Brendan Chambers

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Creative data scientist. Expert in mapping network dynamics. Comp Neuro PhD. Verbal & visual communicator.

EDUCATION

PhD University of Chicago, Committee on Computational Neuroscience 2016
- Motif analysis and temporal patterns in a neural communication network

BA Oberlin College, Department of Computer Science 2011

RESEARCH EXPERIENCE

University of Chicago Postdoctoral Fellow 2017
- Transferred machine learning strategies to develop better analysis & simulation tools

University of Chicago PhD Candidate 2011 - 2016
- Discovered emergent statistics of a complex communication network
- Supervised & mentored two undergraduates, now placed into research jobs
- Identified candidate causal links in noisy neural communication networks
- Refined a custom signal-acquisition pipeline & developed data quality tests
- Created simulations of balanced spiking networks to complement real data

Oberlin College Honors Scholar 2010
- Developed attention-steered deep RBM for analyzing distorted words

Rockwell Collins Engineering Summer intern 2009
- Supported virtual sensing project & documented C++ code

SELECTED PROJECTS

Quantifying racial inequity in a statewide alleged gang-member database 2018
- Compared database composition to state population demographics based on census data
- African-American individuals were overrepresented four-fold compared to racial equity
- New entries to the database were even more skewed towards racial inequity

Identifying voting blocs in legislative bodies (Chicago City Council, State Legislature of Iowa) 2018
- Developed custom web-scrapers to obtain voting data
- Analyzed community structure in voting records

Character-level text generation of political speech with RNNs via Keras 2018
- Employed LSTM model with BPTT and presented advantages of Hessian-Free Optimization

Investigating racialized sentiment in Twitter statuses 2017
- Built databases of tweets using multiple methods: Streaming API, REST API, web-scraping
- Identified linguistic clusters within tweets about Congressman John Lewis

Solving non-differentiable objective functions with stochastic optimization
- Parameter tuning of spiking neural network models (Firefly algorithm, Particle Swarm) 2017
- Decoding substitution cyphers, finding short paths for TSP (Genetic algorithms) 2010

SKILLS

Programming languages (years)
- Python (4) JavaScript/ES6 (1) Scheme (1) Java (4) Matlab (6)

Data analysis
- Motif counting, community detection, dimensionality reduction, inference of reliable interactions, designing statistical nulls, stochastic optimization, hierarchical clustering, machine learning

Visualization and information design (years)
- Matplotlib (4) Adobe Illustrator (5) Inkscape (1) Gephi (3) NetworkX (4) D3.js (1)
- Over 40 panels of scientific visualizations published

Communication
- Published three first-author publications in peer-reviewed journals
- Presented complex computational research to diverse audiences
- Symposium speaker at interdisciplinary conference for network science NetSci 2017
- Recognized among 50 Most-Downloaded Articles, PLOS Computational Biology 2017