ericjonas

inverse problems and machine learning for science

about

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programming

Python (numpy)
C++11 (Boost)
VHDL
Matlab, Java,
Javascript

interests

Computational acquisition and understanding of nerual and biomedical signals.
Inverse problems and compressive sensing. Sparse and low-rank signal recovery for microscopy, chemical sensing, and graph analysis. Nonparametric Bayesian modeling, inference in structured models, Markov-chain Monte Carlo techniques, architectures for probabilistic inference, high-throughput data acquisition for neuroscience, incorporation of prior information in underconstrained problems, nonlinear signal processing, point processes and sequence data.

education

2013 **Ph.D.** in Brain And Cognitive Sciences — MIT, Cambridge, MA
Stochastic Architectures for Probabilistic Computation
Advisors: Matthew Wilson and Josh Tenenbaum

2009 **M.Eng.** Electrical Engineering And Computer Science — MIT, Cambridge, MA
Real-time analog acquisition of electrophysiological signals with Soma
Advisor: Matthew Wilson

2005 **B.Sc.** Electrical Engineering and Computer Science — MIT, Cambridge, MA
Focus on low-level systems architecture and digital signal processing

2003 **B.Sc.** Brain and Cognitive Sciences — MIT, Cambridge, MA
Systems level neuroscience, learning and memory

experience

Aug 2014 - Present **UC Berkeley EECS** Berkeley, CA — Postdoc with Ben Recht
Research in applications of scalable compressive sensing, inverse problems, and biomedical signal acquisition. Neural data anlysis. Working with other researchers in optics, biomedical engineering, and clinical medicine.

Dec 2012- April 2014 **Salesforce.com** San Francisco, CA — Chief Predictive Scientist
Lead the scientific and engineering team from Prior Knowledge following the acquisition by Salesforce.com, working with customers, product managers, and engineers to develop a predictive platform.

Aug 2011- Dec 2012 **Prior Knowledge, Inc.** San Francisco, CA — Founder and CEO
Oversaw the development, launch, deployment and scaling of Veritable, the world's first predictive database. Managed a team of six engineers, raised funding, worked with early customers. Designed and implemented core back-end inference engine, TARDIS, and lead team that scaled it to billions of data points.

Sept 2003- Dec 2009 **Wilson Lab, PILM, BCS, MIT** Cambridge, MA — Graduate student
Ph.D. Candidate with successful completion of qualifying examinations. Mixed-signal hardware/software design, experiment design, data analysis for high-throughput neuroscience using tetrode arrays in awake, behaving animals.

publications

papers and preprints

"Could a Neuroscientist understand a Microprocessor? "
Eric Jonas, Konrad Kording
bioarXiv (May 2016). 10.1101/055624

"Discovering Neural Types and Circuits via Connectomics "
Eric Jonas, Konrad Kording
eLife (Apr. 2015). 10.7554/eLife.04250

"3D imaging in volumetric scattering media using phase-space measurements"
Hsiou-Yuan Liu, Eric Jonas, Lei Tian, Jingshan Zhong, Benjamin Recht, Laura Waller
Optics Express 23.11 (June 2015). 10.1364/OE.23.014461

"Building fast Bayesian computing machines out of intentionally stochastic parts"
Eric Jonas, Vikash Mansinghka, Josh Tenenbaum
arXiv (2014). http://arxiv.org/abs/1402.4914

peer-reviewed conferences/proceedings

Kernel Latent Space Models for understanding neural connectomes
Eric Jonas, Srini Turaga
COSYNE 2016, 2016

Scaling Nonparametric Bayesian Inference via Subsample-Annealing
Fritz Obermeyer, Jonathan Glidden, Eric Jonas
AISTATS 2014, 2013

Cross-categorization : A method for discovering multiple overlapping clusterings
Vikash Mansinghka, Eric Jonas, Cap Petschulat, Beau Cronin, Pat Shafto, Josh Tenenbaum
NIPS Workshop of Nonparametric Bayesian Statistics, 2009

Exact and Approximate Sampling by Systematic Stochastic Search
Vikash Mansinghka, Dan Roy, Eric Jonas, Josh Tenenbaum
Proceedings of the 12th International Conference on Artificial Intelligence and Statistics (AISTATS), 2009

patents

Combinational Stochastic Logic
V. K. Mansinghka, E. M. Jonas
US Application No. 12/397,754; Pub. No. US 2009/0228238 A1, March 4, 2009

Stereoscopic Wide Field of View Imaging System
E.F. Prechtl, R.J. Sedwick, E.M. Jonas
US 7982777, July 19, 2011

Configurable Circuitry for Solving Stochastic Problems
E. M. Jonas, V. K. Mansinghka
US Application No. 13/032,054; Pub. No. US 2011/0208676 A1, Feb 22, 2011

research reports

Stochastic Digital Circuits for Probabilistic Inference
Vikash Mansinghka, Eric Jonas, Josh Tenenbaum
Technical Report 2008-069, 2008

Press

2016.08.23	**What Donkey Kong can tell us about how to study the brain**	Science News
2016.06.02	**Can Neuroscience Understand Donkey Kong, Let Alone a Brain?**	The Atlantic
2012.11.23	**Salesforce to predict the future with Prior Knowledge**	Venture Beat
2012.07.02	**Prior Knowledge wants to be your data Oracle**	GigaOM
2012.09.11	**Prior Knolwedge builds a predictive database for developers**	TechCrunch
2013.08.11	**Prior Knowledge becomes Salesforce skunk works project**	TechCrunch

Awards

Sept 2015 **DARPA Rising recipient** Nominated by Matthew Hepburn of the Biological Technology Office

Invited Talks

September 2015 **Smarter Measurement via Computation**
DARPA Rising Session, St. Louis, MO

Jan 2015 **Can a Neuroscientist Fix a Computer? Reverse-engineering man-made computation for big-data neuroscience**
Kavli Futures Symposium: Towards a Taxonomy of Cortical Computations

May 2014 **Discovering structure with Connectomics**
2014 Workshop on Algorithms for Modern Massive Data Sets

Speaking (non-academic)

Nov 2013 **How will Predictive Analytics Change Sales** Dreamforce 2013

July 2013 **Discovering Structure with Latent Variable Models** PyData Boston 2013

Sept 2012 **Prior Knowledge and the Predictive Database** TechCrunch Disrupt 2012

May 2012 **Peter Thiel's Startup School on Deep Thought** CS183 at Stanford