Sarah M. Brown

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Education

Northeastern University

Predoctoral Candidate in Electrical Engineering
Candidate For Master of Science in Electrical Engineering   May 2013
Honors: National Science Foundation Graduate Research Fellowship, Draper Laboratory Fellowship
Advisors: Deniz Erdogmus (NU), Jennifer Dy (NU), S.R. Prakash (DL)

Northeastern University

Bachelor of Science in Electrical Engineering, magna cum laude   May 2011
Biomedical Engineering Minor
Honors: Dean's List, Gordon-CenSSIS Scholar, University Honors Program, Eta Kappa Nu

Skills

Languages: C, CUDA, C++, Latex
Applications: MATLAB, Mathematica
Machine Learning Interests: Feature Selection, Dynamic Bayesian Networks, topic models, Generative Models, Model Selection

Publications

Brown, Sarah, Jennifer Dy, S.R. Prakash, Andrea Webb."Dynamic Bayesian Networks for Emotion Modeling" Poster: Women in Machine Learning Workshop 2012

Brown, Sarah, Jennifer Dy, Deniz Erdogmus, S.R. Prakash, Andrea Webb. "Feature Selection for Emotion Modeling" Poster: Center for Digital Signal Processing Annual Workshop 2012

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

Brown, Sarah, Carey Rappaport. **"**Modeling FDTD Wave Propagation in Dispersive Media"
Poster: NSF Site Visit 2009, National Society of Black Engineers Region I Fall Conference 2009, NSF Site Visit 2010

Brown, Sarah, Jose Martinez-Lorenzo, Carey Rappaport. "Optimization of Antenna Excitations for High Field MRI"
Poster : CenSISS Research and Industrial Collaboration Conference October 2007, National Society of Black Engineers Region I Fall Conference 2007
- Tied, best poster in Subsurface Sensing and Modeling thrust at RICC by Industry judges

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

Technical Experience

Charles Stark Draper Laboratory and Biomedical Signal Processing, Imaging, Reasoning and Learning Group at Northeastern University
Graduate Research Assistant   September 2011-present
- 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

Charles Stark Draper Laboratory

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
Undergraduate Research Assistant September 2007- May 2011
Research Experience for Undergraduates June - August 2007
- 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
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
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

Service & Leadership Experience

Biomedical Signal Processing, Imaging, Reasoning and Learning Group
Reading Group Planning Committee January 2012 – present
- Facilitated logistical and technical preparation for paper discussion meetings in joint research group
- Regularly facilitated discussions and presented tutorials on relevant papers and texts

NU College of Engineering Student Research Engagement Committee
Founding Leadership Team August 2012 – present
- Established student leadership team to increase undergraduate involvement and graduate ownership in research
- Collaborated with the Assistant and Associate Deans to host events and create resources promoting research engagement

Charles Stark Draper Laboratory
NSBE Involvement Committee July 2011 – present
- Interfaced between NSBE collegiate leadership and Draper Human Resources in expanding partnership
- Identified and developed appropriate sponsorship opportunities based on corporate culture and recruiting strategies
- Coordinated and hosted annual corporate sponsored technical challenge competition

National Society of Black Engineers- Programs
National Programs Special Project Coordinator, National Programs Committee June 2012-present
- Facilitated zone wide effort to document NSBE programs policies in accordance with NSBE operations
- Assisted National Programs chair with re-design of Chapter of the Year Award selection process

National Society of Black Engineers-Technical Outreach Community Help
Technical Outreach Community Help Chair, National Programs Committee May 2010 – April 2012
Informal Science and Engineering Coordinator, National TORCH Committee August 2009 - April 2010
- Collaborated with Communications Zone to promote program resulting in tripled documented participation
- Designed a evaluation and research strategy to measure impact, improve chapter support and increase participation
- Managed $12,000 budget for national and regional conference service projects and chapter relief and seed funding
- Trained regional and alumni TORCH counterparts enabling training of chapter leadership
- Lead teams of three and six to improve technical community service resources, supporting 35,000 members globally
- Developed standards and resources to aid chapters globally in implementing youth STEM outreach programs
- Coordinated preparation and volunteer recruiting among members across the nation for an Informal Science and Engineering fair at 3 Annual Conventions

Black Engineering Student Society -Northeastern Chapter of National Society of Black Engineers

Alumni Relations Chair	May 2010 - April 2011
President	May 2009 – April 2010
Programs Chair	May 2008 – April 2009
Academic Excellence Chair	May 2007 – April 2009

- Coordinated cross participation among chapter and local alumni at programs and joint events
- Managed an executive board of 14 peers, to implement over $50,000 in programming and conference travel
- Collaborated with regional leaders and university staff to host a single-day conference with over 100 attendees
- Lead a team to design and teach two weekly computer classes at a local Public Internet Center
- Implemented Academic Excellence Month leading to designation as Regional Chapter of the Month: November 2007
- Chapter Recognized as Region 1 Chapter of the Year in 2007-09 and National TORCH Chapter of the Year in 2009-10

Gordon Center for Subsurface Sensing and Imaging Systems Student Leadership Council

Student Event Chair	May 2009-April 2010
President	January– May 2009

- Coordinated with center staff to plan student social and professional development events at semiannual conferences
- Facilitated leadership retreat to reestablish structure of the SLC
- Built a multi-institutional team to increase student involvement through professional development

Society of Hispanic Professional Engineers – Northeastern University Chapter

SHPE Junior Committee Co-chair	May 2007 – May 2008

- Collaborated with teachers to supplement orientation program at The Engineering School in Hyde Park, MA
- Lead workshops and meetings to prepare students to create a SHPE Jr. chapter

Mentoring and Teaching Experience

Northeastern University College of Engineering- Summer Bridge Program

Mentor	August 2011

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

Eta Kappa Nu

Member (volunteer)	January 2009-May 2011

- Maintained weekly office hour during class terms for Electrical and Computer Engineering course tutoring

Gordon Center for Subsurface Sensing and Imaging Systems

Gordon CenSSIS Scholar Mentor	September 2007 – May2011

- 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

Volunteer	May 2009-present
Program Coordinator	August 2008-April 2009

- 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

Intro to Engineering Peer Mentor (volunteer)	January - April 2010

- Mentored first semester engineering students
- Assisted first-year academic adviser with course administration

Exxon Mobile Bernard Harris Summer Science Camp

Overnight Counselor	July 2008

- Mentored students through evening bridge building project
- Responsible for four girls overnight

Connections Physics Review

Tutor   January - April 2008
Tutor in training (volunteer)   January - April 2007
- Conducted weekly review sessions for 15-25 first year engineering students in Physics 1
- Prepared weekly review and equation sheets based on lectures
- Held additional small group and individual tutoring appointments

Northeastern University School of Education

Mentor, Tutor   June – August 2007
- 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

Awards

NSBE Mike Shinn Distinguished Member of the Year: *February 2013*

Northeastern BESS, SHPE and SWE Joint Alumni Award: *March 2012*

National Science Foundation Graduate Research Fellowship: *April 2011*

Ronald Guyer Porter Memorial Award: *April 2011*

Draper Laboratory Fellowship: *March 2011*

Northeastern University Outstanding Co-op Award: *January 2011*

Raytheon Scholars Program: *May 2008, May 2009, May 2010*

NSBE Major Sponsor Scholarship: *March 2009*

NSBE Technical Outreach Community Help Member of the Year: *March 2009*

Lockheed Martin Monster Diversity Leadership Program Scholarship: *August 2008*

NSBE Region I Member of the Month: *November 2007, Summer 2008*

Nashua Rotary West Interact Scholarship: *June 2006*

John Morin Scholarship: *June 2006*

Reggie Lewis Scholarship: *April 2006*