

Daniel Breen

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🌐 <http://danielbreen.net/projects/>

Physics PhD with focus on optimization, modeling, and data analysis. Analyzed real world neural system data obtained from collaborators. Applied parameter estimation techniques. 2+ years experience and proficiency using python and in core collaborative roles with other research groups.

Experience

UC San Diego

Graduate Research Assistant

La Jolla, CA

August 2014– 2017

- Scraped recipes from foodnetwork.com, discovered ingredients characterizing ethnicity of cuisines using wordclouds, lda topic modeling, and deployed app online using flask and heroku.
- Developed a two step procedure characterizing transistor mismatch to establish a mapping between configurable and true parameter values, leading to emulation of a biological neuron on neuromorphic silicon VLSI chip.
- Developed and applied methods of optimal estimation to characterize input-output relationship of neurons from patch-clamp data. Balanced competing tradeoffs between incorporating biophysical model mechanisms and complexity and characterized optimal patch-clamp protocols.
- Developed a systematic method to discover low dimensional feature spaces separating strains of neurons and underlying biophysical mechanisms using a combined optimal estimation and data mining approach. Discovered a low dimensional feature space separating Alzheimer's diseased and healthy neurons consistent with the Alzheimer's literature, and suggested underlying model mechanisms.
- Core roles in two collaborations with experimentalists. One collaboration resulted in a conference paper and poster at bioCAS 2016, invitation to publish in TBioCAS (only 1% from bioCAS are invited), and posters at SfN and an MBI workshop. From the other, a paper is in progress. Python 'scratch' notebook available at my website.
- 2+ years experience with Python, basic knowledge of 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, familiarity editing C/C++, CUDA