Gabriel Schamberg

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Education

PhD Electrical Engineering August 2019
Electrical and Computer Engineering Department, University of California, San Diego (UCSD)

MS Electrical Engineering June 2016
Electrical and Computer Engineering Department, UCSD

BS Computer Engineering June 2012
Computer Science and Engineering Department, UCSD

Research

Postdoctoral Fellow October 2019 – Present
Picower Institute for Learning and Memory, Neuroscience Statistics Research Laboratory, MIT

Graduate Student Researcher December 2014 – August 2019
Neural Interaction Lab, UCSD

Undergraduate Student Researcher January 2012 – June 2012
San Diego Supercomputer Center, UCSD

Teaching

Co-Instructor, Statistics for Neuroscience Research (9.073) Spring 2021
Brain and Cognitive Science Department, MIT

Co-Instructor, Topics in Neural Signal Processing (9.272) Spring 2020
Brain and Cognitive Science Department, MIT

Instructor, Fundamentals of Engineering Applications (ENG 10) Summer 2018
Jacobs School of Engineering, UCSD

Instructor, Introduction to Engineering III (ENG 3) Spring 2016
Jacobs School of Engineering, UCSD

Instructor, Introduction to Engineering II (ENG 2) Winter 2015
Jacobs School of Engineering, UCSD

Instructor, Introduction to Engineering I (ENG 1) Fall 2015
Jacobs School of Engineering, UCSD

Industry Experience

Analytics Research Intern June 2017 – September 2017
CoreLogic

Software Developer May 2014 – July 2014
Ziva Corporation

Software Developer October 2012 – April 2014
NKI Engineering

Software Developer (Part-time) June 2011 – December 2011
Teradata

Publications

Journal Publications

- **G. Schamberg**, E. N. Brown, "The Titration Paradox is Simpson's Paradox," *Clinical Pharmacology and Therapeutics*, In Press (Letter to the Editor)

- J. H. Abel*, M. A. Badgeley*, B. Meschede-Krasa, **G. Schamberg**, I. C. Garwood, K. Lecamwasam, S. Chakravarty, D. W. Zhou, M. Keating, P. L. Purdon, and E. N. Brown, "Machine Learning of EEG Spectra Classifies Unconscious States During Propofol-Induced Anesthesia," *PLoS One*, In Press
- **G. Schamberg**, W. Chapman, S. Xie, and T. P. Coleman, "Direct and Indirect Effects: An Information Theoretic Approach," *Entropy*, Volume 22, Issue 8, August 2020
- **G. Schamberg** and T. P. Coleman, "Measuring Sample Path Causal Influences with Relative Entropy," *IEEE Transactions on Information Theory*, Volume 66, Issue 5, October 2019
- A. Allegra, A. Gharibans, **G. Schamberg**, D. Kunkel, and T. P. Coleman, "Bayesian Inverse Methods for Spatiotemporal Characterization of Gastric Electrical Activity from Cutaneous Multi-Electrode Recording," *PLoS One*, Volume 14, Issue 10, October 2019
- **G. Schamberg**, D. Ba, and T. P. Coleman, "A Modularized Efficient Framework for Non-Markov Time Series Estimation," *IEEE Transactions on Signal Processing*, Volume 66, Issue 12, June 2018.

Peer-Reviewed Conference Publications

- W. De Faria, **G. Schamberg**, and E. N. Brown, "Classifying EEG of Propofol-Induced Unconsciousness in the Presence of Burst Suppression," *IEEE MIT Undergraduate Research Technology Conference*, October 2020.
- **G. Schamberg***, M. A. Badgeley*, and E. N. Brown, "Controlling Level of Unconsciousness by Titrating Propofol with Deep Reinforcement Learning," *International Conference on Artificial Intelligence in Medicine*, August 2020 **(Best Paper Award)**.
- **G. Schamberg** and T. P. Coleman, "On the Bias of Directed Information Estimators," *IEEE International Symposium on Information Theory*, July 2019.
- **G. Schamberg** and T. P. Coleman, "A Sample Path Measure of Causal Influence," *IEEE International Symposium on Information Theory*, June 2018.
- **G. Schamberg**, M. Wagner, D. Ba, and T. P. Coleman, "Efficient Low-Rank Spectrotemporal Decomposition using ADMM," *IEEE Statistical Signal Processing Workshop*, June 2016.

Non-Peer Reviewed (Preprints, Workshops, and Invited Papers)

- **G. Schamberg***, P. Venkatesh*, "Partial Information Decomposition via Deficiency for Multivariate Gaussians," *arXiv:2105.00769*, May 2021
- **G. Schamberg***, S. Chakravarty*, T. Baum, and E. N. Brown, "Inferring neural dynamics during burst-suppression using a neurophysiology-inspired switching state-space model," *IEEE Asilomar Conference on Signals, Systems, and Computers*, November 2020.
- **G. Schamberg** and T. P. Coleman, "Quantifying Context-Dependent Causal Influences," *NeurIPS Workshop on Causal Learning*, December 2018.

Thesis

- "Information Theoretic Measures and Estimators of Specific Causal Influences," *University of California, San Diego*, August 2019.

* *denotes equal contribution*

Invited Talks

Royal College of Anaesthetists Winter Symposium	December 2020
Information, Signals, and Systems Seminar, *Harvard*	March 2019
Neuroscience Statistics Research Laboratory Seminar, *MIT*	March 2019
CRISP Lab Seminar, *Harvard*	March 2017

Conference Talks

IEEE Asilomar Conference on Signals, Systems, and Computers	November 2020
International Conference on Artificial Intelligence in Medicine	August 2020
IEEE International Symposium on Information Theory	July 2019
Information Theory and Applications Workshop	February 2019
IEEE International Symposium on Information Theory	July 2018

Grants and Awards

Picower Postdoctoral Fellowship October 2019 – Present
Picower Institute for Learning and Memory

Innovative Research Grant Award July 2018
Kavli Institute for Brain & Mind

Honorable Mention, Graduate Research Fellowship Program April 2015
National Science Foundation

Jacobs Fellowship September 2014 – September 2017
Jacobs School of Engineering, UCSD

Gordon Scholar September 2009
Gordon Center for Engineering Leadership, UCSD

Academic Involvement

Tutorial Co-Organizer, *IEEE International Symposium on Information Theory* July 2021
Guest Editor, *Entropy* Special Issue on "Information Flow in Neural Systems" November 2020
Reviewer, *IEEE Transactions on Neural Networks and Learning Systems* October 2020
Reviewer, *IEEE Transactions on Signal Processing* January, March 2020
Reviewer, *IEEE International Symposium on Information Theory* February 2020, 2021
Reviewer, *IEEE Transactions on Information Theory* December 2019
Reviewer, *Knowledge Based Systems* December 2018, June 2019
Session Co-Chair, *Information Theory and Applications Workshop* February 2017