Samuel Brotherton

CONTACT
INFORMATION

Phone: (801) 927-0219
Email: sbrother@gmail.com

LinkedIn: `https://www.linkedin.com/in/sbrother`
Address: 7771 Buckboard Drive, Park City, UT 84098

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, Los Angeles, CA / Portland, OR / Park City, UT

Founder & Principal   **Jan 2016 – Feb 2021, Jun 2025 – Present**

Founded a successful boutique consultancy to design and build software for clients, with a focus on applications that integrate state-of-the-art AI and machine learning. Managed a team of 2-18 depending on clients' needs. Most projects involve a multi-year timespan including the sales, design, and implementation phases, followed by eventual transition to in-house resources. Our clients have cumulatively raised over $500M of venture funding using our prototyping and fractional CTO services. A small selection of notable projects includes:

- **i.am+**: Led a team of ~20 developers (a mix of in-house in Los Angeles and outsourced resources in India and Singapore) building a deep learning based conversational UI framework to power will.i.am's wireless earphones and other applications. Backed by Tensorflow, Prolog, and other technologies. Supported multiple languages, extensible dialogue flows, and a custom knowledge base. We eventually licensed the software to Deutsche Telecom, where it powered the Tier 1 Customer Service chatbot in Germany. See `https://goo.gl/iMvVTt`.

- **Authentic Artists**: Led a remote engineering team to build AI-powered audiovisual experiences, including a cloud deep learning server for song generation, a C++ constraint/transformation library for imposing additional musical style on its output, and an automated Max/Ableton session for audio generation. Coordinated with creative and executive teams to balance engineering and IP development with artistic and business goals. See `https://open.spotify.com/album/4ws0VXLBCNhk7tL033xfD5` for examples.

- **Live Circle**: Served as fractional CTO at a Healthcare AI startup over the course of seven years. Managed in-house and contract resources to build a voice-first care management platform to connect patients, caregivers, and clinical staff. Authored several patents and journal articles; see SELECTED PUBLICATIONS for examples.

- **Blue Cross Blue Shield**: Designed and delivered a highly available, HIPAA-compliant machine learning inference server used to predict asthma risk in real time from claims records.

Reddit, San Francisco, CA / Park City, UT (Remote)

Software Engineer, Machine Learning   **Mar 2024 – Jun 2025**

Joined the Ads Engineering team shortly before IPO as a Machine Learning Engineer. Rolled out a new platform for optimizing ad group budget within the bidding and pacing team, using Scala and Akka Streaming. Designed and implemented a prototype Ad Targeting AI tool (using an agentic LLM backend) to help advertisers and AEs quickly build optimal campaigns. Led development of several new data driven recommendation modules to push advertisers toward higher and more effective spend.

Nextdoor, San Francisco, CA / Park City, UT (Remote)

Software Engineer   **Jan 2023 – Mar 2024**

Tech lead on a team building a next generation advertisement platform from scratch while gradually migrating Nextdoor's existing ~$250M of revenue off of a legacy platform powered by Google Ads Manager. Extensive cloud infrastructure development to introduce, maintain, and monitor streaming and batch data pipelines using Apache Beam in Kotlin, Flink, Kafka, and TimescaleDB on Kubernetes/AWS.

Google, Los Angeles, CA / Park City, UT (Remote)

Software Engineer   **Jun 2014 – Mar 2016, Feb 2021 – Jan 2023**

Two stints as a software engineer within Google Display Ads:

- Early career, I 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.

- Boomeranged five years later under Google's COVID-era remote work policy, joining as a software engineer on an infrastructure team within Ads Privacy and Security using natural language processing and machine learning to prevent policy-violating ad impressions. Our systems handled 2M+ queries per second and combined modern deep learning techniques with multi-tier human evaluation pipelines. Additionally, I had a 20% role building remote sensing infrastructure and machine learning models for a stealth climate "startup" within Google.

Whisper, Venice, CA

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

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.

SELECTED PUBLICATIONS

Brotherton, T., Brotherton, S., Ashworth, H., Kadambi, A., Ebrahim, H. and Ebrahim, S., 2022. Development of an Offline, Open-Source, Electronic Health Record System for Refugee Care. *Frontiers in Digital Health*, 4.

Demiris, G., Oliver, D.P., Washington, K.T., Chadwick, C., Voigt, J.D., Brotherton, S. and Naylor, M.D., 2022. Examining spoken words and acoustic features of therapy sessions to understand family caregivers' anxiety and quality of life. *International Journal of Medical Informatics*, 160, p.104716.

Demiris, G., Corey Magan, K.L., Parker Oliver, D., Washington, K.T., Chadwick, C., Voigt, J.D., Brotherton, S. and Naylor, M.D., 2020. Spoken words as biomarkers: using machine learning to gain insight into communication as a predictor of anxiety. *Journal of the American Medical Informatics Association*, 27(6), pp.929-933.

Stephens, M., Bensink, M., Brotherton, S., Chandler, D., Garcia, J. and Hollenbeak, C., 2016. Geographic Access to Oncology Services in the United States (US): Travel Disparities May Affect Granulocyte-Colony Stimulating Factor (G-CSF) Administration. *Blood*, 128(22), p.5905.

Stephens, M., Brotherton, S., Dunning, S., Emerson, L., Gilbertson, D., Harrison, D.J., Kochevar, J., McClellan, A., McClellan, W., Wan, S. and Gitlin, M., 2011. The End-stage Renal Disease (ESRD) Prospective Payment System (PPS) and Access to Care: Incremental Distance Traveled by Displaced Patients.

PROGRAMMING EXPERIENCE

Languages: Python, Kotlin, C++, Erlang, Elixir, Scala, Golang, Mathematica, C#, F#, Bash, C, LaTeX
Server Technology: Kubernetes, Docker, GCP, AWS, Azure, Cassandra, Redis, PostgreSQL, ElasticSearch, Apache Beam, Apache Flink, TimescaleDB, Akka Streaming, Helm, Terraform, Neo4J, Dagster