

# Andrea Jacobson

3603 Partridge Path APT 6, Ann Arbor, MI 48108 | 765-479-9640 | andijaco@umich.edu

## EDUCATION

**University of Michigan | GPA: 4.00 / 4.00 | First Year PhD Student in fMRI Research Lab**  
Rackham Graduate School

Doctor of Philosophy in Biomedical Engineering

**Indiana University Purdue University Indianapolis (IUPUI) | GPA: 3.66 / 4.00 | Graduated May 13, 2023**

Purdue School of Engineering and Technology

Bachelor of Science in Biomedical Engineering | Mathematics Minor

## AWARDS

- **William Plater Civic Engagement Medallion (2023)**
- **IUPUI Top 10 Outstanding Student Award (2022)**
- **Women's History Month Recognition Award (2022)**
- **Coburn Place Volunteer Award (2022)**
- **Biomedical Engineering Outstanding Service (2022)**
- **Advocacy Leadership Award & Outstanding Community Service & Outreach Award (2021)**
- **Jesse H. & Beulah Cox Scholarship (2019 – 2023)**

## COURSEWORK, CERTIFICATIONS, SKILLS

### Graduate Coursework

- **Medical Imaging Systems Lecture BIOMEDE 516**
- **Medical Imaging Systems Lab BIOMEDE 510**
- **Matrix Methods for Signal Processing EECS 551**
- **Digital Signal Processing I ECS 538 - IUPUI**
- **Design with Embedded Systems ECS 5681 - IUPUI**
- **Neural Engineering BME 595 - IUPUI**
- **Statistics for Biomedical Engineering BIOMEDE 503**
- **Project Management and Consulting ENTR 560**

### Certifications/Skills

- **CPR/BLS certified with American Red Cross**
- **Proficient in MATLAB, C, and Julia Coding**
- **Comprehensive technical report drafting and data analysis.**
- **Practical understanding of engineering and research protocols.**
- **Empathetic, driven leader with extensive experience in event and project planning**

## RESEARCH & ACADEMIC WORK

### Graduate Researcher | Functional Magnetic Resonance Imaging (fMRI) Lab | July 2023 - Present

- **Working to discover efficient and accurate protocols on the 7T MRI scanner** that will allow for multi-dimensional (ex T1-T2) experiments to run within a time frame that is feasible with the aim to better assess tissue microstructure and chemistry.
- Submitted a National Science Foundation grant, honing skills in literature review, technical writing, and project planning.
- Developed a MATLAB in-silico model of multi-compartmental materials with known relaxometry and diffusion characteristics to serve as a reference for analysis of more complex materials, such as sheep or human brain samples.

### Undergraduate Researcher | Quantitative Imaging and Spectral Technologies Lab | December 2021-September 2023

- **Utilized self-taught multi-modal image processing techniques** to study if ultra-short echo time (UTE) MRI can serve as an innocuous/precise replacement for high resolution peripheral quantitative computed tomography (HR-pQCT).
- Co-authored a MATLAB 3D medical imaging registration script for use in a research core facility that corrects stack shifts in metatarsals from patient movement during clinical HR-pQCT imaging.

### MOSAIC Project Volunteer Researcher | Socio-neural Physiology Lab | August 2022 - January 2023

- Assisted in hosting focus group to discover which aspects of acceptance and commitment therapy would be best to incorporate into a heart rate variability sensor (polar verity) controlled app that delivers **therapeutic support to breast cancer survivors**.
- Providing insight to UX designers and cancer survivors during the co-design app meetings to help develop a feasible product.

### Undergraduate Researcher | Bone Biology and Mechanics Lab | August 2021-August 2022

- **Planned and performed thermoneutral housing study** for improved preclinical animal models for osteoporosis treatments.
- **Utilized mechanical tester, micro-computed tomography (SKYSCAN 1172), image processing software (nRecon and DataViewer), and GraphPad Prism** to understand how different housing temperatures impacted structure and mechanical function of trabecular bone in vertebrae.
- Organized bone soaking experiments and executed four-point bending to test for improved mechanical integrity.

## PUBLICATIONS, GRANTS, CONFERENCE TALKS & POSTERS

### Publications

1. **Jacobson A** et al., "A Comprehensive Set of UTE-MRI Biomarkers to Assess Cortical Bone Health..." Bone, April 2024
2. Surowiec R, ... **Jacobson A**, et al, "Ex Vivo Exposure to ... Raloxifene Improves Mechanical Properties," Bone, May 2023.
3. Surowiec R, ... **Jacobson A**, et al, "Combining Raloxifene and Mechanical Loading Improves Bone Composition and Mechanical Properties in a Murine Model of Chronic Kidney Disease," [Submitted], Bone.
4. **Jacobson A**, Tastad C, Creecy A, Wallace JM, "Combined Thermoneutral Housing and Raloxifene Treatment Improves Trabecular Bone Microarchitecture and Strength in Growing Female Mice," Calcified Tissue International, Oct 2022

## **Undergraduate Research Grants (UROP)**

1. '3D Ultra-Short Echo-Time Magnetic Resonance Imaging...' – *Mentored by Rachel Surowiec (2022-2023)*
2. 'Effects of Thermoneutral Housing on Trabecular Bone' – *Mentored by Joseph Wallace (2021-2022)*

## **Conference Talks & Posters**

1. **Jacobson A**, Surowiec R, "An MRI-based Approach for Characterizing Bone Mineral Density and Cortical Porosity: Comparing Ultrashort Echo Time MRI with HR-pQCT," BMES, Oct 2023. – *Conference Talk*
2. **Jacobson A**, Surowiec R, "An MRI-based Approach for Characterizing Bone....," ASBMR, Oct 2023. - *Poster*
3. **Jacobson A** et al., "Custom MATLAB Registration Script for Stack Shift Correction of Multi-stack HR-pQCT Scans of the Metatarsals," ASBMR, Oct 2023 - *Poster*
4. Petranek S, ... **Jacobson A**, et al., "The Art of Medical Imaging," RSNA, Nov 2022. – *Conference Talk and Exhibition*
5. **Jacobson A**, ... Wallace J, "Effects of Thermoneutral Housing," BMES, Oct 2022. – *Poster*
6. **Jacobson A**, ... Wallace J, "Effects of Thermoneutral Housing," Purdue Virtual Graduate Showcase, Sept 2022. – *Poster*

## **INDUSTRY & SERVICE WORK**

### **Roche Diagnostics | Commercial Education Intern | May 2022 – August 2022**

- **Authored benchmark guides / user manuals for new and complex diagnostic instruments**, such as the Ultra Plus (for bulk immunohistochemistry and in-situ hybridization slide staining) and Ventana HE 600 (automated H&E stainer), in Adobe InDesign to guide new users on through procedures for instrument usage, maintenance, and troubleshooting.
- Received **field service engineering training** and helped perform periodic maintenance tasks on chemistry analytic units.
- Helped to streamline the FDA regulation approval process for an engineering group within Roche Diabetes Care.
- Drove utilization of the cobas 68/8800 (automated molecular testing instrument) online training platform by reviewing stakeholder feedback, creating an automated communication plan, and creating quick reference cards for account executives.

### **Biomedical Engineering R&D Intern | Helmer Scientific | May 2021 – August 2021 & Winter Break 2021**

- **Wrote and uploaded detailed technical reports** to Helmer's testing bank in the secure approved server.
- **Followed NSF vaccine standard protocol to compare refrigeration units.**
- Researched, designed, and tested a bactericidal water filter for use in a plasma thawer.
- Performed comparative tests on compressors for implementation in future products.
- Recorded temperature, wattage, current, and pressure with the fluke Data Acquisition Unit.

### **Server | Cracker Barrel | December 2018 – May 2020**

- Provided exceptional customer service by working efficiently to take care of multiple customers.
- Managed five or more tables an hour with a sanguine and mature disposition.
- Assisted my fellow servers through collaboration to maintain a stress-free environment.

## **INVOLVEMENT & COMMUNITY SERVICE PROJECTS**

### **Tutor | End the Cycle | January 2024 – Present**

- Providing tutoring to students who have struggled with homelessness, limiting their ability to keep up with course work.
- Assist students in learning how to problem solve and how to be resourceful.

### **Mentor | Graduate Application Assistance Program | August 2023 – Present**

- Coaching students from underrepresented backgrounds on how to construct resumes and personal statements.

### **President | American Society of Engineering Education | August 2023 – Present**

- Hosting monthly book clubs focused on engineering education.
- Helped to organize an event titled "The Teaching Side of Academia" to connect interested graduate students to teaching staff.

### **Mental Health/DEI Committee | BME Graduate Student Council | August 2023 – Present**

- Plan events for graduate students to connect with resources (ex: Counseling and Psychological Services) to better mental health and to foster community.

### **President and Founder | Domestic Abuse Prevention Student Organization | November 2019 – May 2023**

- **Founded and passed on a sustainable student organization (150+ members) that aimed to "support survivors of domestic abuse through volunteer work and advocacy".**
- Collaborated with the IUPUI Assistant Director of Interpersonal Violence Prevention to form a coalition on campus to promote and fund volunteer efforts aiming to support survivors of domestic violence.
- Launched Activity Night Series (SOG Funded) with Coburn Place to provide struggling families with fun, relaxing yoga nights, a STEM fair, painting nights, and literature nights (with book donations).
- Assembled a leadership team to help plan events faster, to delegate organizational tasks, and sustain the organization.