

Jason Pacheco

Machine Learning: Graphical Models, Approximate Inference, Information Planning
Signal Processing: Nonlinear Dynamical Systems, Image/Video Analysis, Motion/Tracking
Applications: Protein Structure, Gene Interaction Discovery, Articulated Object Tracking

Education

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- Doctor of Philosophy**, Brown University Spring 2016
Computer Science
Thesis: *Variational Approximations with Diverse Applications*
Supervisor: Erik Sudderth
- Master of Science**, Brown University Spring 2007
Computer Science
Thesis: *Temporal Decomposition for Online Multisensor Multitarget Tracking*
Supervisor: Meinolf Sellmann
- Bachelor of Science**, University of Massachusetts Dartmouth Spring 2003
Computer Science

Publications

Refereed Publications

- J. Belden, M. M. Mansoor, A. Hellum, S. R. Rahman, A. Meyer, C. Pease, J. Pacheco, S. Koziol and T. T. Truscott. “How vision governs the collective behaviour of dense cycling pelotons.” *Journal of the Royal Society Interface*. 2019.
- J. Pacheco and J. Fisher III. “Variational Information Planning for Sequential Decision Making.” *International Conference on Artificial Intelligence and Statistics*. 2019.
- S. Zheng, J. Pacheco, J. Fisher III. “A Robust Approach to Sequential Information Theoretic Planning.” *International Conference on Machine Learning*. 2018.
- D. Milstein, J. Pacheco, L. Hochberg, J. Simeral, B. Jarosiewicz, E. Sudderth. “Multiscale Semi-Markov Dynamics for Intracortical Brain-Computer Interfaces.” *Advances in Neural Information Processing Systems*. 2017.
- J. Pacheco and E. B. Sudderth. “Proteins, Particles, and Pseudo-Max-Marginals: A Submodular Approach.” *International Conference on Machine Learning*. 2015.
- J. Pacheco, S. Zuffi, M. J. Black and E. B. Sudderth. “Preserving Modes and Messages via Diverse Particle Selection.” *International Conference on Machine Learning*. 2014.
- J. Pacheco and E. B. Sudderth. “Minimization of continuous Bethe approximations: A positive variation.” *Advances in Neural Information Processing Systems*. 2012.
- J. Pacheco and E. Sudderth. “Improved variational inference for tracking in clutter.” *IEEE Statistical Signal Processing*. 2012.

Technical Reports and Working Papers

- R. Chen, J. Pacheco, D. Burch and J. Fisher III. “Bayesian Analysis of Offshore Oil Fields.” *In Preparation: MIT Technical Report*. 2019.

- J. Pacheco, S. Zuffi, M. Black and E. B. Sudderth. “Diverse Particle Max-Product.” *In submission: Journal of Machine Learning Research*. 2019.
- R. Kothapa, J. Pacheco and E. B. Sudderth. “Max-product particle Belief Propagation.” *Brown University Technical Report*. 2011.

Work Experience

University of Arizona, Computer Science <i>Assistant Professor</i>	Tucson, AZ	Aug. 2019 - Present
Massachusetts Institute of Technology <i>Postdoctoral Associate</i>	Cambridge, MA	Dec. 2016 - Aug. 2019
Naval Undersea Warfare Center <i>Research Scientist</i>	Newport, RI	Sep. 2012 - Dec. 2016
Brown University, Computer Science <i>Graduate Research Assistant</i>	Providence, RI	Sep. 2010 - May 2016
Naval Undersea Warfare Center <i>Software Engineer</i>	Newport, RI	Jun. 2003 - Sep. 2012

Research Grants

- Robust MAP Inference for Continuous Graphical Models*
In-House Laboratory Independent Research: Naval Undersea Warfare Center
\$225,000, Principal Investigator, Oct. 2013 to Sep. 2016
- Learning Models of Multimodal Sensors*
In-House Laboratory Applied Research: Naval Undersea Warfare Center
\$100,000, Principal Investigator, Oct. 2016 to Sep. 2017

Awards

Brown University Dept. of Computer Science Dissertation Fellowship	2015
Naval Undersea Warfare Center Fellowship	2014
Naval Undersea Warfare Center Fellowship	2007

Teaching and Advising

University of Arizona	
CSC 665-1: Advanced Topics in Probabilistic Graphical Models	Fall 2019
Brown University	
CSCI 2950-P: Probabilistic Graphical Models (Graduate TA)	Spring 2013
CSCI 2950-P: Applied Bayesian Nonparametrics (Graduate TA)	Fall 2011
CSCI 1950-F: Introduction to Machine Learning (Graduate TA)	Spring 2011

Graduate Supervision

<i>Bayesian Analysis of Offshore Oil Systems</i> Rujian Chen, MIT CSAIL	Current
<i>Computational Methods for Sequential Bayesian Decision Making</i> Sue Zheng, MIT CSAIL	Current

<i>Multiscale Semi-Markov Models for Intracortical Brain-Computer Interfaces</i>	Daniel Milstein, Brown University Dept. of Computer Science	May 2017
<i>Max-Product Particle Belief Propagation</i>	Rajkumar Kothapa, Brown University Dept. of Computer Science	May 2011

Undergraduate Supervision

<i>Protein Structure Prediction from Low-Resolution Electron Density Data using Particle Belief Propagation</i>	Roshan Rao, Brown University Dept. of Computer Science	May 2017
<i>Applications and Extensions of the Diverse Particle Max-Product Algorithm</i>	Samuel Ainsworth, Brown University Dept. of Computer Science	May 2016
<i>Assumed Density Filtering for Fast Tracking of Neural Firing Rates</i>	Daniel Milstein, Brown University Dept. of Computer Science	Dec. 2015

Invited Lectures

<i>Probabilistic Reasoning in Complex Systems: Algorithms and Applications</i>		
MIT, Computer Science and Artificial Intelligence Lab		Feb. 2019
Dartmouth College, School of Engineering		Feb. 2019
Purdue University, Dept. of Computer Science		Mar. 2019
University of Arizona, Dept. of Computer Science		Mar. 2019
University of Pittsburgh, School of Information Science		Apr. 2019
<i>Robust Information Theoretic Planning</i>		
MIT, Consortium for Verification Technology Project Review		Sep. 2017
ExxonMobil Headquarters, Houston TX		Jun. 2017
<i>Diverse Particle Max-Product</i>		
MIT CSAIL, John Fisher III Laboratory		Jun. 2016
McGill University, Kaleem Sidiqqi Laboratory		May. 2016
Naval Undersea Warfare Center, Division Newport RI		Apr. 2016
Brown University, Guest Lecture: Probabilistic Graphical Models		Mar. 2016
Virginia Tech, Dhruv Batra Laboratory		Feb. 2016
Naval Undersea Warfare Center, Division Newport RI		Apr. 2015
International Conf. on Machine Learning		Jul. 2015
International Conf. on Machine Learning		Jul. 2014
Brown University, Division of Applied Mathematics		Apr. 2014
<i>Tutorial: Graphical Models, Variational Inference, and Message Passing</i>		
Naval Undersea Warfare Center, Division Newport RI		Feb. 2012

Professional Service

Department Service

Faculty Recruiting Committee (Member)	U. of Arizona	Fall 2019
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Conference Program Committee

Advances in Neural Information Processing Systems (NIPS)
International Conf. on Machine Learning (ICML)
International Conf. on Artificial Intelligence and Statistics (AISTATS)
Association of Advances in Artificial Intelligence (AAAI)

IEEE International Conf. on Computer Vision (ICCV)

IEEE Conf. on Computer Vision and Pattern Recognition (CVPR)

Journal Reviewer

Journal of Machine Learning Research (JMLR)

IEEE Transactions on Signal Processing

IEEE Transactions on Aerospace Engineering