

Brendan Chambers

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Creative data scientist. Former computational neuroscientist. 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 neural communication networks using statistical nulls	
	· 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 code	

SELECTED PROJECTS

Quantitatively dissected a computational biology journal using natural language processing	2018
· Developed custom web-scraper to obtain the complete history of PLOS Computational Biology	
· Pre-processed text and built an SQL database of clean text using SQLite	
· Learned semantically rich representations of abstracts by training word2vec encodings	
· Identified topic structure using dimensionality reduction (PCA, U-MAP) & clustering (HDBSCAN)	
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	
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 (Evolutionary algorithms)	2010

SKILLS

Programming languages (years)

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

Data analysis

- Social network analysis, deep neural networks, hypothesis testing, computational modeling

Communicating results

- Three first-author articles in peer-reviewed journals
- Over 40 panels of scientific visualizations published
- Public speaking experience presenting complex computational research to diverse audiences
- Selected symposium speaker at interdisciplinary conference for network science NetSci 2017
- Recognized among 50 Most-Downloaded Articles, PLOS Computational Biology 2017