BRIAN HIE

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EDUCATION

Massachusetts Institute of Technology, Cambridge, MA

Electrical Engineering and Computer Science, Ph.D. (expected)   2017-Present

Electrical Engineering and Computer Science, M.S.

- GPA: 4.9/5.0; Areas of concentration: Algorithms, computational biology, machine learning, statistics.

Stanford University, Palo Alto, CA

Computer Science, B.S. with Honors and Distinction   2012-2016

Minor in English Literature

- GPA: 3.9/4.0; Areas of concentration: Computational biology, distributed systems, machine learning.

RESEARCH AND WORK EXPERIENCE

Massachusetts Institute of Technology, Cambridge, MA

Computer Science and Artificial Intelligence Laboratory (CSAIL)   2017-Present

- Neural language modeling of viral evolution (https://github.com/brianhie/viral-mutation).
- Bayesian machine learning for biological discovery and design under uncertainty (https://github.com/brianhie/uncertainty).
- Insightful and efficient geometric algorithms for single-cell biology (https://github.com/brianhie/scanorama and https://github.com/brianhie/geosketch).
- Cryptographically secure neural network training (https://github.com/brianhie/secure-dti).

Google LLC, Mountain View, CA

Artificial Intelligence/Machine Learning Resident, X – The Moonshot Factory   2019

- Machine learning for early-pipeline moonshots.

Illumina, Inc., San Diego, CA

Machine Learning Intern, Bioinformatics   2018

- Statistical signal processing for genomics-based health monitoring.

Salesforce.com, Inc., San Francisco, CA

Software Engineer, Cloud Infrastructure   2016-2017

- Robust performance monitoring of globally distributed core application infrastructure.

Stanford University, Palo Alto, CA

Hunter Fraser Laboratory, Biology   2013-2016

- Statistics and machine learning for computational genomics, including fundamental problems involving transcription factor binding, chromatin accessibility, and circular RNA structure.

Stanford University, Palo Alto, CA

Shakeosphere Project, Digital Humanities   2016

- Graph-theoretic analysis of the social network of early modern authors and publishers.

Microsoft Corporation, Redmond, WA

Software Engineering Intern, Azure Compute and Microsoft Research   2015

- Distributed scheduling algorithms and their impact on data center utilization and availability.

Synaptics, Inc., San Jose, CA

Systems Architecture/Algorithms Intern   2014

- Algorithm design and implementation for embedded touchscreen firmware.

PUBLICATIONS

B. Hie*, J. Peters*, S. Nyquist*, A. Shalek, B. Berger, and B. Bryson. (*Equal contribution.)

"Computational methods for single-cell RNA sequencing."

Annual Review of Biomedical Data Science, 3:1.   2020

B. Hie*, H. Cho*, B. DeMeo, B. Bryson, and B. Berger. (*Equal contribution.)

"Geometric sketching of single-cell data preserves transcriptional structure."

Cell Systems, 8:6. Also appeared at RECOMB 2019.   2019

B. Hie, B. Bryson, and B. Berger.

"Efficient integration of heterogeneous single-cell transcriptomes using Scanorama."

Nature Biotechnology, 37:6.   2019

A.K. Tehranchi, **B. Hie**, M. Dacre, I.M. Kaplow, K.P. Pettie, P.A. Combs, and H.B. Fraser.

"Fine-mapping cis-regulatory variants in diverse human populations."

eLife, 8:e39595.   2019

B. Hie*, H. Cho*, and B. Berger. (*Equal contribution.)

"Realizing private and practical pharmacological collaboration."

Science, 362:6417.   2018

A.K. Tehranchi, M. Myrthil, T. Martin, **B. Hie**, D. Golan, and H.B. Fraser.

"Pooled ChIP-seq links variation in transcription factor binding to complex disease risk."

Cell, 165:3.   2016

PREPRINTS

B. Hie, B. Bryson, and B. Berger.

"Learning with uncertainty for biological discovery and design."

bioRxiv, DOI: 10.1101/2020.08.11.247072.   2020

B. Hie, E. Zhong, B. Berger, and B. Bryson.

"Learning the language of viral evolution and escape."

bioRxiv, DOI: 10.1101/2020.07.08.193946.   2020

B. Hie, H. Cho, B. Bryson, and B. Berger.

"Coexpression enables multi-study cellular trajectories of development and disease."

bioRxiv, DOI: 10.1101/719088.   2020

PATENTS

B. Hie, B. Berger, and H. Cho.

"Realizing private and practical pharmacological collaboration."

US Patent App. 16/235,606.   2019

GRANTS AND FELLOWSHIPS

Department of Defense (DoD) National Defense Science and Engineering Graduate (NDSEG) Fellowship Program

Total Funding: $158,400 (direct costs)   2018-2021

AWARDS

RECOMB/National Science Foundation Travel Fellowship Award	2019
Hoefer Prize for Writing in the Major, Nominated, *Stanford University*	2016
Tau Beta Pi Engineering Honors Society	2015-Present
Lunsford Award for Oral Presentation, Nominated, *Stanford University*	2014
Boothe Prize for Excellence in Writing, Honorable Mention, *Stanford University*	2013
President's Award for Academic Achievement, *Stanford University*	2013
National Merit Scholarship Finalist	2012

TEACHING

Massachusetts Institute of Technology, Cambridge, MA

Teaching Assistant, Algorithms for Inference (6.438)   2019

Graduate-level course on statistical inference with probabilistic graphical models. Responsible for preparing exams/assignments, leading discussion sections, and holding office hours.

ACADEMIC SERVICE

Ad Hoc Peer Review

Cell, Cell Systems, GigaScience, Nature Biotechnology, PLoS Computational Biology