

Melynda Schreiber

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EDUCATION

Ph.D Mechanical Engineering: Ergonomics and Safety

Spring 2020

University of Utah, Salt Lake City, Utah

- **Targeted Research Training Fellow** (meeting higher standards than peers, e.g., student mentoring, more advanced coursework, specialized safety seminars)
- **National Institute of Occupational Safety and Health Fellow**
- **Current Dissertation:** *Predicting EEG-Based User Intent to Reach, Grasp and Direction of Reaching*

Relevant Coursework and Skills

Coursework: Design of Experiments, Statistics for Engineers, Programming for Engineers,

Technical Skills: Python, R, LabView, Matlab, Docker, Spark, Arduino, Processing, Dash, Qt, Git, C++,
Latex, Embedded Systems, Microsoft Office

M.S Mechanical Engineering: Ergonomics and Safety – *NIOSH Traineeship*

2018

University of Utah, Salt Lake City, Utah

M.S Biomechanics and Movement Science: Motor Control – *NSF Bridge to the Doctorate Fellow*

2014

Bachelors of Mechanical Engineering; Minor: Biomedical Engineering

2011

University of Delaware, Newark, Delaware

PUBLICATIONS

Published

M Schreiber, M Trkov, and A Merryweather. Influence of Frequency Bands in EEG Signal to Predict User Intent. 9th International IEEE EMBS Conference on Neural Engineering. IEEE NER 2019, San Francisco, California, USA. March 20-23, 2019.

SW Logan, **M Schreiber**, M Lobo, B Pritchard, L George, JC Galloway. Real-world performance: physical activity, play, and object-related behaviors of toddlers with and without disabilities. *Pediatric Physical Therapy* 27 (4), 433-441.

SW Logan, MA Lobo, HA Feldner, **M Schreiber**, M MacDonald, Haylee N Winden, Tracy Stoner, James Cole Galloway. Power-up: exploration and play in a novel modified ride-on car for standing. *Pediatric Physical Therapy* 29 (1), 30-37.

SW Logan, SM Ross, **M Schreiber**, HA Feldner, MA Lobo, MA Catena, Megan MacDonald, James C Galloway. Why we move: social mobility behaviors of non-disabled and disabled children across childcare contexts *Frontiers in public health* 4, 204.

Manuscripts in Preparation

M Schreiber, M Trkov, and A Merryweather. Predicting User Intent of Gross Motor Movement in the Upper Extremity. *Journal of Neuroengineering and Rehabilitation Science*

Factorial Analysis of Strength Characteristics of 3D Printed Parts. **M Schreiber**, U Nze, and A Merryweather. *Journal of Additive Manufacturing*.

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PRESENTATIONS

Schreiber, M.A., Logan, S.W., Galloway, J.C. (April, 2014). *Mobility and Socialization: Goal Standards and Use of a Modified Standing Car in a Preschooler with a Disability*. NORA Conference 2014. Salt Lake City, UT.

Schreiber, M.A., Logan, S.W., Galloway, J.C. (July, 2013). *Mobility and Socialization of Typically Developing Toddlers in Various Childcare Environments*. Thesis Defense. Newark, DE.

Schreiber, M.A. (January, 2012). *Open Area Harness System – A new device for the study of mobility and socialization*. New York City Louis Stokes Alliance for Minority Participation Bridge to the Doctorate Conference. Tampa, FL.

Schreiber, M.A. (October, 2011). *Open Area Harness System – A new device for the study of mobility and socialization*. 14th Annual Philadelphia Alliance for Minority Participation Research Symposium and Mentoring Conference. Philadelphia, PA.

PROJECTS

Dissertation: The Influence of Pink Noise on EEG-Based User Intent to Reach, Grasp and Direction of Reaching

- To investigate how pink noise influences the power spectral density used as input features to machine learning techniques to determine user intent
- Utilized sklearn, pandas, numpy, mlxtend and mne to run machine learning algorithms of raw eeg files. Used Sequential Forward Selection to determine optimal user-specific EEG configurations.
- Creating EEG and online machine learning to visually show intent to reach, direction of reaching and grasping.

Detection of Ergonomic Lifting Risk Using Machine Learning, Accelerometers and Pressure Insoles

- Various hazards are associated with the workplace that are unquantifiable using standard techniques. Small, non-invasive, non-constricting sensors are required to investigate hazardous workplace habits. Machine learning is one technique that can quantify types of lifts and lifting postures.
- Utilized sklearn, pandas and numpy to detect lifting, lowering and standing events.
- Creating a dashboard in DASH that syncs video and online machine learning to visually show event detection

Recreation of the Internal Structure of 3D Printed Parts

- Quantifying the strength of a 3D printed part based on their structure is difficult due to variations in internal structure. The goal of this project is to read the GCODE from 3D printed parts and to virtually recreate the internal structure to make a solid model. This solid model may be imported into other modeling software such as ANSYS.
- Utilized Fusion 360 Python API and native python libraries to read gcode and parametrically recreate internal structure.

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Data Mining the Popular Game Fortnite

- Fortnite is a competitive battle royal game that utilizes building and weapon use to protect against and eliminate players. Due to its competitive nature, analyzing professional game play may improve individual game play. However, games must be data mined to determine how user play.
- Utilized PIL, OpenCV, and OCR to read the text of local game play video files. Creating a Qt GUI and Dash dashboard to summarize information about time series game play
- Plan to extend this further to improve OCR image recognition with noisy backgrounds, programmable labels of weapons and consumables based on OCR text recognition and deep learning implementation to recognize players, weapons, consumables, materials and other game related items.

WORK EXPERIENCE

Teaching Assistant, Design of Experiments – University of Utah **Spring 2019**

- Created and graded various exam and homework assignments for students.
- Assisted in statistical coding help for multiple languages including Python, R and Matlab.

doTERRA - Teaching Assistant, Advanced Safety Solutions – University of Utah **Fall 2018**

- Advised a team of engineers, doctors and industrial hygienists on investigating worker safety solutions.
- Aided team in identifying areas of improvement in ergonomics assessment.

Haemonetics – Manufacturing Extension Partnership – University of Utah **Aug 2017 – Oct 2017**

- Wrote LabView code to collect pinch forces and muscle forces in fine motor task pinch task.
- Performed ergonomic evaluation on three tasks relating to pinch force and manual material handling.

Volunteer Intern, Neuroworx – Salt Lake City, Utah **May 2017 – Aug 2017**

- Designed and 3D printed custom fit items for patients in need.
- Collaborated with various rehabilitation professionals.

Teaching Assistant, Ergonomics – University of Utah **Fall 2016, Fall 2017**

- Advised 100+ engineers, doctors and industrial hygienists per semester on ergonomics tools
- Involved two teaching assistants in achieving class goals such as grading of student papers and exams.

Volunteer, University of Utah Hospital – Salt Lake City, Utah **Jan 2016 – Dec 2017**

- Utilized parametric design using the Python API in Fusion 360
- Utilized soft modeling using AutoCAD and Meshmixer
- Worked with therapists and doctors to create custom fit items for patients in need.

Georgia Pacific – Consulting – Las Vegas, Nevada **Fall 2015 - Fall 2017**

- Worked with multiple plant managers to provide ergonomic solution.
- Tested and created abatements to remove grip force concerns.
- Suggested engineering controls to reduce the root cause of the problem.

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LEADERSHIP AND SERVICE

President of American Society of Safety Professionals University of Utah Student Section (Aug 2016 – Present)

University of Utah Rehabilitation Clinic Volunteer (2016-2017)

AWARDS

Occupational and Environmental Health Graduate Research Award (2018-2019)

Targeted Research Training Funding Scholar (August 2017 – Present)

Get Seeded Competition Winner \$1,900 (February 2017)

Honorable Mention Auburn Engineers eTools Ergonomics Competition (2016)

2nd-Place Auburn Engineers eTools Ergonomics Competition (2014)

National Institute of Occupation Safety and Health (NIOSH) Fellow (2014 – Present)

National Science Foundation Bridge to the Doctorate (NSF BTD) Fellow (2012 – 2014)

Dr. Paul S. Richards Workplace Safety Scholarship (August 2014 – Present)

SEED Scholarship (2008-2010)

Air Force Aid Society Scholarship (2008-2010)

LANGUAGES

Spanish (3 years – high school, 1 year – college)