

**Scott L. Fleming**  
scottfleming.github.io

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- EDUCATION**
- Stanford University**, Stanford CA  
M.S. Computer Science, Specialization in Artificial Intelligence (Expected 2021).  
Ph.D. Biomedical Informatics (Expected 2023).  
Advisors: Nigam Shah, Emma Brunskill
- Stanford University**, Stanford CA  
B.S. Mathematical and Computational Science  
with Departmental Honors (Highest) and University Distinction (Highest), 2017.
- EXPERIENCE**
- Graduate Student Researcher**, Stanford University **Spring 2019 - Present**  
Developed methodology at the intersection of machine learning and health care as a member of both the Stanford AI for Human Impact Lab and Shah Lab. Projects include weak supervision for annotating medical text, reinforcement learning for optimizing treatment plans in the ICU, and representation learning for multidimensional stochastic models. Supervised by Dr. Emma Brunskill and Dr. Nigam Shah.
- Associate Director of AI for Mental Health**, CPMHW **Fall 2018 - Present**  
Coordinated interdisciplinary collaborations and advised student research as the Associate Director of AI for Mental Health in the Stanford Center for Precision Mental Health and Wellness (CPMHW).
- Graduate Student Researcher**, Stanford University **Winter 2019**  
Used techniques from natural language processing and deep learning to forecast treatment trajectories of patients with depression, based on transcriptions of their outpatient talk therapy sessions. Supervised by Dr. Adam Miner and Dr. Nigam Shah.
- Teaching Assistant**, Stanford University **Winter 2019**  
Assisted in curriculum development, course administration, and teaching for “CS 270: Modeling Biomedical Systems: Ontology, Terminology, Problem Solving”.
- Graduate Student Researcher**, Stanford Medicine **Summer 2018**  
Designed a rater-adaptive machine learning method for crowdsourced annotations that enables rapid and accurate diagnosis of autism spectrum disorder online. Supervised by Dr. Dennis Wall.
- Graduate Student Researcher**, Stanford Medicine **Spring 2017 - Present**  
Developed machine learning pipelines in Python and R to analyze functional magnetic resonance imaging (fMRI) data and discover patterns of brain activity that contribute to anxiety and depression. Supervised by Dr. Leanne Williams.
- Teaching Assistant**, Stanford Biomedical Informatics **Winter 2017**  
Assisted in the coordination of “Biomedical Informatics 208: Clinical Informatics Literature Review Seminar”. Presented on clinical decision support systems to a group of clinicians and professional informaticists.

## JOURNAL ARTICLES

Qandeel Tariq\*, **Scott Fleming\***, Jessey Schwartz, Kaitlyn Dunlap, Conor Corbin, Peter Washington, Haik Kalantarian, Naila Khan, Gary Darmstadt, Dennis Wall. Detecting Developmental Delay and Autism Through Machine Learning Models Using Home Videos of Bangladeshi Children: Development and Validation Study. *Journal of Medical Internet Research*, 2019.

Kevin Thomas, Lukasz Kidzinski, Eni Halilaj, **Scott Fleming**, Guhan Venkataraman, Edwin Oei, Garry Gold, Scott Delp. Automated Classification of Knee X-rays Using Deep Neural Networks Outperforms Radiologist. To appear in *Radiology: Artificial Intelligence*, 2019.

Leonardo Tozzi, **Scott Fleming**, Zachary Taylor, Cooper Raterink, Leanne Williams. Short-term test-retest reliability of the human intrinsic functional connectome. Under review at *Human Brain Mapping*, 2019.

Adam Miner\*, Albert Haque\*, Jason Fries, **Scott Fleming**, Denise Wilfley, Terence Wilson, Arnold Milstein, Dan Jurafsky, Bruce Arnow, Stewart Agras, Li Fei-Fei, Nigam Shah. Assessing the Accuracy of Automatic Speech Recognition for Psychotherapy. Under review at *npj Digital Medicine*, 2019.

Adina Fischer\*, Bailey Holt-Gosselin\*, **Scott Fleming**, Laura Hack, Tali Ball, Alan Schatzberg, Leanne Williams. Functional connectivity of reward circuitry is a core mechanistic biomarker of treatment response and quality of life in depression. Under review at *American Journal of Psychiatry*, 2019.

## PEER- REVIEWED WORKSHOP PAPERS

**Scott Fleming**, Kuhan Jeyapragasan, Tony Duan, Daisy Ding, Saurabh Gombar, Nigam Shah, Emma Brunskill. Missingness as Stability: Understanding the Structure of Missingness in Longitudinal EHR data and its Impact on Reinforcement Learning in Healthcare. *NeurIPS ML for Health (ML4H) Workshop*, 2019.

## PRESENTATIONS / POSTERS

Daisy Ding\*, Tony Duan\*, **Scott Fleming\***, Saurabh Gombar, Kenneth Jung, Nigam Shah (September, 2019). Anti-Xa or aPTT? Using Off-Policy Reinforcement Learning to understand the implications of optimizing for one assay over another while titrating heparin dosages in the ICU. **Spotlight Oral Presentation (top 2 submissions** in topic, AI to Improve step-by-step clinical pathways used to apply treatments). *Frontiers of AI-Assisted Care Scientific Symposium*.

**Scott Fleming\***, Shaimaa Bakr\*, Nandita Bhaskhar\*, Daniel Rubin, Leanne Williams (2019, June). Characterizing a New Taxonomy of Mental Disorders from Natural Language on Reddit, a Social Media Platform. *Stanford Psychiatry Grand Grounds*.

Nandita Bhaskhar, **Scott Fleming**, Imon Bannerjee, Leanne Williams, Rebecca Bernert, Daniel Rubin (2019, May). Advancing Suicide Risk Detection: Establishing Digital Phenotypes using Artificial Intelligence. Poster, *Big Data in Precision Health Conference*.

Leonardo Tozzi, **Scott Fleming**, Cooper Raterink, Zachary Taylor, Leanne Williams (2019, June). Counts of Small Subgraphs Within the Resting Functional Connectome are Parsimonious, Stable and Individualized Features in Healthy as Well as Disordered Mood. Poster, *Society of Biological Psychiatry*. Poster, *Organization of Human Brain Mapping*. Abstract Published in *Biological Psychiatry*, June 2019.

Yosef Berlow, Katherine Grizansio, **Scott Fleming**, Abdullah Ahmed, Emily Aiken,

Linda Carpenter, Noah Philip (2018, December). Symptom Profile Subtypes Predict Treatment Response to 5 Hz rTMS in MDD and Co-Morbid PTSD. Poster, *American College of Neuropsychopharmacology (ACNP) 57<sup>th</sup> Annual Meeting*.

**Scott Fleming\***, Qandeel Tariq\*, Michael Du, Kaiti Dunlap, Jessey Schwartz, Naila Khan, Gary Darmstadt, Dennis Wall (2018, November). An Ensemble Learning Method for Early Detection of Autism and Other Developmental Delays using Crowdsourced Video Annotations. **Spotlight Oral (top 20% of submissions)** at the *Maternal and Child Health Research Institute Symposium*. Poster, **3rd place for most exciting application**, at the *Biomedical Informatics Retreat*.

**Scott Fleming**, John Leikauf, Matthew Sacchet, Russell Poldrack (2018, May). A Data-Driven Characterization of Neuropsychiatric Disorders using Measures of Attention, Working Memory, and Response Inhibition. Poster, *Big Data in Precision Health Conference*.

## SELECTED HONORS

**National Defense Science and Engineering Graduate Fellowship** (2019)  
Awarded to top 200 science and engineering doctoral students across the country.

**Stanford Graduate Fellowship, Stanford University, Stanford CA** (2018)  
Awarded to top 100 incoming Stanford doctoral students in science and engineering.

**University Distinction, Stanford University, Stanford CA** (2017)  
Awarded to top 15% of graduating class based on cumulative grade point averages.

**Phi Beta Kappa, Stanford University, Stanford CA** (2017)  
For excellence and breadth of undergraduate scholarly accomplishments. Awarded to top 10% of the graduating class, with additional breadth of study requirements.

**Departmental Honors, Stanford University, Stanford CA** (2017)  
For intensive research and coursework beyond the major requirements.

**Bio-X Undergraduate Summer Research Program, Stanford CA** (2016)  
Competitive research grant awarded to top research proposals. Included three months of intensive study and research with select Stanford University faculty.

**Deans List, College of Life Sciences, BYU, Provo UT** (2015)  
Awarded to top 5% of the college.

**Garth L. Lee Undergraduate Teaching Award, BYU, Provo UT** (2015)  
Awarded for excellent instructional work as an undergraduate teaching assistant.

## RELEVANT COURSEWORK

CS 230: Deep Learning  
CS 224N: Natural Language Processing with Deep Learning  
CS 234: Reinforcement Learning  
CS 221: Artificial Intelligence: Principles and Techniques  
CS 229: Machine Learning  
CS 238: Decision Making under Uncertainty  
CS 228: Probabilistic Graphical Models: Principles and Techniques  
CS 224W: Machine Learning with Graphs  
CS 231N: Convolutional Neural Networks for Visual Recognition  
CS 236: Deep Generative Models  
CS 161: Design and Analysis of Algorithms

STATS 315B: Modern Applied Statistics: Data Mining  
STATS 202: Data Mining and Analysis  
STATS 200: Introduction to Statistical Inference  
EE 263: Introduction to Linear Dynamical Systems  
BIOMEDIN 215: Data Driven Medicine  
BIOMEDIN 219: Mathematical Models and Medical Decisions  
MATH 114: Introduction to Scientific Computing  
MATH 104: Applied Matrix Theory  
APPPHYS 293: Theoretical Neuroscience  
MS&E 221: Stochastic Modeling

**VOLUNTEER  
EXPERIENCES**

**NeurIPS ML4H Workshop** **2018-2019**  
Program Committee Member. Peer reviewed submissions for NeurIPS Machine Learning for Health workshop.

**Church of Jesus Christ of Latter-Day Saints, Recife, Brazil** **2012 - 2014**  
Full-time missionary and volunteer representative of church. Taught lessons in Portuguese designed to strengthen families and communities. Led the coordination and planning of quarterly training events for over 200 missionaries, including transport logistics and accommodations planning. Collected and analyzed organizational data; reported statistics to leadership. Prepared and gave regular trainings to hundreds of other missionaries. Organized and taught free English language classes and carried out community service projects.

**Park City Volunteer Ski Patrol, Park City, UT** **2012**  
Volunteer Ski Patroller. Responded to mountain emergencies. Provided emergency response intervention and facilitated patient transport. Volunteered 144 hours total.

**Santa Clara Valley Medical Center, Santa Clara, CA** **2010**  
Emergency Room Volunteer. Assisted doctors and nurses in the Emergency Department. Volunteered 45 hours total

**The Guatemalan Language Project, Boca Costa, Guatemala** **2009**  
Community Advocate. Coordinated, performed, recorded, and analyzed interviews with local leaders about the development of their communities and associated socio-economic challenges (interviews were performed in Spanish).

**Shriners Hospital for Children, Salt Lake City, UT** **2007-2008**  
Volunteer in Recreational Therapy. Organized and led activities for children with physical handicaps.