KATELYN MICHELLE HALL

(304) 906-9591 — khall82@gatech.edu

EDUCATION

Georgia Institute of Technology (Georgia Tech) — *(Atlanta, GA)* Graduated December 2024

Bachelor of Science in Biomedical Engineering, with Highest Honors, GPA 3.6/4.0

Graduated from the Honors Program with Distinguishment in Research and Global Engagement Pathways

- Relevant Coursework: Capstone Design, Biomedical Systems and Modeling, Biotransport, Physiology of Cellular and Molecular Systems, Quantitative Engineering Physiology Lab I & II, Tissue Engineering, Intro to Neuroengineering, Circuits & Electronics, Intro to Biomechanics, Instrumentation & Electronics Lab, Principles and Applications of Engineering Materials, Survey of Biochemistry, Organic Chemistry I & II, Synthesis Lab, Intro Physics II, Intro to Biomedical Engineering Design, Conservation Principles in BME, Problems in Biomedical Engineering, Introduction to Bioengineering Statistics, Intro to Linear Algebra, Multivariable & Differential Calculus, Computing for Engineers, Statics, The Art of Telling Your Story, Elementary Russian I & II

University High School (UHS) — *(Morgantown, WV)* Graduated May 2021

GPA 4.4/4.0

RESEARCH

Research Specialist — ***Emory School of Medicine Ophthalmology Pardue Lab*** Aug. 2022 - Present

- Conducted experiments in Dr. Machelle Pardue's lab on myopia development, analyzing data using statistical software and managing the care of mice in compliance with ethical guidelines.
- Operated specialized equipment (photorefractors, keratometers, OCTs) to measure eye growth and diagnose myopia, while designing and coding visual stimuli for environmental impact studies.
- Awarded the Presidential Undergraduate Research Award (PURA) for Spring 2024 to lead independent research on myopia recovery in induced myopia mouse models, aiming to determine the timeframe for recovery.
- Currently researching how different light environments affect retinal dopamine levels in induced myopia models and the role of melanopsin in OPN4 mouse models.

PUBLICATIONS

- Lou, Linjiang, Hall, Katelyn M., Pardue, Machelle T. **"Measurement of Ocular Dimensions in the Mouse Eye with Different OCT Alignment Methods and Lens Powers."** *Investigative Ophthalmology & Visual Science.* 2024; 65(7):1160. Open Access Link
- Lou, Linjiang, Hall, Katelyn M., Pardue, Machelle T. **"Effect of OCT Alignment on Ocular Parameters in the Mouse Eye."** *Investigative Ophthalmology & Visual Science.* 2023; 64(8):847. Open Access Link

PROFESSIONAL & SHADOW EXPERIENCE

Shadow Experience @ Mon Health Medical Center — ***Morgantown, WV*** June 2022 - Aug. 2022

- Observed Dr. Jennifer Sivak-Callcott in clinic visits and oculofacial surgeries, gaining insights into diagnosis, treatment planning, and surgical techniques for procedures like blepharoplasty, ptosis repair, and melanoma excisions with Hughes Flap reconstruction.
- Engaged in patient interactions to better understand diagnoses and care strategies, while assisting with pre- and post-operative care, including patient education, wound care, and medication management.

XiCha Bubble Tea & Hershey's Ice Cream *(Employee)* — ***Morgantown, WV*** June 2021/2022- Aug. 2021/2022

- Delivered outstanding customer service through efficient order-taking and preparation, inventory management, and diligent sanitation practices, enhancing customer experience and boosting business retention.

ACADEMIC DESIGN PROJECTS

PeePal by WeeCare: Provisional Patent Filed Aug. 2024 - Dec. 2024

— ***Georgia Tech Capstone***

- Collaborated with Interventional Radiology at Emory University Hospital to conduct user interviews and observations, identifying key design inputs for PCN catheter patients.
- Designed and prototyped a concealable, comfortable drainage bag that addressed user needs for securement, comfortability, and concealability, as well as standardized care instructions.
- Conducted a patent search and successfully filed a provisional patent for the PeePal under the company name WeeCare.

Evaluating Coffee-Derived Compounds on Triple-Negative Breast Cancer Cells Aug. 2024 - Dec 2024

— ***Quantitative Engineering Physiology Laboratory II***

- Investigated the effects of caffeine, caffeic acid, and caffeic acid phenethyl ester on cell viability and apoptosis in MDA-MB-231 triple-negative breast cancer cells.
- Conducted and designed controlled experiments using CCK-8 assays and Annexin V flow cytometry to evaluate time- and dose-dependent effects over 24–72 hours.
- Gained expertise in cell culture, assay development, and statistical data analysis to assess the potential therapeutic roles of coffee-derived compounds.

Muscular Dystrophy Strength and Modulation Device May. 2024 - July 2024

— ***Intro to Neuroengineering***

- Ideated a wheelchair-integrated device concept using high-voltage pulsed galvanic stimulation (HVPGS) to monitor and modulate muscle strength in muscular dystrophy patients.
- Proposed features including sensors to measure quadriceps and gastrocnemius strength and an adaptive algorithm concept to personalize treatment based on patient-specific data.
- Developed skills in problem definition, user-centered ideation, and theoretical modeling to address unmet clinical needs.

The Effect of Text Contrast and Size on Muscle Strain in Myopic Students Jan. 2024 - May 2024

— ***Quantitative Engineering Physiology Laboratory I***

- Conducted an electromyographic analysis to investigate the impact of text contrast and size on muscle activation and strain in myopic versus non-myopic individuals.
- Designed and executed experiments with 36 participants, collecting and analyzing data using Arduino circuits and electrodes to measure activation in temporalis and splenii capitis muscles.
- Developed skills in experimental design, data collection, and statistical analysis to identify ergonomic factors influencing musculoskeletal strain during visual tasks.

Handheld Helpers: Ergonomic Laparoscopic Grasper Design Jan. 2024 - May 2024

— ***Intro to Biomedical Engineering Design***

- Conducted user interviews with surgeons from across the East Coast to identify ergonomic challenges with laparoscopic graspers for female surgeons.
- Applied human-centered design methods to create a prototype addressing user needs, including reducing strain, improving comfort, and enhancing control during minimally invasive surgeries.
- Developed skills in concept ideation, rapid prototyping, and usability testing, culminating in a Design History File and a validated final concept.

Parkinson's Detection Shoe Sole: A Device for Early Symptom Identification Jan. 2023 - May. 2023
— ***Problems in Biomedical Engineering***

- Designed a cost-effective, reusable shoe sole prototype with embedded sensors for detecting early symptoms of Parkinson's Disease in underserved populations.
- Conducted user research and applied data analysis to optimize the prototype for comfort, accuracy, and usability, leveraging Arduino and MATLAB for data acquisition and processing.
- Developed skills in iterative prototyping, testing on diverse terrains, and refining exclusion criteria for accurate detection of gait asymmetry.

LEADERSHIP EXPERIENCE

MCAT Club @ GT (*President* 2024-Present, *Vice President* 2023-2024)— *Georgia Tech* May. 2023 - Dec. 2024

- Co-founded a student organization to increase accessibility to MCAT resources for pre-health students, including a free MCAT book rental system, a study buddy program, and organized practice test sessions.
- Collaborated with Georgia Tech Pre-health services to establish an MCAT tutoring service for Georgia Tech students.
- As President, led club operations and outreach efforts to ensure the sustainability and growth of the organization, such as applying and receiving $2000 from Georgia Tech Student Foundation to fund club resources.

Campus Kitchen Project @ GT (CKP)
(*Vice President of Engagement* 2023-Present, *Shift Captain* 2022-Present)— *Georgia Tech* Aug. 2022 - Dec. 2024

- Led food recovery meetings at student dining halls, guiding volunteers and managing the packaging and transportation of meals to on-campus food banks and off-campus community kitchens.
- Developed strategies to boost member engagement through volunteer work, social events, and collaborations with other campus groups, resulting in increased participation and food donations.

Georgia Tech Glee Club (*Liaison* 2024-Present, *Publicist* 2023-2024)— *Georgia Tech* Aug. 2023 - Present

- Reorganized social media platforms to centralize club information and led recruitment efforts at events.
- Managed gig requests as liaison, coordinating event details with clients, confirming payment, and communicating performance logistics (songs, times, locations) to officers and members.
- Assisted in planning club trip to Japan by planning activities and contacting locations for performances abroad.

Pi Epsilon Phi (*Publicist)* — *Georgia Tech* Aug. 2024 - Dec. 2024

- Aided in recruitment efforts and managed the fraternity's Instagram account, posting updates about the brothers' activities.
- Supported the mission of fostering leadership, high-performance standards, and unity by promoting the fraternity's service work, including organizing choir music libraries and assisting with concert logistics.

SEED (SEEk Discomfort) First-Year Leadership (*Advisor)* — *Georgia Tech* May 2023 - May 2024

- Facilitated weekly meetings and activities to mentor 21 freshmen, encouraging them to step outside their comfort zones in alignment with SEED's belief that growth comes from discomfort.
- Organized events such as polar plunges, sharing personal insecurities with strangers, and breaking the world record for the longest game of four square, fostering both individual and group development.
- Promoted leadership growth by providing freshmen with opportunities to plan and lead their own events, offering guidance and support from advisors throughout the process, helping them build confidence and organizational skills.

Seek Discomfort Club (*Vice President)* — *Georgia Tech* May 2022 - May 2023

- Designed, planned, and led events that challenged members to step outside their comfort zones, develop resilience, and foster personal growth while making a positive impact on their community.
- Collaborated with other campus organizations to plan joint events/activities (ex. Cooking competition, Improv, Maid Cafe).
- Created and submitted bills to the student government to secure funding for events, demonstrating strong organizational and communication skills and a commitment to providing valuable experiences for fellow students.

COMMUNITY SERVICE

Madhatter Knits @ GT — *Georgia Tech* Jan. 2023 - Present

- Created over 100 preemie hats for hospital donation, supporting newborn care initiatives.

Cleanup Crew @ GT — *Georgia Tech* May 2022 - Dec. 2024

- Collaborated effectively with other volunteers to efficiently clean and maintain a litter-free campus environment.

Student Hospital Connections — *Georgia Tech* Sept. 2021 - Dec. 2024

- Sorted and organized donated medical supplies for distribution to hospitals in need in developing countries.
- Created scarves for homeless shelters by cutting up old donated shirts and assisting others during the process.