Samuel Brotherton

CONTACT INFORMATION

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EDUCATION

Harvard University, Cambridge, MA

B.A., Mathematics and East Asian Studies **Sep 2008 – May 2012**

Received highest honors for senior thesis analyzing over 200,000 Chinese blog posts, algorithmically detecting mutations in the Chinese language in response to censorship. Completed coursework in abstract algebra, Galois theory, topology, real and complex analysis, probability theory, and linguistics.

PROFESSIONAL EXPERIENCE

Cairn Labs, Salt Lake City, UT

President and Founder **Sep 2011 – present**

Full stack software development for clients, with a focus on building server-side applications that integrate state-of-the-art NLP and machine learning. I manage a remote team including full time frontend and machine learning engineers, while also developing the core backend code and system architecture.

- A deep-learning based conversational UI framework to power will.i.am's new wireless earphones (`https://iamplus.com/buttons/`) and other applications. Backed by Python, Tensorflow, and other technologies. Supports multiple languages, extensible dialogue flows, and includes a type system that integrates with a custom knowledge base.
- A web-based business intelligence tool allowing decision-makers within the pharmaceutical industry to optimize total revenue of product launches across many countries. Backed by Elixir/Phoenix, PostgreSQL, and React.js; includes a fast, concurrent traveling salesman problem solver.
- An advertising server to display appropriate concert ticket offers to users, based on user-level and page-level contextual targeting. Backed by Elixir/Phoenix, Python, PostGIS, and React.js.

Google, Venice, CA

Software Engineer III **Jun 2014 – Mar 2016**

Worked on a small team using natural language processing and other machine learning techniques to improve advertisement quality. Led a 20% project related to mining semantic information from web data, which was adopted by several teams across different product areas. Built a named entity recognition system in C++ and a link detection algorithm that runs on very large graphs; contributed to a topic model for clustering semantic entities.

Whisper, Venice, CA

Software Engineer and Data Scientist **Mar 2013 – Apr 2014**

Worked as sole data scientist at a rapidly expanding social media startup seeing upwards of three billion monthly pageviews. Designed and built an NLP service to extract topics and tags from posts, predict image searchterms from unstructured text, and target content to users. Implemented a new geographic search system using PostGIS that decreased search time by 90%. Worked closely with the front and backend development teams, writing production code in Erlang and Python.

General Assembly, Santa Monica, CA

Expert in Residence **Feb 2014 – May 2014**

Helped teach an introduction to data science class to a group of 15 adult students. The class was based in Python, and included material on ETL techniques, regression and clustering, ensemble learning, natural language processing, and dimensionality reduction techniques.

SELECTED PUBLICATIONS

Stephens, M., Brotherton, S., Dunning, S., Emerson, L., Gilbertson, D., McClellan, A., McClellan, W. & Gitlin, M. (in press). "Geographic Disparities in Patient Travel for Dialysis in the United States", *The Journal of Rural Health.*

PROGRAMMING EXPERIENCE

Languages: Python, C++, C#, F#, Erlang, Elixir, Mathematica, Haskell, Bash, C, LaTeX
Data Technology: Cassandra, Redis, PostgreSQL, ElasticSearch/Lucene, MySQL, MongoDB