

# Gonzalo E. Mena

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## Current position

PhD Student, Statistics Department, Columbia University

## Areas of specialization

Statistical Machine Learning and Applications • Neural Data Analysis

## Education

2014-2018	PhD. in Statistics, <b>Columbia University</b> Advisor: Liam Paninski.
2012-2014	M.A. Statistics, <b>Columbia University</b>
2007-2011	Mathematical Engineer Certificate, <b>University of Chile</b> .
2005-2007	Bs. Engineering, <b>University of Chile</b> .

## Employment and Research Experience

Summer 2017	Software Engineer (Research) Intern, <b>Google Brain</b> . Cambridge, MA. Host: Jasper Snoek.
2014 - 2017	Visiting Student. <b>Stanford University</b> . E.J. Chichilnisky Lab.
2010 - 2011	Project Engineer, <b>Center for Mathematical Modeling, University of Chile</b>
2010-2011	Research Assistant. <b>CIAE, University of Chile</b>
Summer 2008	Research intern. <b>University of California, San Diego</b> . Host: Rafael Nuñez

## Publications

### PREPRINTS

2017	<b>Mena, G.</b> , Belanger, D., Linderman, S., Snoek, J. Learning Latent Permutations with Gumbel-Sinkhorn Networks. Under review (ICLR 2018). <a href="#">Top 4%</a> of submissions. <a href="#">OpenReview</a> .
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#### CONFERENCE PAPERS

- 2018 Linderman, S.\*, **Mena, G.\***, Cooper, H., Paninski, L., Cunningham, J. Reparameterizing the Birkhoff Polytope for Variational Permutation Inference. AISTATS 2018. [arXiv](#).

#### JOURNAL ARTICLES

- 2017 **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. In press, [PLOS Computational Biology](#)13: e1005842.
- 2014 **Mena, G.** & Paninski, L. (2014) On Quadrature Methods for Refractory Point Process Likelihoods. [Neural Computation](#), Vol. 26, No. 12, 2790-2797.

#### PEER REVIEWED CONFERENCE WORKSHOPS AND ABSTRACTS

- 2017 **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.**
- 2017 **Mena, G.\***, Linderman\*, S., Belanger, D., Snoek, J., Paninski, L., Cunningham, J. Toward Bayesian permutation inference for identifying neurons in C. elegans. NIPS 2017 Workshop on Worm's Neural Information Processing.
- 2017 Madugula, S.\*, **Mena, G.\***, et al. (2017) Large-scale analysis of patterned epiretinal stimulation for prosthesis design. The Eye and the Chip.
- 2017 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
- 2015 **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.

#### THESES

- 2011 **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](#).

#### OTHER CONFERENCE POSTERS

- 2018 Linderman, S.\*, **Mena, G.\***, Cooper, H., Paninski, L., Cunningham, J. Reparameterizing the Birkhoff Polytope for Variational Permutation Inference. BAFI
- 2011 **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
- 2011 Gomez, M., **Mena, G.**, Araya, R., Dartnell, P. (2011) Individual Differences in Inhibitory Control and Fraction Learning. IMBES Conference 2011. San Diego, CA, USA.

## Honors and Fellowships

- 2017 COSYNE Presenter Travel Grant
- 2012 Dean's Fellowship GSAS, Columbia University. Full funding of the Ph.D.
- 2011 Fulbright Scholarship for PhD Studies in the US.

2005-2009	Outstanding Student (top 5%). University of Chile.
2004	Highest Score, PSU Mathematics (admission test for Chilean universities).
2004	Honorable Mention. XVI Chilean Mathematics Olympiad.
2004	First Place. Mathematics. <i>Olympiads of Knowledge</i> . University of Santiago

## Research Talks

2018	<i>Optimal transport and Applications to Data Science</i> . Third Summer School in Probability and Stochastic Processes. CMM, University of Chile.
2017	<i>Toward Bayesian Permutation Inference for Identifying Neurons in C. elegans</i> . Neurotheory Seminar. Columbia University.
2017	<i>Gumbel-Sinkhorn Networks</i> . Google Brain. Cambridge, MA.
2017	<i>Recent Advances in Artificial Intelligence</i> . CMM, University of Chile. Machine Learning Seminar, CMM, University of Chile.
2016	<i>Model-based Spike Identification With Electrical Stimulation Artifacts</i> . Symposium on Retinal Prosthesis. Stanford University.
2016	<i>Gaussian Process for Artifact Cancellation in Neural Recordings</i> . Center for Theoretical Neuroscience, Columbia University.
2016	<i>How Neuroscience Can Benefit From Machine Learning?</i> . Machine Learning Seminar, CMM, University of Chile.
2016	<i>Algorithmic Challenges in Retinal prosthesis</i> . Institute for Complex System of Valparaiso, Chile.
2015	<i>Large-scale Multi-Electrode Array Spike Sorting Algorithm Introducing Concurrent Recording and Stimulation</i> . Computer Science Department, Stanford University.

## Teaching

### INSTRUCTOR

2015	Introduction to Statistics with Calculus (undergraduate level).
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### TEACHING ASSISTANT

2017	Neural Data Analysis (PhD. level).
2017	Computational Statistics (PhD. level).
2016	Probability and Statistic Inference (M.A. level).
2016	Introduction to Statistics (without calculus) (undergrad level). Data Mining (M.A. level).
2015	Introduction to Probability and Statistics (M.A. level).
2015	Data Mining (M.A. level).
2014	Computational Statistics (PhD. level).
2014	Statistical Inference (M.A. level).
2013	Stochastic Processes and Applications (M.A. level).
2013	Probability (M.A. level).
2012	Probability and Statistics (M.A. level).
2010	Stochastic Calculus (M.Sc. level).
2009	Markov Processes (M.Sc. level).
2009	Probability and Statistics (undergrad level).
2008	Linear Algebra (undergrad level).
2008	Multivariate Calculus (undergrad level).
2007	Elementary Algebra (undergrad level).

2007 Elementary and advanced Calculus (undergrad level).  
 2006 Mathematics Summer School for High School Student.

## Service

2018 Reviewer, ICML.  
 2017 Reviewer, AISTATS.  
 2016,2017 Reviewer, NIPS.

## Other

### BLOGGING

2017 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,  $\LaTeX$   
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Last updated: December 29, 2017 •  $\LaTeX$