Gonzalo E. Mena

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OBJECTIVE

To conduct fundamental research in Statistical Machine Learning & Artificial Intelligence, and to deploy applications targeted at scientific endeavors.

EDUCATION

Columbia University, New York, NY, USA — 2012-2018
Ph.D. Statistics — January 2018 (expected)

- Advisor: **Liam Paninski**
- **Concentration:** Statistical Machine Learning, Neural Data Analysis, Brain Machine Interfaces, Computational Neuroscience.

M.Phil. Statistics — May 2016
M.A. Statistics, — September 2014

University of Chile, Santiago, Chile — 2005-2011
Mathematical Engineer Certificate — August 2011
B.S., Engineering — July 2010

PROFESSIONAL EXPERIENCE

Google Brain, Cambridge, MA, USA. Host: **Jasper Snoek**. — Jun-Sep 2017
Fundamental research on a new Neural Network that allows to reconstruct objects from pieces.

Center for Mathematical Modeling, University of Chile Santiago, Chile — 2010-2011
Project Engineer, working in problems of the copper mining industry.

AWARDS AND FELLOWSHIPS

COSYNE Presenter Travel Grant	2017
Dean's Fellowship GSAS, Columbia University. Full funding of the Ph.D.	2012
Fulbright Scholarship for PhD Studies in the US.	2011
Outstanding Student (top 5%). University of Chile.	2005-2009
Highest Score, PSU Mathematics (Admission Test for Chilean Universities)	2004
Honorable Mention. XVI Chilean Mathematics Olympiad.	2004
First Place. Mathematics. *Olympiads of Knowledge*. University of Santiago	2004

PUBLICATIONS

Mena, G., Belanger, D., Linderman, S., Snoek, J. Learning Latent Permutations with Gumbel-Sinkhorn Networks. Under review (ICLR 2018). OpenReview . Top 4% in review scores.

Linderman, S.*, **Mena, G.***, Cooper, H., Paninski, L., Cunningham, J. Reparameterizing the Birkhoff Polytope for Variational Permutation Inference. Under review (AISTATS 2018). arXiv.

Mena, G., Belanger, D., Muñoz, G., Snoek, J. Sinkhorn Networks: Using Optimal Transport Techniques to Learn Permutations. NIPS 2017 Workshop in Optimal Transport & Machine Learning. **Selected for Spotlight presentation.**

Mena, G.*, Linderman*, S., Belanger, D., Snoek, J., Paninski, L., Cunningham, J. Toward Bayesian permutation inference for identifying neurons in C. elegans. Under review (NIPS 2017 Workshop on Worm's Neural Information Processing).

Mena, G., Grosberg, L., Hottowy, P., Litke, A., Cunningham, J., Chichilnisky E.J. & Paninski, L. (2017) Electrical Stimulus Artifact Cancellation and Neural Spike Detection on Large Multi-Electrode Arrays . BioRxiv. To appear, PLOS Computational Biology.

Mena, G., Grosberg, L. , Kellison-Linn, F. , Chichilnisky E.J. & Paninski, L. (2015). Large-scale Multi-Electrode Array Spike Sorting Algorithm Introducing Concurrent Recording and Stimulation. NIPS Workshop on Statistical Methods for Understanding Neural Systems.

Mena, G. & Paninski, L. (2014) On Quadrature Methods for Refractory Point Process Likelihoods. Neural Computation, Vol. 26, No. 12, 2790-2797.

Mena, G. (2011) Reflected Stochastic Differential Equations Applied to the Modeling of some Neurobiological Processes Underlying Cognitive Phenomena (Spanish), B.S. Thesis . Academic Repository of University of Chile.

SELECTED CONFERENCE ABSTRACTS AND POSTERS

Madugula, S.*, **Mena, G.***, et al. (2017) Large-scale analysis of patterned epiretinal stimulation for prosthesis design. The Eye and the Chip.

Shah, N., Madugula, S., Grosberg, L., **Mena, G.** et al. (2017). Greedy dictionary-based stimulation for optimization of epiretinal prosthesis. The Eye and the Chip.

Mena, G., Grosberg, L., Madugula, S., Hottowy, P., Litke, A., Cunningham, J., Chichilnisky E.J. & Paninski, L. (2017) Large-scale spike sorting for the analysis of electrical stimulation and a first application. COSYNE

Mena, G., Dartnell, P., Araya, R. (2011). A Computational Mechanism for Learning in Decision Making Through Changes in Cortico-Caudate Synaptic Strength. Chilean Society for Neuroscience Symposium. Santa Cruz, Chile

TEACHING

Columbia University
Instructor: Summer 2015
Introduction to Statistics with Calculus (undergraduate level).
Teaching assistant: 2012-2016
Ph.D. level: Computational Statistics, Neural Data Analysis. M.A. level: Data Mining, Statistical Inference, Probability, Probability and Stat Inference Probability, Stochastic Processes and Applications. Undergrad level: Intro to Statistics (with and without Calculus).
University of Chile 2006-2010
Teaching assistant: 2007-2010
Stochastic Calculus, Markov Processes, Probability and Statistics, Multivariable Calculus, Linear Algebra, Elementary Algebra, Advanced Calculus.
Mathematics Summer School for High School Students 2006

RECENT INVITED TALKS

Optimal transport and Applications to Data Science. Third Summer School in Probability and Stochastic Processes. CMM, University of Chile. January 2018
Toward Bayesian Permutation Inference for Identifying Neurons in C. elegans. Neurotheory Seminar. Columbia University. October 2017
Gumbel-Sinkhorn Networks. Google Brain. Cambridge, MA September 2017
Recent Advances in Artificial Intelligence. CMM, University of Chile. January 2017
Model-based Spike Identification With Electrical Stimulation Artifacts. Symposium on Retinal Prosthesis. Stanford University. August 2016
Gaussian Process for Artifact Cancellation in Neural Recordings. Center for Theoretical Neuroscience, Columbia University. July 2016
How neuroscience can benefit from machine learning?. Machine Learning Seminar, CMM, University of Chile. University of Chile. January 2016
Algorithmic Challenges in Retinal prosthesis. Institute for Complex System of Valparaiso, Chile. January 2016

PROFESSIONAL ACTIVITIES

Reviewer, ICML 2018
Reviewer, NIPS 2016, 2017

Reviewer, AISTATS 2018,
Member of the Institute of Mathematical Statistics

PREVIOUS RESEARCH EXPERIENCE

Stanford University Stanford, CA, USA
Visiting Student 2014-2017

- In close collaboration with **EJ Chichilnisky**'s Lab, developed new ML-based technologies to enhance our ability to interact with the neural tissue through electrical stimulation using large MEA's.

CIAE, University of Chile Santiago, Chile
Research Assistant 2010-2011

- Assisted experimental and data analysis research in studies on the cognitive basis of mathematical proficiency.

University of California, San Diego San Diego, CA,USA
Research Intern Summer 2008

- Collaborated with **Rafael Nuñez** in the *Embodied Cognition Lab*, making statistical analysis for a study about the non-spatial representations of numbers in the mind. Results were published in the journal *Cognition*.

BLOGGING

The Gumbel-Softmax Trick for Inference of Discrete Variables Columbia Advanced Machine Learning Seminar Blog. `https://casmls.github.io` +2000 visits

SKILLS

Languages: Spanish (native), English (fluent), French (elementary)
Programming languages: Python, Matlab, R, Java
Other Computational Skills:Git,LaTeX

Last updated: December 29, 2017