channel Equalization." Special Session on Nonlinear Techniques for Channel Equalization, *European Signal Processing Conference*, Toulouse (France), September.

- F. Perez-Cruz , (2002). "ASVC for Communications ." *Learning'02*, Madrid (Spain), October.

2015

- I. Valera, F. J. R. Ruiz, L. Svensson and F. Perez-Cruz, (2015). "Infinite Factorial Dynamical Model" *Advances in Neural Information Processing 29*, Montreal (Canada), December.

- U. G. Acer, A. Boran, C. Forlivesi, W. Liekens, F. Perez-Cruz and F. Kawsar, (2015). "Sensing WiFi Network for Personal Object Analytics," *International Conference on Internet of Things*, Seoul (Korea). October.

- M. Dashi, S. Yiu, Siamak Yousefi, F. Perez-Cruz and H. Claussen, (2015) "RSSI Localization with Gaussian Processes and Tracking," *IEEE Globecom.* San Diego (CA), December

2014

- I. Valera, F. J. R. Ruiz and F. Perez-Cruz, (2014). "Infinite Factorial Unbounded Hidden Markov Model For Blind Multiuser Channel Estimation".*4th International Workshop on Cognitive Information Processing*, Copenhagen (Denmark), May.

- C. G. Taborda, D. Guo and F. Perez-Cruz, (2014). "New Information-Estimation Results for the Poisson and Binomial Models". *IEEE International Symposium on Information Theory* , Honolulu (USA), July.

- J. Cespedes, P. M. Olmos, M. Sanchez-Fernandez and F. Perez-Cruz, (2014). "Improved performance of LDPC-coded MIMO systems with EP-based soft-decisions". *IEEE International Symposium on Information Theory* , Honolulu (HI), July.

2013

- F. J. R. Ruiz, I. Valera, C. Blanco and F. Perez-Cruz, (2013). "Bayesian Nonparametric Comorbidity Analysis of Psychiatric Disorders". *9th Conference on Bayesian Nonparametric*, Amsterdam (The Netherlands), June.

- L. Salamanca, P. M. Olmos, J. J. Murillo-Fuentes and F. Perez-Cruz, (2013). "Improving the BP estimate over the AWGN channel using Tree-structured expectation propagation". *IEEE International Symposium on Information Theory* , Istanbul (Turkey), July

2012

- F. J. R. Ruiz, I. Valera, C. Blanco and F. Perez-Cruz, (2012). "Bayesian Nonparametric Modeling of Suicide Attempts".*Advances in Neural Information Processing 26*, Lake Tahoe (USA), December.

- P. M. Olmos, L. Salamanca, J. J. Murillo-fuentes and F. Perez-Cruz, (2012). "Finite-length performance of spatially-coupled LDPC codes under TEP decoding". *IEEE Information Theory Workshop*, Lausanne (Switzerland), September.

- C. G. Taborda and F. Perez-Cruz, (2012). "Derivative of the Relative Entropy over the Poisson and Binomial channel". *IEEE Information Theory Workshop*, Lausanne (Switzerland), September.

- P. M. Olmos, L. Salamanca, J. J. Murillo-Fuentes and F. Perez-Cruz, (2012). "Finite-length analysis of the TEP decoder for LDPC ensembles over the BEC". *IEEE International Symposium on Information Theory* , Cambridge (MA), July

- C. G. Taborda and F. Perez-Cruz, (2012). "Mutual Information and Relative Entropy over the Binomial and Negative Binomial Channels". *IEEE International Symposium on Information Theory*, Cambridge (MA), July.

- N. O'Mahony and F. Perez-Cruz, (2012). "A Novel Sequential Bayesian Approach to GPS Acquisition". *3rd Workshop on Cognitive Information Processing (CIP)*, Vigo (Spain). May.

2011

- S. Goparaju, R. Calderbank, W. Carson, M. Rodrigues, and F. Perez-Cruz, (2011), When to Add Another Dimension when Communicating over MIMO Channels. ICASSP, Praha (Check Republic), May.
- P. M. Olmos, J. J. Murillo-Fuentes and F. Perez-Cruz, (2011). "Capacity Achieving LDPC Ensembles for the TEP Decoder in Erasure Channels." *IEEE International Symposium on Information Theory*, St. Petersburg (Russian Fed), August.
- L. Salamanca, P. M. Olmos, J. J. Murillo-Fuentes and F. Perez-Cruz, (2011). "MAP decoding for LDPC codes over the Binary Erasure Channel." *IEEE Information Theory Workshop*, Paraty (Brazil), October.
- F. J. R. Ruiz and F. Perez-Cruz, (2011). "Zero-error codes for the noisy-typewriter channel." *IEEE Information Theory Workshop*, Paraty (Brazil), October.
- P. M. Olmos, L. Salamanca, J. J. Murillo-Fuentes and F. Perez-Cruz, (2011). "An Application of Tree-Structured Expectation Propagation for Channel Decoding". *Advances in Neural Information Processing 25*, Granada (Spain), December.

2010

- L. Salamanca, J. J. Murillo-Fuentes and F. Perez-Cruz, (2010). "Bayesian BCJR for Channel Equalization and Decoding." *IEEE Machine Learning for Signal Processing (MLSP)*. Kittila (Finland), August.
- P. M. Olmos, J. J. Murillo-Fuentes and F. Perez-Cruz, (2010). "Tree-structure Expectation Propagation for Decoding LDPC codes over Binary Erasure Channels." *IEEE International Symposium on Information Theory*, Austin (TX), June.
- L. Salamanca, J. J. Murillo-Fuentes and F. Perez-Cruz, (2010). "Channel Decoding with a Bayesian Equalizer." *IEEE International Symposium on Information Theory*, Austin (TX), June.

2009

- P. M. Olmos, J. J. Murillo-Fuentes and F. Perez-Cruz, (2009). "Soft LDPC decoding in nonlinear channels with Gaussian processes for classification." *European Signal Processing Conference*, Glasgow (Scotland), August.
- F. Perez-Cruz and S. Kulkarni (2009). "Distributed Least Square for Consensus Building in Sensor Networks." *IEEE International Symposium on Information Theory*, Seoul (Korea), June.
- M. Fresia, F. Perez-Cruz and H. V. Poor (2009). "Optimized Concatenated LDPC Codes for Joint Source-Channel Coding." *IEEE International Symposium on Information Theory*, Seoul (Korea), June.

2008

- F. Perez-Cruz (2008). "Estimation of Information Theoretic Measures for Continuous Random Variables." *Advances in Neural Information Processing 21*, Vancouver (Canada), December.
- F. Perez-Cruz (2008). "Kullback-Leibler Divergence Estimation of Continuous Distributions." *IEEE International Symposium on Information Theory*, Toronto (Canada), July.
- F. Perez-Cruz, M. Rodrigues and S. Verdú, (2008). "Optimal Precoding for Digital Subscriber Lines." *International Conference on Communication 2008*, Beijing (China), May.

- R. Santiago-Mozos, R. Fernández-Lorenzana, F. Perez-Cruz and A. Artés-Rodríguez, (2008). "On the Uncertainty in Sequential Hypothesis Testing." *5th IEEE International Symposium on Biomedical Imaging*, Paris (France), May.

- M. Rodrigues, F. Perez-Cruz and S. Verdú, (2008). "Optimal Input Covariance for Multiple-Input Multiple-Output Gaussian Channels with Arbitrary Inputs." *Information Theory Workshops 2008*, Porto (Portugal), May.

2007

- F. Perez-Cruz, M. Rodrigues and S. Verdú, (2007). "Generalized Mercury/Waterfilling for Multiple-Input Multiple-Output Channels." *45th Annual Allerton Conference on Communication, Control, and Computing*, Allerton (Illinois, USA), September.

- F. Perez-Cruz, P. M. Olmos and J. J. Murillo-Fuentes, (2007). "Accurate Posterior Probability Estimates for Channel Equalization Using Gaussian Processes for Classification." *VIII IEEE Workshop on Signal Processing Advances in Wireless Communications*, Helsinki (Finland), June.

2006

- R. Solera-Ureña, F. Perez-Cruz and F. Díaz de María, (2006). "Estimación de Probabilidades a Posteriori en SVMs Multiclase para Reconocimiento de Habla Continua." *IV Jornadas de Tecnología del Habla*, Zaragoza (Spain), November.

- S. Caro, F. Perez-Cruz and J. J. Murillo-Fuentes, (2006). "Gaussian Processes for Regression in Channel Equalization." *European Signal Processing Conference*, Firenze (Italy), September.

- F. Perez-Cruz and J. J. Murillo-Fuentes, (2006). "Gaussian Processes for Digital Communications." *International Conference in Acoustic Speech and Signal Processing*, Toulouse (France), May.

2005

- J. J. Murillo-Fuentes, S. Caro and F. Perez-Cruz, (2005). "Gaussian Processes for Multiuser Detection." *Advances in Neural Information Processing Systems 18*. Vancouver (Canada), December.

- F. Perez-Cruz, S. Zourlidou and Z. Ghahramani, (2005). "Dirichlet Prior for Bayesian GARCH." *Workshop on Machine Learning in Finance at NIPS'05*, Whistler (Canada), December.

2004

- F. Perez-Cruz, M. Lázaro and A. Artés-Rodríguez, (2004). "Multidimensional SVM to Include the Samples of the Derivative in the Reconstruction of a Function." *European Signal Processing Conference*, Vienna (Austria), September.

- F. Perez-Cruz, A. R. Figueiras-Vidal and A. Artés-Rodríguez, (2004). "Double Chunking for Solving SVMs for Very Large Datasets." *Learning'04*, Elche (Spain), October.

2003

- J. Arenas-García and F. Perez-Cruz, (2003). "Multi-class Support Vector Machines a New Approach." *International Conference in Acoustic Speech and Signal Processing*, Hong Kong (China), April.

- R. Santiago-Mozos, J. M. Leiva-Murillo, F. Perez-Cruz and A. Artés-Rodríguez, (2003). "Supervised-PCA and SVM Classifiers for Object Detection in Infrared Images." *IEEE International Conference on Advanced Video and Signal Based Surveillance*, Miami (USA), July.

- M. Lázaro, I. Santamaría, F. Perez-Cruz and A. Artés-Rodríguez, (2003). "Support Vector Machine for the Simultaneous Approximation of a Function and its Derivatives." *IEEE Neural Network for Signal Processing*, Toulouse (France), September.

2002

- J. M. Leiva-Murillo, R. Santiago-Mozos, F. Perez-Cruz and A. Artés-Rodríguez, (2002). "Comparison of Supervised Feature Extraction Methods for Multispectral Images." *Learning'02*, Madrid (Spain), October.

- F. Perez-Cruz, J. A. Afonso-Rodríguez, and J. Giner, (2002). "Estimating GARCH Models Using the Support Vector Machine." *Learning'02*, Madrid (Spain), October.

- R. Gil-Pita, M. Rosa-Zurera and F. Perez-Cruz, (2002). "Improving Lossy Image Compression Wavelet Transform Algorithms by Predicting Discarded Coefficients." *European Signal Processing Conference*, Toulouse (France), September.

- F. Perez-Cruz and A. Artés-Rodríguez, (2002). "Puncturing Multi-class Support Vector Machines." *International Conference on Artificial Neural Networks*, Madrid (Spain), August.

- F. Perez-Cruz, G. Camps, E. Soria, J. Pérez, A. R. Figueiras-Vidal and A. Artés-Rodríguez, (2002). "Multi-dimensional Function Approximation and Regression Estimation." *International Conference on Artificial Neural Networks*, Madrid (Spain), August.

- S. Salcedo-Sanz, M. de-Prado-Cumplido, F. Perez-Cruz and C. Bousoño-Calzón, (2002). "Feature Selection via Genetic Optimization." *International Conference on Artificial Neural Networks*, Madrid (Spain), August.

2001

- F. Perez-Cruz and J. Giner, (2001). "The Support Vector Machine and its Application in Finance." *Applications of Physics in Financial Analysis*, London (UK), December.

- G. Camps, E. Soria, J. Pérez, F. Perez-Cruz, A. R. Figueiras-Vidal and A. Artés-Rodríguez, (2001). "A Profile-Dependant Kernel-Based Regression for Cyclosporine Concentration Prediction." *Workshop in Kernel-Based Learning at NIPS'01*, Whistler (Canada), December.

- A. Navia-Vázquez, F. Perez-Cruz, A. Artés-Rodríguez and A. R. Figueiras-Vidal, (2001). "Unbiased Support Vector Classifier." *IEEE Neural Network for Signal Processing*, Boston (USA), September.

- F. Perez-Cruz and A. Artés-Rodríguez, (2001). "An IRWLS Procedure for ν-SVR." *International Conference in Acoustic Speech and Signal Processing*, Salt Lake City (USA), May.

2000

- F. Perez-Cruz, P. Alarcón-Diana, A. Navia-Vázquez and A. Artés-Rodríguez, (2000). "Fast Training of Support Vector Classifiers." *Advances in Neural Information Processing Systems 13*, Denver (USA), November.

- F. Perez-Cruz and A. Artés Rodríguez, (2000). "Iterative Re-Weighted Least Square Procedure for SVM." *Workshop in New Perspectives in Kernel-Based Learning Methods at NIPS'00*, Breckenridge (USA), November.

- F. Perez-Cruz and A. Artés-Rodríguez, (2000). "Adaptive Support International Vector Machine." *Workshop in New Perspectives in Kernel-Based Learning Methods at NIPS'00*, Breckenridge (USA), November.

- F. Perez-Cruz, A. Navia-Vázquez, P. Alarcón-Diana and A. Artés-Rodríguez, (2000). "An IRWLS Procedure for SVR." *European Signal Processing Conference*, Tampere (Finland), September.

- F. Perez-Cruz, P. Alarcón-Diana and A. Artés-Rodríguez, (2000). "Recurrent Support Vector Classifier for Channel Equalization." *Learning'00*. Madrid (Spain), September.

- F. Perez-Cruz, A. Navia-Vázquez, P. Alarcón-Diana and A. Artés-Rodríguez, (2000). "Support Vector Classifier with Hyperbolic Tangent Penalty Function." *International Conference in Acoustic Speech and Signal Processing*. Istanbul (Turkey), June.

1999

- F. Perez-Cruz, A. Navia-Vázquez, J. L. Rojo-Álvarez and A. Artés-Rodríguez, (1999). "A New Training Algorithm for Support Vector Machines." *Fifth Bayona Workshop on Emerging Technologies in Telecommunications*, Baiona (Spain), September.

1998

- J. L. Rojo-Álvarez, F. Perez-Cruz, S. Haykin and A. Artés-Rodríguez, (1998). "Probability Density Estimation with Support Vector Method." *Learning'98*, Madrid (Spain), June.

- F. J. González-Serrano, F. Perez-Cruz and A. Artés-Rodríguez, (1998). "Reduced-Complexity Decision-Feedback Equalizers for Nonlinear Channels." *European Signal Processing Conference*. Rhodes (Greece), April.

Funded Research Projects

Research Projects as Principal Investigator

1. Advances in Learning, Communications and Information Theory. **Spanish Research Ministry**. Feb 2013 – Jan 2016.

2. Initial Training Network: Machine Learning for Personalized Medicine. **European Union**. Jan 2013 – Dec 2016.

3. Analysis, Design and Optimization of Next Generation Wireless Communications Systems. **Spanish Research Ministry**. Jan 2010 – Dec 2012.

4. Estimation, Transmission and Optimization of Wireless Sensors Networks. **Madrid regional Government**. Jan 2010 – Dec 2010.

5. Marie Curie Outgoing Fellowship: Approximate Inference for Communications. **European Union**. Oct 2006 – Oct 2009.

6. Kernel Methods Extensions for Digital Communications. **MECD/Fulbright Fellowship (Spanish Education Ministry)**. Oct 2003 – Oct 2005.

7. New Tools Based on Support Vector Machines for MIMO Channel Estimation and Financial Time Series Prediction. **Madrid regional Government**. Oct 2003 – Sep 2004.

Selected Research Projects as Investigator

1. PASCAL NoE of the 7^{th} European Union. Mar 2008– Feb 2013.

2. Foundations and Methodologies for Future Communications and Sensor Networks. Spanish Research Ministry. Jan 2008 – Dec 2014.

3. Distributed Learning Communication and Information Processing. Spanish Research Ministry. Dec 2009 – Jun 2013.

4. Intelligent Monitoring. Spanish Research Ministry. Dec 2006 – Dec 2009.

5. Distributed Multimedia Processing. Madrid regional Government. Oct 2006 – Oct 2009.

6. Object Recognition in Infrared Images for Surveillance Applications. Spanish Research Ministry. Dec 2003 – Dec 2006.

7. Signal Processing for an Infrared Image Detection System. Spanish Research Ministry. Dec 2000 – Dec 2003.

8. EUREKA EU-1361 "ON-AIR". Oct 1995 – Sep 2000.

Industry Funding

1. Implementation of the Preprocessing Module in SIRIO. Spanish Navy (Ministry of Defense). Jun 2001 – Apr 2003.

2. Algorithmic Analysis of an IRST System. Tecnobit. Mar 2001 – May 2001.

3. MPEG-4 Encoder. Prodys. Jan 2001 – Dec 2003.

4. Cooperation in EU EUREKA Project "ON-AIR." Telefónica R&D. Feb 1996 – Mar 2000.

5. Implementing an H.263 Video Encoder. Teldat. Oct 1997 – Dec 1997.

Teaching Experience

Princeton University

1. Supervised learning. *ELE530 Theory of Detection and Estimation.* Spring 2009.

University College London

1. Supervised learning. *M.Sc. Intelligent Systems.* 2004-2005.

University Carlos III in Madrid

1. Digital communications. *Ph.D. Course*. 2010-2011, 2011-12 & 2012-13.
2. Signal processing for digital communications. *Ph.D. Course*. 2005-2006.
3. Advances in design and applications in neural networks. *Ph.D. Course*. 2001-2002 & 2002-2003.
4. Multimedia processing *Ph.D. Course*. 2000-2001, 2001-2002 & 2002-2003.
5. Digital communications. *Undergraduate*. 2001-2002 & 2005-2006.
6. Signal processing and communications laboratory *Undergraduate*. 2000-2001, 2001-2002, 2002-2003 &2005-2006.
7. Communication systems and channels. *Undergraduate*. 2001-2002 & 2002-2003.
8. Communication theory. *Undergraduate*. 2002-2003, 2009-2010, 2010-2011, 2011-2012 & 2012-13.
9. Linear System. *Undergraduate*. 2012-13.
10. Signals and System for Biomedical Engineering. *Undergraduate*. 2012-13.
11. Information Processing. *Undergraduate*. 2009-2010.
12. Telecommunications systems. *Undergraduate*. 2000-2001.

University of Alcalá

1. Data transmission. *Undergraduate*. 1998-1999 & 1999-2000.
2. Electrical circuits laboratory. *Undergraduate*. 1998-1999, 1999-2000 & 2000-2001.
3. Signals and systems laboratory. *Undergraduate*. 1998-1999, 1999-2000 & 2000-2001.

Former Postdocs

1. William Carson. University of Porto.
2. Niamh O'Mahony. University Carlos III in Madrid.
3. Jesse Reed. University Carlos III in Madrid.

Current Ph.D. Students

1. Melanie F. Pradier. University Carlos III in Madrid.

Former Ph.D. Students

1. Ricardo Santiago-Mozos. University Carlos III in Madrid. Graduated in 2010. (Not doing Research).
2. Pablo M. Olmos. University of Seville (Now an Assistant professor at University Carlos III in Madrid).
3. Luis Salamanca. University of Seville (Now a Postdoc at University of Luxembourg).
4. Camilo Gil. University Carlos III in Madrid (Now an Assistant Professor at Universidad de Medellin).

5. Isabel Valera. University Carlos III in Madrid (Now a postdoc at the Max Plank for Software Systems).

6. Francisco J. R. Ruiz. University Carlos III in Madrid (Now a postdoc at Columbia University).

7. Pablo G. Moreno. University Carlos III in Madrid (Now a postdoc at Amazon/University of Toronto).

Former M.Sc. and B.Sc. Students

1. J. Alfonso Calvo Montes *M.Sc. Thesis*: Machine learning for estimating probabilities in Sports: Basket. University Carlos III, 2012.

2. Miriam Trujillo *B.Sc. Thesis*: Machine learning for estimating probabilities in Sports: Horse Racing. University Carlos III, 2012.

3. Alberto Cela *B.Sc. Thesis*: Machine learning for estimating probabilities in Sports: Soccer. University Carlos III, 2012.

4. Julio C. Moya *B.Sc. Thesis*: Visual guided system. University Carlos III, 2012.

5. Javier Céspedes *B.Sc. Thesis*: Machine learning for estimating probabilities in Sports: Tennis. University Carlos III, 2011.

6. Raquel Martín *B.Sc. Thesis*: Machine learning for estimating probabilities in Sports: Soccer. University Carlos III, 2011.

7. Jennifer Howard. *B.Sc. Thesis*: Distributed Regression in Sensor Networks with Reduced Message Passing. Princeton University, 2008.

8. Ramón Fernández Lorenzana. *M.Sc. Thesis*: Multi classification with kernels. University Carlos III, 2007.

9. Stefania Zourlidou. *M.Sc. Thesis*: Bayesian machine learning for volatility prediction in financial time series. University College London, 2005.

10. Patricia López-Ortega Sanz. *M.Sc. Thesis*: Handwritten text recognition using support vector machines. University Carlos III, 2003.

11. Verónica Verdugo Alonso. *B.Sc. Thesis*: Independent spatial and temporal component analysis of fMRI data. University Carlos III, 2003.

12. Raúl Sánchez Vítores. *B.Sc. Thesis*: Face detection using support vector machines. University Carlos III, 2003.

13. Ramón Fernández Lorenzana. *B.Sc. Thesis*: Speech recognition using support vector machines. University Carlos III, 2003.

14. Roberto Gil Pita. *M.Sc. Thesis*: Image Compression with wavelets. Alcalá University, 2001.

15. Sergio Bravo Gordillo. *M.Sc. Thesis*: Low bit-rate video coding using discrete wavelet transform. Technical University of Madrid, 2000.

16. Sergio Arribas Gómez. *M.Sc. Thesis*: Low bit-rate video coding using discrete wavelet transform. Technical University of Madrid, 2000.

17. José Luis Salcedo Gamarra. *M.Sc. Thesis*: H.263 video coding standard with background prediction tools. Technical University of Madrid, 1999.

18. Roberto Jiménez de Mingo. *M.Sc. Thesis*: Video capturing and storing system. Technical University of Madrid, 1998.

Other Merits

- Vice-President of the IEEE Information Theory Society (Spanish Chapter). Best Chapter Award in 2011.
- Member of PASCAL Network of Excellence of the Sixth European Union Research Programme.
- Member of PASCAL2 Network of Excellence of the Seventh European Union Research Programme.
- IEEE Senior Member since Jan 2006 (Student 1997 and Member 2001).
- Administrative Board of the Marie Curie Fellowship Association 2010 (National Groups Coordinator).
- Organizing Committees:
  1. General Chair. AI and Statistics, Cadiz (Spain), May 2016.
  2. General Chair. Machine Learning Summer School, Arequipa (Peru), August 2016.
  3. Area Chair. IEEE Information Theory Workshop (ITW), Cambridge (U.K.), September 2016.
  4. General Chair. IEEE Information Theory Workshop (ITW), Sevilla (Spain), September 2013.
  5. Program Chair. IEEE Machine Learning for Signal Processing (MLSP), Santander (Spain), September 2012.
  6. Local Arrangements Chair. AI and Statistics, La Palma (Spain), April 2012.
  7. Advances in Neural Information Processes (NIPS) 2011. Workshop Chair.
  8. Assistive Machine Learning for People with Disabilities Symposia, at Advances in Neural Information Processes (NIPS), Vancouver (Canada), Dec. 10, 2009.
  9. Advances in Neural Information Processes (NIPS) 2007. Volunteer Chair.
  10. Advances in Neural Information Processes (NIPS) 2006. Volunteer Chair.
  11. Learning'02 Workshop. Madrid (Spain), Oct. 22-25, 2002.
  12. Advances in Kernel Methods for Signal Processing Workshop, International Conference on Neural Networks. Madrid (Spain), Aug. 27, 2002.
- Editorial Board: ISRN Signal Processing and Journal of Applied Mathematics.
- First prize, Aula Uni2, Best Journal paper, Ph.D. thesis.
- Head of the Signal Theory and Communications Department at University Carlos III Madrid, 2010-2012.
- Docent secretariat, Signal Theory and Communications Department, University Carlos III Madrid, 2002-2003.
- President, Student Council, University of Sevilla, 1995-1996.