

# Isabel Valera

## Curriculum Vitae

MPI for Software Systems

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### Research Interests

My research turns around the development of general machine learning methods that leverage the availability of data to solve real-world problems. In particular, I have three main goals in my research: i) capturing complex real-world phenomena, which often involve being able to ii) handle time-dependent, unstructured and heterogeneous data, and iii) provide interpretable results that allow us to better understand these phenomena, i.e., to include humans in the loop.

I have extensive expertise in probabilistic modeling, including Bayesian nonparametric models, as well as discrete- and continuous-time models such as HMMs and temporal point processes, respectively. My learning approaches include approximate Bayesian inference, e.g., Monte Carlo and variational methods, as well as convex optimization. I am interested in diverse applications which range from bioengineering and psychiatry to social and communication systems.

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### Positions

- 2017 **Post-Doctoral Researcher**, *Department of Engineering, University of Cambridge, UK.*
- 2015–2017 **Humboldt Post-Doctoral Fellowship Holder**, *Host: Max Planck Institute for Software Systems, Germany.*
- 2015 **Post-Doctoral Researcher**, *Max Planck Institute for Software Systems, Germany.*
- 2012–2015 **Research Assistant for Dr. Leiva-Murillo**, *Universidad Carlos III de Madrid, Spain.*  
Project: AGES-CM S2010/BMD-2422
- 2014 **Visiting Researcher**, *University of Cambridge, UK.*  
Supervisor: Prof. Ghahramani
- 2013 **Intern**, *Max Planck Institute for Software Systems, Germany.*  
Supervisors: Dr. Gummadi and Dr. Gomez-Rodriguez
- 2010–2012 **MSc. Studentship**, *Universidad Carlos III de Madrid, Spain.*
- 2010 **Research Assistant for Dr. Míguez**, *Universidad Carlos III de Madrid, Spain.*  
Project: Consolider-COMONSENS (<http://www.comonsens.org/>)
- 2008–2009 **ERASMUS (European Region Action Scheme for the Mobility of University Students) Studentship**, *Leibniz Universität Hannover, Germany.*
- 2003–2009 **Spanish Ministry of Education and Science Studentship for undergraduates**, *Universidad Politécnica de Cartagena, Spain.*

## Education

- 2012–2014 **PhD. in Multimedia and Communications**, Supervisor *Fernando Perez-Cruz*, Universidad Carlos III de Madrid, Spain.  
Doctoral Dissertation: *“Bayesian Nonparametric Modeling of Psychiatric Disorders.”*
- 2010–2012 **MSc. in Multimedia and Communications (Data and Signal Processing)**, Universidad Carlos III de Madrid, Spain.
- 2008–2009 **Bachelor’s Final Project**, Leibniz Universität Hannover, Germany.  
Title: *“A hybrid SS-ToA wireless geolocation based on path attenuation: Robustness investigation under imperfect path loss exponent.”*
- 2003–2009 **Electrical Engineering (Signal Processing and Communications)**, Universidad Politécnica de Cartagena, Spain.

## Teaching Experience

- 2016 **Teaching a practical session on Machine Learning for Networks**, Machine Learning Summer School 2016, Cadiz, Spain.
- 2015/2016 **Teaching the Social and Information Networks Seminar**, TU Kaiserslautern, Germany.
- 2010/2012 **Teaching Assistant in Digital Communications, Communication System Design and Simulation and Advanced Techniques for Signal Processing and Communications**, Universidad Carlos III de Madrid, Spain.

## Computer skills

OS WINDOWS, MACOS  
Programming MATLAB, C, C++

## Languages

Spanish **Native Language**  
English **Excellent**  
German **Basic**

## Other merits

- 2017 **Co-organizer of the Data Learning and Inference Conference (DALI 2017)**, Tenerife, Spain, April 2017.
- 2016 **Co-organizer of the Women in Machine Learning Workshop (WiML 2016)**, Barcelona, Spain, December 2016.
- 2016 **Co-organizer of the Machine Learning Summer School (MLSS 2016)**, Cadiz, Spain, May 2016.
- 2014 **Google Travel Award to attend NIPS Conference**, Montreal, Canada.
- 2013 **Travel Award from 9th Bayesian Nonparametric Conference**, Amsterdam, Netherlands.
- 2012 **Travel Award from NIPS Conference**, Lake Tahoe, USA.

- 2012 **Volunteer at AISTATS Conference**, La Palma, Spain.  
2011 **Volunteer at NIPS Conference**, Granada, Spain.

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## Referees

**Zoubin Ghahramani**, *Professor at the Department of Engineering, University of Cambridge.*

Email: [zoubin@eng.cam.ac.uk](mailto:zoubin@eng.cam.ac.uk); Tel: +44 1223 748 531

**Fernando Perez-Cruz**, *Associate Professor at Stevens Institute of Technology.*

Email: [fperezcr@stevens.edu](mailto:fperezcr@stevens.edu); Tel: +1 (201) 216 3381

**Manuel Gomez-Rodriguez**, *Tenure-track research group leader at MPI-SWS.*

Email: [manuelgr@mpi-sws.org](mailto:manuelgr@mpi-sws.org); Tel: +49 631 9303-8301

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## Publications

### Thesis

- [1] **I. Valera**, *Bayesian Nonparametric Modeling of Psychiatric Disorders*, Ph.D. Thesis, Department of Signal Processing and Communications, Universidad Carlos III de Madrid. November, 2013.

### Journals

- [2] **I. Valera, F. J. R. Ruiz, P. M Olmos, C. Blanco and F. Perez-Cruz**, *Infinite Continuous Feature Model for Psychiatric Comorbidity Analysis*, *Neural Computation* 28, 354 - 381, 2016.
- [3] **I. Valera, F. J. R. Ruiz and F. Perez-Cruz**, *Infinite Factorial Unbounded-State Hidden Markov Model*, *IEEE Transactions on Pattern Analysis and Machine Intelligence* PP, 1, 2015.
- [4] **F. J. R. Ruiz, I. Valera, C. Blanco and F. Perez-Cruz**, *Bayesian Non-parametric Comorbidity Analysis of Psychiatric Disorders*, *Journal of Machine Learning Research* 15, 1215-1247, 2014.
- [5] **I. Valera, B. T. Sieskul and J. Míguez**, *On the Maximum Likelihood Estimation of the ToA under an Imperfect Path Loss Exponent*, *EURASIP Journal on Wireless Communications and Networking*, Volume 2013.

### Conferences

- [6] **B. Zafar, I. Valera, M. Gomez-Rodriguez and K. Gummadi**, *Training Fair Classifiers*, 20th International Conference on Artificial Intelligence and Statistics (AISTATS), Florida (USA), April 2017.
- [7] **B. Tabibian, I. Valera, M. Farajtabar, L. Song, B. Schoelkopf and M. Gomez Rodriguez**, *Distilling Information Reliability and Source Trustworthiness from Digital Traces (Full paper)*, 26th International World Wide Web Conference (WWW), Perth (Australia), April 2017.

- [8] **C. Mavroforakis, I. Valera and M. Gomez-Rodriguez**, *Modeling the Dynamics of Online Learning Activity (Full paper)*, 26th International World Wide Web Conference (WWW), Perth (Australia), April 2017.
- [9] **B. Zafar, I. Valera, M. Gomez-Rodriguez and K. Gummadi**, *Fairness Beyond Disparate Treatment & Disparate Impact: Learning Classification without Disparate Mistreatment (Full paper)*, 26th International World Wide Web Conference (WWW), Perth (Australia), April 2017.
- [10] **U. Upadhyay, I. Valera and M. Gomez-Rodriguez**, *Uncovering the Dynamics of Crowdlearning and the Value of Knowledge*, The 10th ACM International Conference on Web Search and Data Mining (WSDM), Cambridge (UK), February 2017.
- [11] **I. Valera and Z. Ghahramani**, *Automatic Discovery of the Statistical Types of Variables in a Dataset*, Workshop on Artificial Intelligence for Data Science at Neural Information Processing Systems Conference 2016 (NIPS 2016), Barcelona (Spain), 2016.
- [12] **A. De, I. Valera, N. Ganguly, S. Bhattacharya and M. Gomez Rodriguez**, *Learning and Forecasting Opinion Dynamics in Social Networks*, Neural Information Processing Systems Conference 2016 (NIPS 2016), Barcelona (Spain), December 2016.
- [13] **U. Upadhyay, I. Valera and M. Gomez-Rodriguez**, *Uncovering the Dynamics of Crowdlearning and the Value of Knowledge*, Workshop on Machine learning for Education at Neural Information Processing Systems Conference 2016 (NIPS 2016), Barcelona (Spain), December 2016.
- [14] **B. Zafar, I. Valera, M. Gomez-Rodriguez and K. Gummadi**, *Fairness Beyond Disparate Treatment and Disparate Impact: Learning Classification without Disparate Mistreatment*, Workshop in Fairness, Accountability and Transparency in Machine Learning (FATML 2016), New York (USA), November 2016.
- [15] **B. Tabibian, M. Farajtabar, I. Valera, L. Song, B. Schoelkopf and M. Gomez Rodriguez**, *On the Reliability of Information and Trustworthiness of Web Sources in Wikipedia*, Wiki Workshop at the 10th International AAAI Conference on Web and Social Media (ICWSM 2016), Cologne (Germany), May 2016.
- [16] **M. Babaei, P. Grabowicz, I. Valera and M. Gomez-Rodriguez**, *On the Efficiency of the Information Networks in Social Media*, The 9th ACM International Conference on Web Search and Data Mining (WSDM), San Francisco (CA, USA), February 2016.
- [17] **C. Mavroforakis, I. Valera and M. Gomez-Rodriguez**, *Hierarchical Dirichlet Hawkes Process for Modeling the Dynamics of Online Learning Activity*, Workshop on Networks in the Social and Information Sciences at Neural Information Processing Systems Conference 2015 (NIPS 2015), Montreal (Canada), December 2015.

- [18] **I. Valera, F. J. R. Ruiz, L. Svensson and F. Perez-Cruz**, *Infinite Factorial Dynamical Model*, Neural Information Processing Systems Conference 2015 (NIPS 2015), Montreal (Canada), 2015.
- [19] **I. Valera and M. Gomez-Rodriguez**, *Modeling Adoption and Usage Frequency of Competing Products and Conventions in Social Media*, IEEE International Conference on Data Mining (ICDM 2015), Atlantic City (NJ, USA), 2015.
- [20] **I. Valera, F. J. R. Ruiz, L. Svensson and F. Perez-Cruz**, *A Bayesian Nonparametric Approach for Blind Multiuser Channel Estimation*, Invited talk at the special session on Bayesian non-parametrics for signal and image processing at the European Signal Processing Conference 2015 (EUSIPCO 2015), Nice (France), August 2015.
- [21] **B. Zafar, I. Valera, M. Gomez-Rodriguez and K. Gummadi**, *Fairness Constraints: A Mechanism for Fair Classification*, Workshop in Fairness, Accountability and Transparency in Machine Learning, 32nd International Conference on Machine Learning (ICML), Lille (France), July 2015.
- [22] **M. Babaei, P. Grabowicz, I. Valera and M. Gomez-Rodriguez**, *On the Users' Efficiency in the Twitter Information Network*, Short paper at the 9th International AAAI Conference on Web and Social Media (ICWSM2015), Oxford (UK), May 2015.
- [23] **I. Valera, M. Gomez-Rodriguez and K. Gummadi**, *Modeling Adoption and Usage Frequency of Competing Products and Conventions in Social Media*, Workshop in "Networks: From Graphs to Rich Data" at Neural Information Processing Systems Conference 2014 (NIPS 2014), Montreal (Canada), Dec. 2014.
- [24] **M. F. Pradier, P. G. Moreno, F. J.R. Ruiz, I. Valera, H. Mollina-Bulla and F. Perez-Cruz**, *Map/Reduce Uncollapsed Gibbs Sampling for Bayesian Non Parametric Models*, Workshop in Software Engineering for Machine Learning at Neural Information Processing Systems Conference 2014 (NIPS 2014), Montreal (Canada), Dec. 2014.
- [25] **M. Farajtabar, N. Du, I. Valera, L. Song, M. Gomez-Rodriguez, H. Zha**, *Shaping Social Activity by Incentivizing Users*, Neural Information Processing Systems Conference 2014 (NIPS 2014), Montreal (Canada), Dec. 2014.
- [26] **I. Valera and Z. Ghahramani**, *General Table Completion using a Bayesian Nonparametric Model*, Neural Information Processing Systems Conference 2014 (NIPS 2014), Montreal (Canada), Dec. 2014.
- [27] **I. Valera, F. J. R. Ruiz and F. Perez-Cruz**, *Infinite Factorial Unbounded Hidden Markov Model For Blind Multiuser Channel Estimation*, 4th International Workshop on Cognitive Information Processing (CIP 2014), Copenhagen (Denmark), May 2014.

- [28] **F. J. R. Ruiz, I. Valera, P. M. Olmos, C. Blanco and F. Perez-Cruz**, *Infinite Continuous Feature Model for Psychiatric Comorbidity Analysis*, Workshop in Machine Learning for Clinical Data Analysis and Healthcare at Neural Information Processing Systems Conference 2013 (NIPS 2013), Lake Tahoe (USA), Dec. 2013.
- [29] **F. J. R. Ruiz, I. Valera, C. Blanco and F. Perez-Cruz**, *Bayesian Non-parametric Comorbidity Analysis of Psychiatric Disorders*, 9th Conference on Bayesian Nonparametrics, Amsterdam (Netherlands), May 2013.
- [30] **F. J. R. Ruiz, I. Valera, C. Blanco and F. Perez-Cruz**, *Bayesian Nonparametric Modeling of Suicide Attempts*, Neural Information Processing Systems Conference 25:1862-1870 (spotlight), Lake Tahoe (USA), Dec. 2012.
- [31] **M. I. Valera Martinez, B. T. Sieskul, F. Zheng, and T. Kaiser**, *A Hybrid SS-ToA Wireless Geolocation Based on Path Attenuation under Imperfect Path Loss Exponent*, 2010 European Signal Processing Conference (EUSIPCO-2010), Aalborg (Denmark), August 2010.
- [32] **B. Florentino, I. Valera, M. De Prado, A. Arenal, A. Artés**, *Un ejemplo de minería de datos (An example of data mining)*, Congreso Anual de la Sociedad Española de Ingeniería Biomédica 2010 (CASEIB 2010), Madrid (Spain), Nov. 2010.