Curriculum Vitae

Mélanie natividad Fernández Pradier

Contact information

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Research interests

Bayesian deep models, interpretable machine learning, personalized healthcare, Bayesian nonparametrics, approximate variational inference, statistical methods for biomedical applications, information theory.

Education

2017/10–current	Postdoctoral Fellowship at Harvard University, co-sponsored by the Center for Research on Computation and Society (CRCS) and the Harvard Data Science Initiative (HDSI).
2013/03–2017/09	PhD sponsored by the Marie Curie UE-FP7-People-ITN: "Machine Learning for Personalized Medicine" at University Carlos III in Madrid (UC3M).
	Doctoral thesis: "Bayesian nonparametric models for data exploration" at University Carlos III in Madrid. Grade A with Honours.
2008/09–2011/02	MSc. in Information Technology at University of Stuttgart, major in communications.
	Master thesis: "Emotion recognition in speech signals and perception of music" at University of Stuttgart. Grade A with Honours.
	Bachelor thesis: "Bound comparison for DOA estimation in antenna arrays" at University of Stuttgart. Grade A with Honours.
2007/09–2009/09	Mathematics (four-year diploma) at the National University of Distance Education in Spain (UNED). Two years completed successfully.
2004/09–2011/02	Telecommunication Engineering (five-year diploma) at the Technical University of Madrid (UPM), Spain.
1995–2004	Secondary Education at the "Lycée Français de Madrid", Spain. "*Diplôme du Baccalauréat Géneral, Série Scientifique, Mention Très Bien avec félicitations du Jury*".

Language knowledge

Spanish	native
French	native
English	fluent, Cambridge Certificate in Advanced English, 2007
Japanese	fluent, Japanese Language Proficiency Test, level 2, 2006
German	advanced, TestDaF Certificate level C1, 2011
Chinese	basic, Chinese Proficiency Test (HSK) level B, 2008

Publications

Journals

coming soon	I. Valera, **M. F. Pradier**, M. Lomeli, and Z. Ghahramani, *General Bayesian Nonparametric Latent Feature Model.* Accepted at Journal of Machine Learning Research (JMLR), 2020.
coming soon	M. C. Hughes, **M. F. Pradier**, A. S. Ross, T. H. McCoy, R. H. Perlis and F. Doshi-Velez. *Generating interpretable predictions about antidepressant treatment stability using supervised topic models.* Accepted to JAMA Psychiatry. 2020.
2020/02	**M. F. Pradier**, T. H. McCoy, M. Hughes, R. H. Perlis and F. Doshi-Velez. *Predicting Treatment Discontinuation after Antidepressant Initiation.* Nature Translational Psychiatry. 2020.

2019/11 **M. F. Pradier**, M. C. Hughes, T. H. McCoy, S. Barroilhet, F. Doshi-Velez and R. H. Perlis. *Predicting Transition from Mayor Depression to Bipolar Disorder after Antidepressant Initiation.* In submission to American Journal of Psychiatry. 2019.

2019/09 S. Stark, S. L. Hyland, **M. F. Pradier**, K. Lehmann, A. Wicki, F. Perez-Cruz, J. E. Vogt, and G. Ratsch. *Unsupervised Extraction of Phenotypes from Cancer Clinical Notes for Association Studies.* In submission to Nature Communications. 2019.

2019/01 **M. F. Pradier**, B. Reis, L. Jukofsky, F. Milletti, T. Ohtomo, F. Perez-Cruz, and O. Puig, *Case-control Indian Buffet Process identifies biomarkers of response to Codrituzumab.* BMC Cancer, 2019.

2018/03 **M. F. Pradier***, Z. Utkovski*, V. Stojkoski, L. Kocarev and F. Perez-Cruz, *Economic Complexity Unfolded: An Interpretable Model for the Productive Structure of Economies.* PLoS One, 2018.

2016/06 **M. F. Pradier**, P. M. Olmos, and F. Perez-Cruz, "*Entropy-Constrained Scalar Quantization with a Lossy-Compressed Bit*". Entropy 2016, 18(12), 449; doi: 10.3390/e18120449

2016/01 **M. F. Pradier**, F. J. R. Ruiz and F. Perez-Cruz. "*Prior Design for Dependent Dirichlet Processes: An Application to Marathon Modeling*". PLoS One 2016, 11(1): e0147402. doi: 10.1371/journal.pone.0147402

Conferences and Workshops

2020/02 B. Coker, **M. F. Pradier**, and F. Doshi-Velez. *Towards Expressive Priors for Bayesian Neural Networks: Poisson Process Radial Basis Function Networks.* In submission to Uncertainty in Artificial Intelligence (UAI). 2020.

2019/11 **M. F. Pradier**, M. C. Hughes, and F. Doshi-Velez. *Challenges in Computing and Optimizing Upper Bounds of Marginal Likelihood based on Chi-Square Divergences.* Advances in Approximate Bayesian Inference Workshop (AABI). 2019.

2019/11 M. Jacobs, **M. F. Pradier**, E. Mynatt, R. H. Perlis, F. Doshi-Velez, and K. Z. Gajos. Integrating AI Recommendations into the Pharmacologic Management of Major Depressive Disorder. ACM Conference on Computer-Supported Cooperative Work and Social Computing (ACM-CSCW). 2019.

2019/06 W. Yang, L. Lorch, M. A. Graule, S. Srinivasan, A. Suresh, J. Yao, **M. F. Pradier**, and F. Doshi-Velez. *Output-Constrained Bayesian Neural Networks.* Paper + Spotlight talk at ICML Workshop on Generalization. 2019.

2019/04 **M. F. Pradier**, S. L. Hyland, S. Stark, K. Lehmann, J. E. Vogt, F. Perez-Cruz, and G. Ratsch. *A Bayesian Nonparametric Approach to Discover Clinico-Genetic Associations across Cancer Types.* BioArXiv. 2019.

2018/12 **M. F. Pradier**, W. Pan, J. Yao, S. Ghosh, and F. Doshi-Velez. *Projected BNNs: Avoiding Pathologies in Weight Space by projecting Neural Network Weights.* Bayesian Deep Learning BDL@NeurIPS. Montreal (Canada), Dec 2018.

2018/12 **M. F. Pradier**, W. Pan, M. Yau, R. Singh, and F. Doshi-Velez. *Hierarchical Stick-breaking Paintbox.* Paper + Spotlight talk at Bayesian Non-Parametrics BNP@NeurIPS. Montreal (Canada), Dec 2018.

2018/04 **M. F. Pradier**, V. Stojkoski, Z. Utkovski, L. Kocarev, and F. Perez-Cruz. *Sparse 3-parameter Restricted Indian Buffet Process for Understanding International Trade.* IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP). Calgary (Canada), April 2018.

2017/08 I. Valera, **M. F. Pradier**, and Z. Ghahramani. *General Latent Feature Modeling for Data Exploration Tasks.* Best Paper Award at Workshop on Human Interpretability in Machine Learning WHI@ICML. Sydney (Australia), Aug 2017.

2015/10 **M. F. Pradier** and F. Perez-Cruz. *Infinite Mixture of Global Gaussian Processes.* Bayesian Non-Parametrics BNP@NIPS. Montreal (Canada), Dec 2015.

2015/12 S. Stark, **M. F. Pradier**, S. Hyland, J. E. Vogt, F. Perez-Cruz and G. Rätsch. *Large-Scale Sentence Clustering from Electronic Health Records for Genetic Associations in Cancer.* Paper + Spotlight talk at Machine Learning in Computational Biology MCB@NIPS. Montreal (Canada), Dec 2015.

2015/12 **M. F. Pradier**, T. Karaletsos, S. Stark, J. E. Vogt, and F. Perez-Cruz. *Bayesian Poisson Factorization for Genetic Associations with Clinical Features in Cancer*, Machine Learning for Healthcare ML4H@NIPS. Montreal (Canada), Dec 2015.

2014/12 **M. F. Pradier**, P. G. Moreno, F. J.R. Ruiz, I. Valera, H. Molina-Bulla and F. Perez-Cruz, *Map/Reduce Uncollapsed Gibbs Sampling for Bayesian Non Parametric Models.* Paper + Spotlight talk at Software Engineering for Machine Learning SW4ML@NIPS. Montreal (Canada), Dec 2014.

Awards and Honors

2019/11	Best Paper Award + Contributed Talk. Weakly Supervised Learning, ACML 2019.
2017/09	Best Dissertation Award (*premio extraordinario de doctorado*): University Carlos III in Madrid.
2017/07	Best Paper Award + Contributed Talk. Workshop on Human Interpretability in Machine Learning, ICML 2017.
2016/12	Travel Award + Contributed Talk. Bayesian Non-parametrics Workshop, NIPS 2016.
2015/12	Travel Award + Spotlight Talk. Machine Learning in Computational Biology, NIPS 2015.
2015/04	Spotlight Talk Award at the 9th Annual Machine Learning Symposium, New York Academy of Sciences, New York, USA.
2013/03	Marie-Curie UE-FP7-People-ITN PhD Fellowship "Machine Learning for Personalized Medicine" (3-year highly competitive scholarship).
2008/10	Winner of the 2008 Essay Contest held by the Ministry of Foreign Affairs of Japan, representative of Spain in a 10-day Japan tour.
2008/06	Special Mention for Outstanding Academic Performance, bestowed to the 3 best students in the first cycle of Telecommunications Engineering at UPM.
2006–2007	Scholarship of Excellence awarded by the Community of Madrid.
2005/07	Lucent Global Sciences Scholarship, organized by Lucent Foundation and Bell Labs. Visit of the Bell Laboratories in New Jersey, USA.
2004/06	"*Diplôme du Baccalauréat Géneral, Série Scientifique, Mention Très Bien avec félicitations du Jury*" Special Mention after High School Education.

Technical Patents

2015/04/09	Patent approved in the United States (Pub. No: 20150099254).
2014/01/30	Technical patent of an Information Processing Device for Adaptive Learning in Japan (Pub. No: WO/2014/017164).

Selected Talks

2019/06/21	*Applications of latent variable models for data exploration and uncertainty quantification.* Columbia University Data Science Institute, New York City, United States.
2019/03/20	*Probabilistic modeling for biomedical applications.* Center for Quantitative Health, Massachusetts General Hospital, Cambridge, United States.
2018/11/19	*Proj-BNNs: Avoiding weight-space pathologies by projecting neural network weights.* IBM Research, Cambridge, United States.
2017/03/05	*CRCS seminar: Bayesian nonparametrics for data exploration.* Harvard University, Cambridge, United States.
2016/05/21	*Bayesian nonparametrics for data exploration: An application to international trade.* BBVA Data & Analytics, Madrid, Spain.
2016/05/21	*A Bayesian nonparametric approach to understand world economies.* Audiovisual Communications Lab in EPFL, Lausanne, Switzerland.
2016/05/21	*Bayesian modeling for biomarker discovery in clinical trials.* "Big data in human genetics: opportunities and challenges?" Workshop at European Society of Human Genomics. ESHG 2016, Barcelona, Spain.
2016/01/11	*Indian Buffet Process for Biomarker Discovery.* Roche Innovation Center, New York, United States.
2015/10/21	*Machine learning for personalized medicine.* Gregorio Marañon Health Research Institute, Madrid, Spain.
2015/07/09	*Bayesian nonparametrics and variational inference: A brief introduction.* Signal Processing Dpt at the Technical University of Madrid.
2015/03/03	*Probabilistic analysis of genetic associations with clinical features in cancer.* Spotlight Talk Award at the 9th Annual Machine Learning Symposium at New York Academy of Sciences, New York, United States.
2015/02/05	*An introduction to Bayesian nonparametrics for biological applications.* Computational Biology Dpt., Memorial Sloan-Kettering Cancer Center, New York, United States.

Research stays and Work in Industry

2016/07	1-month Research Stay: "*Non-linear latent feature model of genetic populations*" at Medical Genomics Unit of the University of Liège, Belgium.
2015/07–2015/09	3-months Research Internship: "*Statistical Methods for Biomarker Discovery*" at Roche Translational & Clinical Research Center, New York, USA.
2014/10–2015/06	9-months Research Internship: *"Genetic Association Studies with Clinical Observations in Cancer*" at the Memorial Sloan-Kettering Cancer Center, New York, USA.
2011/07–2012/07	1-year Research Engineer: "*Adaptive Learning Technologies and Serious Games*" at R&D Sony Corporation, Tokyo, Japan (accepted patents).
2009/10–2010/07	9-months Research Internship: "*Personalisation and Recommendation Systems*" at Sony European Technology Center, Stuttgart, Germany.

Teaching Experience

06/2019-07/2019	Lecturer for "Introduction to Machine Learning and Statistics.", Master Course in Computer Science and Engineering. Rwanda University, African Center of Excellence in Data Science, Kigali.
2016-2017	Lecturer for "Digital Communications", 4th year of Bachelor's Degree in Audiovisual System Engineering. UC3M, Madrid.
2016-2017	Lecturer for "Digital Communications", 4th year of Bachelor's Degree in Computer Science and Engineering. UC3M, Madrid.
2015-2016	Teaching Fellow for "Linear Systems and Circuits", 1st year of Bachelor's Degree in Telecommunication Engineering. UC3M, Madrid.

Academic Service

Journals and Beyond

2020	ACM CHIL 2020, Harvard Data Science Research Funds.
2019	PeerJ, *Biomarkers in medicine* journal.
2019	Research proposals for: *Swiss Data Science Center*, Harvard Data Science Initiative.
2016	Workshop co-organizer "Big data in human genetics: opportunities and challenges?" at the *European Society of Human Genomics*, 2016.
2015	*Bioinformatics* journal.

Conferences and Workshops

2020	Reviewer at AISTATS, Reproducibility Challenge NeurIPS
2019	NeurIPS, AISTATS, HCML@NeurIPS, Reproducibility Challenge ICLR, Advances in Approximate Bayesian Inference (AABI).
2018	*Bayesian Nonparametrics* BNP@NeurIPS, *Machine Learning for Healthcare* ML4H@NeurIPS, *Bayesian Deep Learning*, BDL@NeurIPS, AABI.
2017	ICML, NeurIPS, AAAI, ML4H@NeurIPS, *Women in Machine Learning* WiML@NeurIPS.
2015	AISTATS, BNP@NeurIPS.
2014	BNP@NeurIPS.

Academical activities

2015/09	"Machine Learning for Personalized Medicine" (MLPM) Summer School, Manchester, UK.
2014/09	MLPM Summer School at Marie Curie Institute, Paris, France.
2013/09	MLPM Summer School at Max Planck Institute, Tübingen, Germany.
2013/08	"Advanced topics in Machine Learning" at Technical University of Denmark.
2013/05	"Probabilistic Machine Learning" Seminar at UC3M, Spain.
2013/04	European School of Information Theory in Ohrid, Republic of Macedonia.
2013/01	"Large-Scale Optimisation" Seminar at UC3M, Spain.

Special activities

07/2019	Volunteer Lecturer at the African Center of Excellence in Data Science. Kigali, Rwanda.
02/2016	Volunteer Activities for scientific diffusion in 3 high-schools in Madrid.
2015-2017	Organizer of the "Machine Learning Reading Club" at UC3M.
2014/12	Volunteer staff at "Advances in Neural Information Processing Systems", NIPS 2014.
2013/08	Technical Support at "Information Theory Workshop" in Seville, Spain.
2012/10-2012/11	Entrepreneurship Simulator Contest, held by Community of Madrid.
2008/07	Board of European Students of Technology (BEST) program in Yekaterinburg, Russia.
2005/08	Volunteer program for a month, to help with the conservation of kangaroos and wallabies in danger of extinction in Rockhampton, Australia.
2005–2007	Vice-chair and then Chair of the local IEEE Student Branch at the UPM.

Technical skills

- Programming skills: Python, Matlab; Vim, Haskell, Java, basic Scala.
- Experience working with huge databases (such as the PlayStation DB) using mySQL.
- Basic knowledge of Praat software, R, Eclipse platform, Spring framework, Hibernate.

Other skills and interests

- Adventure: e.g. canoeing 200 km in Quebec, cycling 500 km through Brittany.
- Sports: Inferno Hot Pilates Instructor, Yoga (2 year), Half-marathon in sub-2hours, Platinum Ice Skater (7 years), Kung Fu (6 years).
- Music: piano (6 years as an amateur), singing for 2 years in the UPM University Chorus in Madrid.
- Asia: Self-study of Japanese and Chinese, amateur Go player (participation in more than 10 international tournaments).

February 28th, 2020