

Jordan B. Harrod

201D Alice Cook House, Ithaca, NY 14853 | jbh282@cornell.edu | 201.508.7380
GitHub: harrodjordan | linkedin.com/in/harrodjordan | Website: harrodjordan.github.io

EDUCATION

Harvard-MIT Health Sciences and Technology

Incoming Ph.D. Student in Medical Engineering and Medical Physics
Concentration in EECS

Cambridge, MA

May 2024 (expected)

GEM Associate Fellow

Sigma Xi Associate Member

Cornell University, College of Engineering

B.S. in Biomedical Engineering
Concentration in Bioinstrumentation and Imaging

Ithaca, NY

May 2018

Major GPA: 3.32/4.0

GRE: 169 Q, 163 V

Dean's List: Spring 2015, 2018, Fall 2017, Merit List (>3.0): Fall 2014, 2015, 2016, Spring 2016, 2017

ACADEMIC RESEARCH AND INDUSTRY EXPERIENCE

Undergraduate Research Assistant, Laboratories of Dr. Lawrence Bonassar and Dr. Lara Estroff, Meinig School of Biomedical Engineering/Department of Materials Science and Engineering Cornell University, Ithaca, NY

May 2015 – May 2018

I aim to characterize and replicate the meniscal entheses, which attach the meniscal body to bone.

- Created meniscal enthesis constructs using trabecular bone cores containing mineralization gradients and tested tensile strength of constructs to determine the ideal demineralization profile for enthesis.
- Created custom MATLAB scripts to analyze the demineralization profile of partially demineralized trabecular bone cores.
- Established a standardized demineralization procedure for trabecular bone cores to further improve the mechanical properties of meniscal enthesis constructs.
- Analyzed microCT scans of demineralized bone experimental samples qualitatively by creating 3D renderings in Avizo Fire.
- Implemented histological techniques to compare protein localization and collagen fiber alignment in meniscal enthesis constructs to the native enthesis.

Amgen Scholar, Laboratory of Dr. Lei Xing, Department of Radiation Oncology Stanford University, Stanford, CA

June 2017–August 2017

I aim to develop a neural network that will identify artifacts in real-time MRI imaging.

- Developed a generative recurrent convolutional neural network to generate the next image in a real-time MRI sequence for applications in real-time artifact detection.
- Developed a deep convolutional neural network that automates aliasing artifact identification on MRI images.
- Developed Python algorithm to introduce aliasing motion artifacts in complex-valued MRI images.

Biomarker Development Intern

Clinical and Translational Imaging Group, Novartis Institute for Biomedical Research East Hanover, NJ

Summer 2016

At Novartis, I aimed to more efficiently process Proof-of-Concept data for several pre-clinical drug trials using MATLAB, Spotfire, and Microsoft Office to prove their efficacy.

- Generated Proof-of-Concept data for several concurrent preclinical studies for transition to the next stage in FDA approval.

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- Analyzed optical coherence tomography images of intra-retinal fluids to determine drug efficacy on reduction of fluid volumes in a clinical trial.
- Validated novel software that aimed to better visualize intra-retinal fluids using three-dimensional reconstructions and user-delineated fluid selections.
- Evaluated clinical trial data to determine systemic and local effects of a new topical analgesic treatment using Spotfire and Microsoft Excel visualization and data analysis techniques.

Research Assistant

**Biomaterials and Interface Tissue Engineering Lab, Department of Biomedical Engineering
Columbia University, New York City, NY**

Summer 2014

At Columbia, I aimed to determine whether nanofiber polymer scaffolds intended for use in drug delivery could withstand the mechanical stresses experienced by the periodontal ligament.

- Mapped tensile properties of nanofiber scaffolds to validate them as a replacement for native periodontal ligamentous tissue.
- Electrospun polymer nanofiber scaffolds of different chemical compositions.
- Performed fluorescence assays on cell-seeded scaffolds to determine DNA content and cell viability.
- Performed mechanical testing to determine failure energies of polymer scaffolds and interpreted results using MATLAB and Microsoft Excel.

PUBLICATIONS

Jordan Harrod, Morteza Mardani, John Pauly, Lei Xing. “Deep Predictive Coding For Super Time-Resolved MR Imaging” (Abstract) Neural Information Processing Systems, 2017, December 9th, 2017

Jordan Harrod, Morteza Mardani, Lei Xing. “Automated Artifact Identification in MR Images Using Deep Convolutional Networks” (Abstract) BMES Annual Meeting, 2017, October 11th, 2017

Guillaume Normand, Eric H Souied, Bruno Lay, Ronan Danno, Rocio Blanco-Garavito, Perrinne Charrard, **Jordan Harrod**, Michael Maker, Sudeep Chandra, Georges Weissgerber. “Validation of 3D volumetry for a novel anti-angiogenic therapy of neovascular age-related macular degeneration” (Abstract), ARVO Annual Meeting 2017, May 8, 2017

PRESENTATIONS

Jordan Harrod, Morteza Mordani, Lei Xing. “Motion Artifact Detection for Real-Time MR Imaging” Stanford Summer Research Program Symposium. August 23, 2017

Team TransFur (**Jordan Harrod**, Elizabeth Feeney, Morgan Feldman, Priya Balasubramanian) “TransFur – Top 10 Finalist Presentation” Animal Health Hackathon, January 29th, 2017

PROJECTS

BME Senior Design (BME 4080/4090)

Cornell University Meinig School of Biomedical Engineering

Minimal Contact Rodent Vitals Monitoring System

Ithaca, NY

August 2017-May 2018

- Primarily worked to develop system user interface - analog signal processing, PID temperature control, analog circuit design, Python GUI development
- Developed a physiology monitoring system for anesthetized small animal surgeries
- Pitched system to potential investors, won first place in Design and Pitch at the 2018 Symposium

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Integrated Sensors and Actuators (ECE 4320)

Cornell University Department of Electrical and Computer Engineering

Motion-Based Security Key in iOS

Ithaca, NY

May 2017

- Developed an iOS app that utilizes the gyroscopic sensors present in iPhones to record motion data
- Designed a program that can compare motion data to check for similarity (compare password input to password on file) and unlock phone if data is similar enough

Animal Health Hackathon

Cornell University College of Veterinary Medicine, Entrepreneurship at Cornell

Team TransFur

Ithaca, NY

January 2017

- Designed a 3D printed manual assistance device for topical application of flea and tick medication in 24 hours
- Chosen as Top 10 Finalist out of 50 teams to present device to potential investors and industry representatives

SKILLS

Technical: Machine Learning. TensorFlow. Keras. Convolutional Neural Networks. SVMs. Python. Java. MATLAB. Swift. C. MIPS Assembly. iOS App Development. Analog/Mixed Signal Circuit Development. Analog/Mixed Signal Processing. MEMS Microfluidic Device Fabrication. Polymer Electrospinning. X-Ray Image Processing. microCT Image Processing. Microsoft Office Suite. Statistical Analysis. Biomaterial Fabrication. Mechanical Testing. Histology. Cell Viability Analysis. Sterile Cell Culture Techniques. Experimental Design. Spotfire. FLIR Research IR. Avizo Fire.

Languages: English (native), French (conversational fluency)

ACADEMIC TEACHING EXPERIENCE

Undergraduate Teaching Assistant

Ithaca, NY

BME 3310: Medical and Preclinical Imaging

January 2018-May 2018

Meinig School of Biomedical Engineering, Cornell University

- Co-designed hands-on laser speckle imaging lab
- Advised students on imaging modalities and image analysis, and held office hours.

Undergraduate Teaching Assistant

Ithaca, NY

BME 3030: Measurement and Instrumentation in Biomedical Engineering

August–December 2017

Meinig School of Biomedical Engineering, Cornell University

- Designed and taught a lecture on advanced biomedical data manipulation.
- Advised students on circuit design and experimental design during an instrumentation lab and held office hours.

Chemistry Tutor

Ithaca, NY

CHEM 1007: Academic Support for CHEM 2070

August 2017 – May 2018

Department of Chemistry, Cornell University

- Tutored underclassmen in introductory chemistry

LEADERSHIP AND ACADEMIC OUTREACH EXPERIENCE

March for Science, Youth Advocacy Summit Organizing Committee

Committee Member – Focus on Science Communication and Education

May 2018 - Present

- Organized science communication and science education sessions for students ages 13-25 interested in science/political advocacy

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Engineering Dean's Undergraduate Advisory Council

Council Member

Ithaca, NY

April 2017–May 2018

- Advised the Dean of the College of Engineering on future academic and student life improvements.

Biomedical Engineering Society, Undergraduate Chapter at Cornell

Co-Founder and Co-President

Ithaca, NY

May 2016–May 2018

As a member of the first class of Biomedical Engineering to graduate from Cornell, I felt that it was necessary to create an organization that represented the ideals and interests of my peers, and that gave us opportunities to improve ourselves through professional development and tutoring.

- Established the undergraduate chapter of the Biomedical Engineering Society in May 2016.
- Created a program that allows students to go into the Ithaca community to present their research, which will launch fall 2017.
- Handpicked 10 other students to form an executive board, advertised the organization, and managed many successful academic and social events for those interested in biomedical engineering.

Louis Stokes Alliance for Minority Participation (LSAMP) Scholars Program

Scholar

Ithaca, NY

August 2015–May 2018

- Attended regional LSAMP conferences to present research and network with other LSAMP scholars.

Engineering Ambassadors

Co-President (2017-18), Co-Vice President (2016-17)

Ithaca, NY

March 2015–May 2018

- Gave group tours of the engineering quad, participated in panels for the College of Engineering, had lunch with prospective students, corresponded with prospective and admitted students by email and phone throughout the application process, and occasionally gave one-on-one tours of the engineering quad or of the Bonassar Lab.
- Arranged social events for the ambassadors, worked closely with admissions staff, and lead the application and interview process for prospective new ambassadors.
- Collaborated with Diversity Programs in Engineering to increase interest in STEM fields in underrepresented minorities and women.

Splash! At Cornell

Course Instructor

Ithaca, NY

February 2015–May 2018

- Designed a lesson plan for and taught a course on current research in biomedical engineering every semester for three years.

Alpha Phi Omega, Gamma Chapter

Brother, Fellowship Co-Chair, Service Chair

Ithaca, NY

September 2015–May 2018

- Supervised and led service events, such as volunteering at the Ithaca Science Olympiad.
- Planned and organized fun and relaxing events for APO brothers, such as weekly Zumba classes.

Recreational Fencing Club

President (2017-18, 2016-17), Secretary (2015-16)

Ithaca, NY

September 2014–May 2018

- Taught new members the basics of fencing.
- Managed a multi-thousand dollar budget and membership dues.
- Planned travel to and participation in competitive events for interested members and arranged skill development workshops and clinics with nearby universities.

Alice Cook House, West Campus House System

Student Assistant

Ithaca, NY

August 2016–May 2017

- Acted as an academic, emotional, and mental health wellness resource for 80 residents.
- Planned social and academic events, such as a “Learn to Code” workshop series and a weekly athletic event for interested residents.

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HONORS AND AWARDS

2018 Project Showcase Competition, First Place in Design and Pitch *May 2018*
Meinig School of Biomedical Engineering, Cornell University

National Action Council for Minorities in Engineering (NACME) Scholarship *May 2017*
National Action Council for Minorities in Engineering, Cornell University Diversity Programs in Engineering

Undergraduate Excellence in Service Award *May 2017*
Cornell University Diversity Programs in Engineering

Animal Health Hackathon, 9th Place (Team TransFur) *January 2017*
Entrepreneurship at Cornell, Cornell University College of Veterinary Medicine

National Residence Hall Honorary Student of the Year *May 2016*
National Residence Hall Honorary, Cornell University Chapter

National Residence Hall Honorary Student of the Month *September 2015*
National Residence Hall Honorary, Cornell University Chapter