

José Bento Ayres Pereira

CONTACT INFORMATION	Computer Science Department St. Mary's Hall, 2nd floor S., Boston College, Chestnut Hill, MA 02467	office: +001 617 552 1780 e-mail: jose.bento@bc.edu
RESEARCH INTERESTS	Machine-learning, probabilistic graphical models, distributed and parallel optimization algorithms. Applications to multi-robot control, computer vision/graphics, biology.	
EDUCATION	Boston College , Chestnut Hill, Massachusetts, USA <i>Assistant Professor</i>	2014 – present
	Disney Research Boston , Cambridge, Massachusetts, USA <i>Post Doctoral Researcher</i>	2012 – 2014
	<ul style="list-style-type: none">• Advisor: Jonathan Yeddida	
	Stanford University , Stanford, California, USA <i>Doctor of Philosophy</i>	2008 – 2012
	<ul style="list-style-type: none">• Principal advisor: Professor Andrea Montanari• Co-advisor: Professor Iain Johnstone	
	<i>Master's Program</i>	2006 – 2008
	Porto University , Porto, Portugal <i>Engineering Degree</i>	2001 – 2006
GRANTS, HONORS AND AWARDS	Predicting the emergence of antibiotic resistance through multi-omics approaches and Immune System-surveillance PI (22.5%) NIH-NIAID, 2016–Present Disney Inventor Award for patent application “Method and Device For Three-Weight Message-Passing Optimization Scheme”, 2014 RecSys-CAMRa Challenge winner with work “Identifying users from their rating patterns”, 2011 SIGWEB DocEng Best paper award with the paper “Probabilistic document model”, 2011 Doctoral Fellowship from Fundação para a Ciência e Tecnologia, Portugal, 2007-2010 Stanford University, Electrical Engineering, Departmental Fellowship, 2006 - 2007 Prize Infineon Technologies (top graduating student class of 2006), 2006 Porto University Engineering merit scholarship award (top 10 students), 2002-2006	
JOURNAL PUBLICATIONS	T. van Opijnen, S. Dedrick, J. Bento, “Strain dependent genetic networks for antibiotic-sensitivity in a bacterial pathogen with a large pan-genome”, Plos Pathogens 2016 N. Ben-Zvi, J. Bento, M. Mahler, J. Hodgins, A. Shamir, “Line-Drawing Video Stylization”, Computer Graphics Forum, 2015. J. Bento, M. Ibrahim, “Support Recovery for the Drift Coefficient of High-Dimensional Diffusions”, IEEE Transactions on Information Theory, 2013.	
CONFERENCE PUBLICATIONS	G. Frana, J. Bento, “An explicit rate bound for the over-relaxed ADMM”, IEEE International Symposium on Information Theory (ISIT), 2016. N. Hao, A. Oghbaee, M. Rostami, N. Derbinsky, J. Bento, “Testing fine-grained parallelism for the ADMM on a factor-graph”, Proc. of the Sixth IEEE Workshop on Parallel Computing and Optimization, (IPDPS) 2016. C. Mathy, F. Gonda, D. Schmidt, N. Derbinsky, A. Alemi, J. Bento, F. Delle Fave, J. Yeddida, “SPARTA: Fast global planning of collision-avoiding robot trajectories”, <i>Workshops In Advances in Neural Information Processing Systems (NIPS)</i> , 2015.	

J. Bento, N. Derbinsky, C. Mathy, J. Yedidia, “Proximal operators for multi-agent path planning”, *Proceedings of the 29th National Conference on Artificial Intelligence (AAAI)*, 2015.

J. Bento, N. Derbinsky, C. Mathy, J. Yedidia, “Proximal operators for multi-agent path planning”, *Proceedings of the 29th National Conference on Artificial Intelligence (AAAI)*, 2015.

C. Mathy, N. Derbinsky, J. Bento, J. Yedidia, “The boundary forest algorithm for online supervised and unsupervised learning”, *Proceedings of the 29th National Conference on Artificial Intelligence (AAAI)*, 2015.

D. Krishnan, B. Freeman, J. Bento, D. Zoran, “Shape and Illumination from Shading using the Generic Viewpoint Assumption”, *In Advances in Neural Information Processing Systems (NIPS)*, 2014.

J. Bento, N. Derbinsky, J. Mora, J. Yedidia, “A message-passing algorithm for multi-agent trajectory planning”, *In Advances in Neural Information Processing Systems (NIPS)*, 2013.

N. Derbinsky, J. Bento, J. Yedidia, “Methods for integrating knowledge with the Three-Weight optimization algorithm for hybrid cognitive processing”, *AAAI Fall Symposium on Integrated Cognition*, 2013.

J. Bento, S. Ioannidis, S. Muthukrishnan, and J. Yan, “A time and space efficient algorithm for contextual linear bandits”, *Proceedings of the European Conference in Machine Learning and Principles and Practice of Knowledge Discovery in Databases (ECML PKDD)*, 2013.

N. Damera, J. Bento, “Ad insertion in automatically composed documents”, *Proceedings of the 12th ACM Symposium on Document Engineering (DocEng)*, 2012.

J. Bento, N. Fawaz, A. Montanari, S. Ioannidis, “Identifying users from their rating patterns”, *Proceedings of the 5th ACM Conference on Recommender Systems (RecSys)*, 2011.

N. Damera, J. Bento, E. O’Brien, “Probabilistic document model”, *Proceedings of the 11th ACM Symposium on Document Engineering (DocEng)*, 2011.

J. Bento, M. Ibrahimi, A. Montanari, “Information theoretic limits on learning stochastic differential equations”, *IEEE International Symposium on Information Theory (ISIT)*, 2011.

M. Bayati, J. Bento, A. Montanari, “The LASSO Risk: asymptotic results and real world examples”, *In Advances in Neural Information Processing Systems (NIPS)*, 2010.

J. Bento, M. Ibrahimi, A. Montanari, “Learning networks of stochastic differential equations”, *In Advances in Neural Information Processing Systems (NIPS)*, 2010.

J. Bento, A. Montanari, “Which graphical models are difficult to learn?”, *In Advances in Neural Information Processing Systems (NIPS)*, 2009.

TECHNICAL
REPORTS

J. Bento, “A metric for sets of trajectories that is practical and mathematically consistent”, *arXiv:1601.03094v1 [cs.CV]*, 2016.

N. Derbinsky, J. Bento, V. Elser, J. Yedidia, “An improved three-weight message-passing algorithm”, *arXiv:1305.1961 [cs.AI]*, 2013.

J. Bento, “Learning graphical models, fundamental limits and efficient algorithms”, *PhD Dissertation*, 2012.

J. Bento, A. Montanari, “On the trade-off between complexity and correlation decay in structural learning algorithms”, *arXiv:1110.1769 [stat.ML]*, 2011.

INVITED
PRESENTATIONS

“A metric for sets of trajectories”, *Disney Research, Pittsburg*, July 2016.

“An explicit rate bound for the over-relaxed ADMM”, *ISIT, Barcelona*, July 2016.

“Testing fine-grained parallelism for the ADMM on a factor-graph”, *GPU Technology Conference*, April 2016

“A metric for sets of trajectories”, *B-Spiral, Northeastern University*, March 2016.

“An explicit rate bound for the over-relaxed ADMM”, *School of Engineering, Porto University*, February 2016.

“Learning stochastic differential equations”, *NIPS 2015 Workshop on Modeling and inference for dynamics on complex interaction networks: joining up machine learning and statistical physics*, Montréal, December 2015.

“Variations on the Alternating Direction Method of Multipliers”, *Graphical Models, Statistical Inference, and Algorithms workshop*, University of Minnesota, May 2015.

“Towards understanding the Boundary Forest algorithm”, *New England Machine Learning Day, Microsoft Research, Cambridge*, May 2015.

“Towards understanding the Boundary Forest Algorithm”, *School of Science, Porto University*, May 2015.

“A metric for sets of trajectories”, *School of Engineering, Porto University*, January 2015.

“The Three-Weight Algorithm: a method for large scale distributed optimization”, *Department of Electrical and Computer Engineering, Texas A&M University*, March 2014.

“The Three-Weight Algorithm: a method for large scale distributed optimization”, *Center for Information and Systems Engineering, Boston University*, January 2014.

“Message-passing algorithms for general-purpose optimization based on ADMM ”, *Information System Lab. Colloquium, Stanford University*, August 2013.

“Improved message-passing algorithm incorporating uncertainty information”, *New England Machine Learning Day, Microsoft Research, Cambridge*, May 2013.

“Algorithms and fundamental limits in learning stochastic differential equations”, *Electrical and Computer Engineering Department, Boston University*, April 2013.

“A time and space efficient algorithm for contextual linear bandits”, *School of Science, Porto University*, January 2013.

“Which graphical models are difficult to learn?”, *Information Theory and Applications Workshop*, February 2012.

“Learning stochastic differential equations”, *Coordinated Sciences Laboratory, University of Illinois UC*, October 2011.

“Learning graphical models: results and challenges”, *ECE Back To Basics Colloquium, Porto University*, September 2011.

PATENTS AND INVENTIONS

Method and Device For Three-Weight Message-Passing Optimization Scheme Using Splines (Patent pending)

Proximal operators for multi-agent path planning (Patent pending)

Method and Device For Three-Weight Message-Passing Optimization Scheme (Patent pending)

Method and apparatus for contextual linear bandits (Patent pending)

A method for recommending items to a group of users (Patent pending)

Identifying users from their rating patterns (Patent pending)

Parallel-automated document composition (Patent pending)

Automated document composition using clusters (Patent pending)

MENTORING EXPERIENCE

Boston College, Newton, Massachusetts, USA

Post-doctoral advisor

January 2016 – Present

Work with Dr. J.J. Zhu on active learning, their application to biology and computer vision algorithms for evaluation of tracking performance.

Advisor for visiting Ph.D. students

May 2016 – September 2016

Work with Mohammad Rostami, Bikash Joshi and Elaheh Noursadeghi on active learning, accelerated optimization methods and complexity bounds for learning time series.

Post-doctoral advisor

October 2015 – May 2016

Work with Dr. Guilherme França on distributed optimization.

Advisor for visiting Ph.D. students **May 2015 – August 2015**

Worked with AmirReza Oghbaee and Mohammad Rostami on optimal control and active learning using distributed algorithms.

Post-doctoral advisor **September 2014 – January 2015**

Worked with Dr. Ning Hao on distributed optimization and artificial intelligence.

Disney Research Boston, Cambridge, Massachusetts, USA

Intern advisor for Ph.D. student **Summer 2013 and Summer 2014**

Worked with Caglayan Dicle on computer vision (parallel) algorithms for multi-object tracking.

Stanford University, Stanford, California, USA

Teaching assistant **Fall 2007, Summer 2008**

Teaching assistant for graduate course in statistical signal processing (EE278). Grading position for graduate course in stochastic processes (STATS 217/218).

Porto University, Porto, Portugal

Tutor **2001 – 2005**

Tutor for undergraduate courses, including, calculus, physics, signal processing, electronics.

INDUSTRY
EXPERIENCE

Technicolor Labs, Palo Alto, California, USA

Summer intern **2011**

Researched and implemented algorithms for identifying accounts used by multiple users in recommendation systems: Identified the problem as an important step in improving the accuracy of recommendation systems; Developed and compared in real data different algorithms for identifying users in a household from their rating patterns; Contributed for a project concerning recommendation for groups when feedback about their satisfaction is given and groups change over time; Co-Authored two patent application and two papers; Supervisor: stratis.ioannidis@technicolor.com.

Hewlett Packard Labs, Palo Alto, California, USA

Summer intern **2010**

Researched and implemented algorithms for automated document composition based on mixed continuous/discrete Bayesian inference: Provided a clear understanding of the theory and computational tradeoffs underlying various HPLabs automated document composition algorithms; Derived fast parallel algorithms for implementation on GPU/server clusters; Implemented algorithm on GPU achieving a speedup of 2000x over reference MatLab implementation; Briefed and transferred knowledge to remote teams in China; Co-authored two patent applications and two papers; Supervisor: niranjan.damera-venkata@hp.com.

REFERENCES

Contact information provided upon request.