

Samuel Garrett Thorpe

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Summary

I am a highly motivated self-learner with extensive quantitative modeling experience and formal mathematical foundations, looking to work on challenging problems in interdisciplinary areas of industrial research and/or data science. My work up to this point has focused in cognitive and computational neuroscience, using spectral analyses of EEG/MEG signals and cortical modeling techniques to study spatial attention and motor development in humans. Although this is a specialized area of research, my work in it has allowed me to develop a broadly applicable data processing skill set. I am eager to further develop and acquire new skills by immersing myself in novel data and exciting new technical problems.

Key Skills

- Mastery of Matlab programming for data analysis and visualization. Proficient in Python, especially the scientific Python stack (Numpy, Scipy, Pandas, scikit-learn, matplotlib, etc)
- Excellent signal processing (>10 years experience), including digital filtering, Fourier Analysis, wavelets, SVD, ICA.
- Extensive statistical modeling experience (regression, bootstrapping)
- Experience with machine learning techniques (classification & clustering problems)
- Experience with dynamical systems modeling (coupled differential equations)
- Highly motivated and capable of acquiring new analytical skills
- Engaging written/oral communicator adept at public and in-house presentations

Education

Ph.D. Mathematical Behavioral Science, 2012

Institute for Mathematical Behavioral Sciences, University of California, Irvine

Dissertation: "Dynamic modulation of sensory cortex by top-down spatial attention"

Related course work: Measure theory, stochastic processes, computational partial differential equations, multivariate time series analysis, EEG-based brain computer interfaces, computational neuroscience, vision, functional MRI.

B.S. Mathematics, 2005

University of California, Irvine

Related course work: Probability and statistics, real and complex analysis, Fourier analysis, theory of differential equations, differential geometry, abstract and linear algebra, topology.

B.A. Psychology, 2005

University of California, Irvine

Areas of Concentration: Cortical neuroscience, cognitive modeling

Honors Thesis: "Visual cortex: an investigation of delay effects on coupled nonlinear oscillators"

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Experience

Postdoctoral Research, University of Maryland Child Development Laboratory College Park, MD, USA — 2012-current

- Personally developed extensive Matlab code repository for automated EEG time-series analysis and visualization, for which I taught usage and oversaw application to multiple lab projects.
- Produced first ever published identification and removal of blink waveform artifact from Rhesus Macaque EEG using Independent Components Analysis (ICA).
- Acted as paid consultant for detection and identification of EEG artifact (STAR project, 2013).
- Saved the lab tens of thousands of dollars on proprietary software, by developing code pipeline incorporating open-source tools for cortical source localization of EEG/MEG using head models derived from structural MRI.
- Derived novel methods for applied network analysis and clustering of EEG coherence data to characterize developmental integration of human motor systems.

Graduate Research, UCI Human Neuroscience Laboratory Irvine, CA, USA — 2006-2012

- Used spatial frequency wavenumber methods to reveal the existence of standing and travelling waves in simultaneously recorded EEG/MEG.
- Implemented naive Bayes classifier to predict the external locus of spatial attention based on EEG spectral content.
- Developed methods for classification of imagined sentences using EEG time-frequency characteristics.
- Derived and implemented cortical population models for interpretation and prediction of EEG data.
- Used wavelets and ICA to identify effects of spatial attention on EEG/MEG signals, and modeled interactions of these signals with visual processing.

Recent Awards

Data Incubator Scholar, Summer 2015 (deferred)

After multiple rounds of evaluation including technical challenges and interviews, I earned entry into the program by placing in the top 5 percent of a pool of roughly 1,000 advanced degree applicants, but have currently deferred participation while job searching.

Publications

Coauthored 10 peer reviewed publications in academic journals (4 first author), with an additional 2 currently under review, and 3 more in advanced stages of preparation. Presented original research at numerous academic conferences, including meetings of the Society for Neuroscience, Cognitive Neuroscience Society, and International Society for Bioelectromagnetism. Full list of publications and electronic copies of selected works can be accessed online at: http://bit.ly/ST_publications

References

Available upon request.