

# MARISSA GRAY

marissa\_gray@brown.edu

## EDUCATION

Stevens Institute of Technology, Hoboken, NJ

**Ph.D. in Biomedical Engineering**

May 2014

Dissertation: "Evaluating the Effect of Bit Rate on the Quality of Portable Ultrasound Video."

Stevens Institute of Technology, Hoboken, NJ

**M.E. in Biomedical Engineering**

May 2011

Worcester Polytechnic Institute, Worcester, MA

**B.S. High Distinction in Biomedical Engineering**

May 2009

Areas of Concentration: Bioinstrumentation and Biosensors

Minor: Electrical and Computer Engineering

## AWARDS

Sheridan Center Junior Faculty Teaching Fellow, *Brown University*

September 2019 – May 2020

Visiting Faculty Research Fellowship at the *Army Research Laboratory*

June 2018 – August 2018

Innovation and Entrepreneurship Fellowship, *Stevens Institute of Technology*

August 2009 – May 2014

## WORK EXPERIENCE

Brown University, Providence, RI

**Master's Program Director, Center for Biomedical Engineering**

**Department of Biology Education, Division of Biology and Medicine**

January 2019 - Present

- Manages the Biomedical Engineering Masters of Science program
- Advises over 45 graduate students while coordinating research activities and programming
- Directs the design and non-thesis tracks of the program which includes part-time students
- Leads marketing and recruitment of the Masters program

**Assistant Professor of Engineering (Research)**

**School of Engineering**

January 2019 – Present

- Conducts clinical research that incorporates wearable sensor technology and processing of physiological signals using Machine Learning techniques
  - Current collaborations include projects with the Radiation Oncology Department at Rhode Island Hospital and strategic project planning with the School of Engineering.
- Serves as an undergraduate concentration advisor and provides teaching support for capstone design course

Stevens Institute of Technology, Hoboken, NJ

**Associate Chair of Graduate Programs**

**Department of Biomedical Engineering**

July 2015 - December 2018

- Reviewed and coordinated decisions for all Masters applications among 4 programs
- Advised over 40 graduate students and coordinated graduate advising efforts
- Collaborated with the Graduate Admissions Department and faculty to manage, promote, and enhance departmental graduate programs

**Biomedical Engineering Teaching Assistant Professor**

August 2014 – December 2018

- Taught Introduction to BME, discussion-based graduate course Strategies and Principles of BME Design, developed and taught course on Writing BME Publications; Advised Senior Design teams and gave lectures on Wireless Applications of BME devices
- Accreditation Coordinator for BME Department: ABET and Middle States
- Advised over 80 undergraduate and graduate students and several research teams

Stevens Institute of Technology, Hoboken, NJ

**Course Developer**

August 2011 – May 2014

- Developed a new multidisciplinary senior design course
- Interacted with students to help develop novel design ideas and course concepts

**RESEARCH EXPERIENCE**

Brown University, Providence, RI

June 2019 – Present

**Monitoring Anxiety of Radiation Oncology Patients Using Wearable Technology***Co-PI with Reshma Munbodh, Department of Radiation Oncology of Rhode Island Hospital*

- Planning clinical study to monitor anxiety of radiation patients while receiving radiation therapy
- Using Empatica E4 biosignal sensor to detect physiological features of anxiety
- Applying machine learning algorithms to characterize anxiety in patients
- Collaborating with faculty from Computer Science and Psychiatry & Human Behavior

Army Research Laboratory, Aberdeen Proving Ground, MD

June 2018 – August 2018

**Design of a Novel Conductive Polymer-based EEG System**

- Integrated PDMS-based dry electrodes into an EEG headset system that can highlight various ARL BCI-based technologies
- Developed Carbon Nanofiber PDMS electrodes for use in headsets
- Acquired and processed EEG signals using BCI 2000 and MATLAB

Stevens Institute of Technology, Hoboken, NJ

August 2014 – May 2017

**Personal Flotation Device****Sponsored by Naval Special Operations Command of the U.S. Department of Defense****Special Operations Command (SOCOM) Grant through Systems Engineering Research Center***PI: Marissa Gray \$14,000 Grant to prepare device for commercialization. May 2016 – May 2017*

- *Personal Flotation Device* – Developed by multiple student design teams over a span of two years. Multi-modal device uses pressure and time activated sensors to automatically inflate a personal floatation device worn by a Navy SEAL operator. A proof of concept, Alpha prototype, and a pre-commercialized Beta prototype has been developed and tested. Presented at the Northeast Bioengineering Conference (NEBEC)

Stevens Institute of Technology, Hoboken, NJ

Hackensack University Medical Center Emergency Department, Hackensack, NJ

**Quality Analysis of Wirelessly Transmitted Portable Ultrasound Video**

August 2014 – October 2015

- Principal Investigator of extensive objective and subjective analysis of previous research

**Ph.D. Dissertation Research: Wirelessly Transmitted Ultrasound Video**

May 2010 – May 2014

- Department of Defense funded project to develop communications system that transmits medical images wirelessly and in real time for emergency casualty care
- Technical development of wireless system alongside team of physicians and engineers
- Quantified technical image specifications using MATLAB and International Telecommunications Union protocol ITU-R BT.500-11 to develop a quality control standard while making image processing improvements. Video acquired via IRB approval

**SELECTED PUBLICATIONS AND PRESENTATIONS***“Detecting Anxiety Trends Using Wearable Sensor Data in Real-world Situations”*

December 2021

*M. Gray, S. Majumder, K. Nelson, R. Munbodh*Podium Presentation at DataMod 2021, 10<sup>th</sup> International Symposium [Virtual Conference]*“Predictors of Anxiolytic Requirement During Radiation Therapy With Thermoplastic Mask Immobilization”*

November 2021

*E. Nack, M. Sueyoshi, M. Gray, D.E. Wazer, R. Munbodh*

Int. J. Radiat. Oncol. Biol. Phys. No. 3, Vol 11, November 2021.

*“Development of Novel Dry EEG Electrode Design.”*

October 2019

**M. Gray, M. White, W. D. Hairston, J. C. Bradford**

Poster Presentation at the 2019 Biomedical Engineering Society Annual Meeting [Philadelphia, PA]

*"Salivary Lactate Sensor for the Detection of Colic in Horses."*

**March 2018**

**C. Cline, A. Bossart, D. Di Domenico, A. Paciulli, M. Gray**

Poster Presentation at the 2018 Northeast Bioengineering Conference [Philadelphia, PA]

*"Ultrasonic Sensor to Quantify Brain Pulsatility."*

**November 2017**

**N. Fosko, A. Bhalla, G. Atlas, M. Gray**

Podium presentation at the 2017 IEEE MIT Undergraduate Research Technology Conference [Cambridge, MA]

*"Pressure Validation of Navy SEAL Personal Flotation Device."*

**October 2017**

**C. Sinatra, A. Bhalla, S. Jacobson, J. Martinez, M. Youssef, M. Marnell, M. Gray**

Podium Presentation at the BMES Annual Meeting 2017 [Phoenix, AZ]

*"Analyzing quality of compression schemes used in wirelessly transmitted ultrasound video."*

**October 2015**

**P. Ruiz, V. Hazelwood, M. Gray**

Poster presentation and publication at the 2015 Biomedical Engineering Society Annual Meeting [Tampa, FL]

*"Evaluating the effect of bit rate on quality of portable ultrasound video."*

**April 2015**

**M. Gray, H. Morchel, V. Hazelwood**

Poster presentation and publication at the 2015 IEEE International Symposium on Biomedical Imaging

*"Evaluating the effect of bit rate on ultrasound video quality."*

**May 2014**

**M. Gray, H. Morchel, O. Hadar, V. Hazelwood**

Poster presentation at the International Congress of Imaging Science [Tel Aviv, Israel]

*"Evaluating the effect of bit rate on ultrasound video quality."*

**February 2014**

**M. Gray, H. Morchel, V. Hazelwood**

Poster presentation at Johnson & Johnson Engineering Showcase [Johnson & Johnson World Headquarters, New Brunswick, NJ]

*"A novel portable telephonography system for prehospital trauma care."*

**August 2011**

**C. Ogedegbe, V. Hazelwood, H. Morchel, S. Vets, B. Chang, M. Gray, J. Feldman**

Poster presentation at the Advanced Technology Applications for Combat Casualty Care Conference [Fort Lauderdale, FL]

## SERVICE

### Professional Service

DOD SMART Scholarship Review Panelist

**December 2020 – January 2021**

IEEE P1752 Open Mobile Health Standards Development

**December 2017 – Present**

National Science Foundation Graduate Research Fellowship Program Panelist

**December – March 2019**

Biomedical Engineering Society Annual Meeting Session Chair – Wearable Sensors

**October 2017**

National Defense Science and Engineering Graduate (NDSEG) Fellowship Review Panelist

**January - February 2016**

## SKILLS

**Computer:** MATLAB/Simulink, Adobe Premiere & Audition, Rhino Computer Aided Design

**Clinical:** Analyze Sonosite portable ultrasound video. Perform wireless transmission of medical data in a hospital environment.

## MEMBERSHIPS

New York Academy of Sciences – 1000 Girls 1000 Futures Mentor, Group Leader, and Mentor Coordinator

Institute of Electrical and Electronics Engineers (IEEE)

Biomedical Engineering Society (BMES)

Alpha Eta Mu Beta Biomedical Engineering Honor Society