Sarah M **Brown**

Machine Learning Researcher ·
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Training

University of California, Berkeley — *Berkeley, CA*

Chancellor's Postdoctoral Fellowship — *January 2017 - present*

- Adviser: Michael I Jordan
- Proposal title: Machine Learning with Impact

Northeastern University — *Boston, MA*

PhD Electrical Engineering — *December 2016*

- Adviser: Jennifer G. Dy
- Dissertation Title: Machine Learning Methods for Computational Psychology

Northeastern University — *Boston, MA*

M.S. Electrical and Computer Engineering — *January 2014*

- Thesis Title:
- Concentration: Signal Processing

Northeastern University — *Boston, MA*

B.S. Electrical Engineering — *May 2011*

- Minor: Biomedical Engineering

Publications

Xu, Chenguang, Brown, Sarah M, Grant, Christan, "Detecting Simpsons Paradox" Thirty-first FLAIRS, 2018.

Brown, Sarah M, Rami Mangoubi, Andrea Webb, Jennifer Dy, "A Sparse Combined Regression-Classification Formulation for Learning a Physiological Alternative to Clinical Post-Traumatic Stress Disorder Scores" Twenty-Ninth AAAI Conference on Artificial Intelligence, 2015

Brown, Sarah M, Mario Hulett, "Variety of Community Partnerships in Related Programs" American Society for Engineering Education, Annual Conference and Exposition June 2013

Brown, Sarah, Lauren .D. Thomas, "Technical Outreach Community Help: Initial Results" American Society for Engineering Education, Annual Conference and Exposition June 2011

Brown, Sarah, Sherrette Yeates, Carey Rappaport. "Validating the Four-zero Conductivity Model for Wave Propagation in Dispersive Media with FDTD". Progress In Electromagnetics Symposium July 2010 abstract only

Vacca, Kaitlin, Sarah Brown, Rachelle Reisberg, Bala Maheswaran, Beverly Jaegar. Connections Physics Review Program Poster: American Society of Engineering Educators New England Section Conference April 2007

Experience

Fusion, Exploitation and Inference Technologies Group, Charles Stark Draper Laboratory Biomedical Signal Processing, Imaging, Reasoning and Learning Group, Northeastern University *Boston, MA*

Graduate Research Assistant *September 2011- April 2016*

- Translated psychophysiology expert's phenomenological experimental objectives into quantitative analyses
- Proposed methodology for a machine learning driven analysis of an emotion research experiment
- Evaluated performance of dynamic Bayesian network models on multisensor physiological time series data
- Applied and assessed feature selection techniques with respect to performance and interpretability
- Designed computational framework for a new theory of mind with psychology collaborator

Charles Stark Draper Laboratory *Cambridge, MA*

Co-op, Engineering Student, Fusion, Exploitation, and Interference Technologies Group *July 2010- August 2011*

- Improved usability and functionality of a MATLAB Graphical User Interface for data exploration and feature development
- Designed and conducted a mini-study to assessed utility of a GUI for exploration of unstructured mixed sensor data
- Developed a software environment for feature extraction in text and biometric keyboard dynamic settings

Bernard M Gordon Center for Subsurface Sensing and Imaging Systems *Boston, MA*

Undergraduate Research Assistant *June 2007- May 2011*

- Characterized stable conductivity model parameters of human tissue to enable simulation of nonionizing imaging
- Verified parameter fits in frequency domain with finite difference time domain electromagnetic simulations
- Automated integration of photographic anatomical data with tabulated dielectric data for MRI electric field simulation

BAE Systems *Hudson, NH*

Tech Intern I, Target Development Lab *July 2009-January 2010*

- Decreased runtime of MATLAB Digital Signal Processing routines to less than 10% by implementing them in CUDA
- Built a MATLAB graphical test environment for CUDA functions to ensure exact reproducibility
- Integrated CUDA modules into an existing software defined radio architecture to increase signal survey capabilities

Massachusetts General Hospital- Avon Comprehensive Breast Evaluation Center *Boston, MA*

Clinical Research Assistant *May-December 2008*

- Quantified noise and artifacts in images and made reductions to improve image quality
- Prepared study documents consistent with Institutional Review Board requirements
- Documented workflow and trained non-technical staff to maintain systems
- Designed phantoms for multiple imaging modalities

Teaching and Mentoring

Data Carpentry *October 2017-present*

Certified Instructor

- Completed 2 day instructor training, contributed to open source lesson
- Passed a 5 minute teaching demonstration using live coding

Black Engineering Student Society *June-December 2016*

Leadership Instructor, Graduate Adviser

- Facilitated strategic planning session to determine learning objectives and design training program
- Lead monthly leadership workshop series for executive board of the student chapter

Data Driven Discovery Research Experience for Undergraduate Site *June-August 2016*

Graduate Student Mentor, Instructor

- Taught two introduction to machine learning lectures for students between first and second years of undergraduate study
- Advised one student in 10-week research project

Northeastern University College of Engineering- Summer Bridge Program *August 2011*

Mentor

- Mentored incoming freshmen during a formal one week program
- Continued mentoring throughout academic year
- Facilitated leadership workshop at Engineering Professional Society Student Chapters' joint leadership retreat

Gordon Center for Subsurface Sensing and Imaging Systems *September 2007 – May 2011*

Gordon CenSSIS Scholar Mentor

- Mentored first year engineering students identified as Gordon Scholars
- Introduced students to resources within the center
- Shared research experiences with students and assisted students in finding a research adviser

Black Engineering Student Society Technical Outreach Community Help Center *August 2008 - April 2012*

Program Coordinator and Instructor

- Designed interactive lessons to introduce youth to Machine Learning topics
- Incorporated STEM content into digital media based lesson plans for youth
- Instructed adults in basic computer skills and youth 10-16 in intermediate-advanced topics
- Prepared lesson plans, presentation and handouts for weekly Computer Literacy class for adults
- Adapted ALICE programming course materials for youth programming course

Northeastern University College Of Engineering *January - April 2010*

Intro to Engineering Peer Mentor

- Mentored first semester engineering students in orienting to engineering and choosing a major within the college
- Assisted first-year academic adviser with course administration

Connections Physics Review *January - April 2007,2008*

Tutor in training (volunteer), Tutor

- Conducted weekly review sessions for 15-25 first year engineering students in Physics 1
- Prepared weekly review and equation sheets based on lectures
- Lead additional small group and individual problem solving sessions

Northeastern University School of Education *June – August 2007*

Mentor, Tutor

- Graded homework and kept attendance records for 10 students in an intensive summer pre-calculus course
- Analyzed homework and reported common errors to the instructor for review
- Compiled tips and equations to aid students in exam preparation and future assignments

Honors & Awards

Scholarships and Service Awards

April 2016	**Outstanding Graduate Student Award for Community Service**, Northeastern University
February 2013	**Mike Shinn Distinguished Member of the Year**, National Society of Black Engineers
March 2012	**BESS, SHPE and SWE Joint Alumni Award**, Northeastern University student chapters
April 2011	**Graduate Research Fellowship**, National Science Foundation
April 2011	**Ronald Guyer Porter Memorial Award**, Northeastern University Electrical and Computer Engineering Department
February 2011	**Draper Laboratory Fellowship**, Charles Stark Draper Laboratory
April 2011	**Outstanding Co-op Award, Engineerirng**, Northeastern University
2008,9,10	**Raytheon Scholars Program**,
March 2009	**Technical Outreach Community Help Member of the Year**, Nationa Society of Black Engineers
August 2008	**Monster Diversity Leadership Program Scholarship**, Lockheed Martin
June 2006	**Interact Scholarship**, Nashua Rotary West
June 2006	**John Morin Scholarship**,
April 2006	**Reggie Lewis Scholarship**, Northeastern University

Travel and Professional Development

May 2017	**Participant**, Launching Academics on the Tenure Track: an Intentional Community in Engineering	*Bainbridge Island, WA*
February 2016	**Participant and Presenter, travel funded**, Association for the Advancement of Artificial Intelligence Doctoral Consortium	*Pheonix, AZ*
October 2015	**Workshop attendee, travel funded**, University of Michigan College of Engineering NextProf Workshop	*Ann Arbor, MI*
April 2014	**Workshop attendee, travel funded**, CRA-W Graduate Cohort Workshop	*Santa Clara, CA*
2013	**Selected as attendee; 26% acceptance rate** , Machine Learning Summer School	*Tubingen, Germany*
August 2013	**Partial travel scholarship** , Broadening Participation in Datamining Workshop	*Chicago, IL*
December 2012,2015	**Poster Presenter, travel scholarship**, Women In Machine Learning Workshop, co-located with Neural Information Processing	*South Lake Tahoe, NV; Montreal, QC, Canada*

Presentations

Data Science for Social Good

Kansas City, MO

National Society of Black Engineers Annual Convention, Regional Conference, Zone Conference — *March 2017*

- Interactive workshop for approximately 30 participants
- Conceptual introduction to machine learning objectives, types of algorithms and design choices
- Lead Case studies of popular social impact applications of ML
- Facilitated activities for students to make high level design choices of ML solutions for social problems of their choosingn

Building and Leading Efficient Teams

Niagra Falls, NY

National Society of Black Engineers Regional Conference — *November 2016*

- Interactive workshop for ≈20 participants

"Machine Learning Methods for Computational Psychology"

Pheonix, AZ

Doctoral Consortium, Thirtieth AAAI Conference of Artificial Intelligence — *February 2016*

- Practice Dissertation talk

"Using Twitter to Empower Minority Women in STEM" *Boston, MA*

Richard Tapia Celebration of Diversity in Computing *February 2015*

- co-facilitated with Khalia Braswell a Birds of a Feather Session- interactive discussion
- Shared lessons learned and facilitated example twitter chat live

Service and Leadership

Reviewing

2016,2017 **Reviewer**, Machine Learning for Healthcare Conference

2017 **Reviewer**, International Conference on Machine Learning

2016,2017 **Reviewer**, Women in Machine Learning Workshop

2017 **Reviewer**, Black in AI Workshop

Institutional

2014-15 **Graduate Student Representative** , Provost Search Committee, Northeastern University

Professional Organizations

Broadening Participation in Datamining *August 2011*

General Co-chair

- Developed first corporate sponsorship packet
- Coordinated and moderated a Panel on Ethics and Fairness in Datamining
- Co-managed a team of 6 committee chairs to execute a two day workshop

Women in Machine Learning *2014, 2016- present*

Co-organizer and Finance Chair, Treasurer

- Managed corporate sponsorship process to reach new record high and 100% year over year increase
- Streamlined reimbursement processes for student travel grants for over 30 awards outside of NSF budget
- Oversaw budget to support a workshop including meals and logistics for over 120 attendees
- Supported co-organizers in all other details of coordinating a one day technical and professional development workshop
- Moved organization to accounting software and developed financial policies

National Society of Black Engineers *May 2014- April 2015*

National Academic Excellence Chair

- Strategized engagement plan resulting in 30% increase in repeat chapter participation in academic retention programming
- Managed a committee of twelve student volunteers to support academic programming and competitions
- Provided board level oversight of approximately $500k in scholarship and programming funds
- Engaged Minority Engineering Program Directors and Engineering Deans in a working session to improve working collaborations to increase URM graduation rates