

Daniel Breen

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🌐 <http://danielbreen.net/projects/>

Physics PhD with focus on data assimilation and statistical analysis of estimated conductance models of neurons. Demonstrated ability to produce intellectual assets from real world data, 2+ years experience and proficiency using python in dissertation research, and experience in core collaborative roles.

Experience

UC San Diego

Graduate Research Assistant

La Jolla, CA

August 2014– 2017

- Developed and applied a variational approach to data assimilation to estimate conductance models of neurons validated by accurately predicting system time evolution.
- Addressed model identifiability issue in conductance models of neurons by identifying, visualizing statistical patterns in parameters, features of ensembles of estimated models.
- Engineered features using estimated neuron models of 21 unlabeled current clamp data sets, used extra trees and random forest variable importance to identify features differing between Alzheimer's diseased and healthy cells, and identified model mechanisms underlying these features.
- Core roles in two collaborations with experimentalists. One collaboration resulted in a conference paper and poster at bioCAS 2016, posters at SfN and an MBI workshop. From the other, a paper is in progress. Preprint and python notebook available at my website.
- 2+ years experience with Python, basic familiarity writing and editing C++, CUDA, R, and SQL.

Education

UC San Diego

○ *PhD in Physics, GPA:3.6*

La Jolla, CA

2011–2017

UC San Diego

○ *MS in Physics, GPA:3.6*

La Jolla, CA

2011–2013

New Mexico Tech

○ *BS in Physics*

Socorro, NM

2007–2011

Programming Languages

- **Proficient:** Python
- **Basic:** R, SQL, Git, Command Line, C/C++, CUDA

Accomplishments

- Three publications plus two preprints.