

MICHAEL WILKINSON

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PROFESSIONAL SUMMARY

- Skilled engineer with broad experience in the analysis and design of novel sensorimotor control systems.
- Possess expertise in control system identification techniques, neuroscience applications, and modeling of locomotor systems informed by multi-modal sensation.
- Established and led multiple cross-disciplinary collaborations at Johns Hopkins University and Medical Institutions to address specific research challenges in sensorimotor control in biological systems.

EDUCATION

D.Eng Johns Hopkins University, Mechanical Engineering	May 2024
M.S.E Johns Hopkins University, Robotics 3.74 GPA	May 2021
B.S.E. University of Alabama, Electrical Engineering 4.0 Overall GPA, 4.0 Major GPA Minor in Mathematics and Physics Graduated from Honors College	May 2019
H.S. Mentor High School, Mentor, Ohio 4.0 GPA, Class Rank: 8/666 President of Ecology Club and Anti-Suicide Club	May 2015

HONORS AND AWARDS

Distinguished Graduate Student Fellowship, JHU Kavli NDI Competitive graduate fellowship mid- and advanced stage graduate student trainees at Johns Hopkins University to pursue cross-disciplinary research in neuroscience, engineering, and data science.	May 2021
Honorable Mention, National Science Foundation GRFP Competitive nationwide graduate research fellowship program (GRFP); only 2076 awards and 1787 honorable mentions in 2020.	April 2020
JHU Mechanical Engineering Department Fellowship Full stipend and tuition fellowship for one year, granted to select PhD applicants in Mechanical Engineering each year.	July 2019 – July 2020
University of Alabama Capstone Engineering Society ECE Outstanding Senior Award, April 2019 Prestigious award given to only one outstanding senior by UA CES and ECE departmental staff each semester.	

ECE Undergrad Research Fellows

April 2018

Granted for two semesters of research under Dr. Aijun Song, University of Alabama ECE department, on Autonomous Kayaks for Naval Data Collection.

Presidential Scholarship

Fall 2016 – Spring 2019

Full tuition at the University of Alabama, awarded to me upon my sophomore year for my GPA, school involvement, and ACT scores.

President's List

Spring 2016 – Fall 2018

Awarded to those with a 4.0 GPA or above each semester, every semester from the Spring of 2016 to the Fall of 2019.

RESEARCH EXPERIENCE

CRCNS Bat Flight Control Project, Johns Hopkins University, Baltimore, MD

Jan. 2019 – present

Mechanical Engineering PhD Researcher, Advisor: Dr. Noah J. Cowan

- Investigating the somatosensory cortex neural activity of bats while under wind tunnel airflow to develop brain-in-the-loop control system of wing angle informed by neural activity, leading to applications for sensory based control schemes in aerial robotics.
- Developing a system that will allow for autonomous control of in-flight parameters, which will eventually be used for closed loop control of flight-parameters based only on neural recordings.
- Project is funded by the NSF Collaborative Research in Computation Neuroscience (CRCNS) program and is a collaboration with Dr. Cynthia Moss in Psychology and Brain Sciences.

NSF Human Cerebellar Control Project, Johns Hopkins University, Baltimore, MD

March. 2021– present

Mechanical Engineering PhD Researcher, Advisor: Dr. Noah J. Cowan

- Recording and analyzing VR target tracking data from patients with cerebellar ataxia and aged matched controls to model deficiencies caused by ataxia and create assistive technologies to combat deficiencies.
- Develop mathematical models of the feedforward and feedback control strategies used by patients and perform a comparative analysis to control models.
- Project is funded by the NSF and is a collaboration with Dr. Amy Bastian in the Kennedy Krieger Institute Center for Movement Studies

MURI Dome Project, Johns Hopkins University, Baltimore, MD July 2019 – Jan. 2020**Mechanical Engineering PhD Researcher**, Advisor: Dr. Noah J. Cowan

- Recorded neural activity from brain hippocampus (CA1 region) of rats while they were jumping to analyze brain representation of 3D space for navigational applications in locomotor robotics.
- Research design proposal based on this work awarded me an NSF GRFP Honorable Mention in April of 2020.
- Project was funded by the DoD Multidisciplinary University Research Initiative (MURI) and was a collaboration with Dr. James Knierim in Neuroscience.

R.E.U. Ionospheric Studies, University of Florida, Gainesville, FL May 2018-Aug. 2018
Undergrad Researcher, Advisor: Dr. Robert Moore

- Performed an analysis of ELF/VLF wave data generated by the High-frequency Active Auroral Research Program (HAARP) in order to map Ionospheric current densities for long distance communications applications.
- Research was funded through the National Science Foundation's (NSF) Research Experience for Undergraduates (R.E.U.) Program.

R.E.U. Autonomous Kayaks, University of Alabama, Tuscaloosa, AL Aug. 2017-May 2020
Mechanical Team Lead, Advisor: Dr. Aijun Song

- Assisted in the development of an automated kayak to be used for marine based sensing for applications such as weapons detection, biological sampling, etc.
- In Fall 2018 my research received funding through the NSF's R.E.U. program and I became an R.E.U. undergraduate researcher.

Electric Vehicle Emulator, University of Alabama, Tuscaloosa, AL Aug. 2018-May 2019
Senior Design Project Team Lead, Advisor: Dr. Mithat Kisacikoglu

- Directed and organize a team of peers in the creation of an Electric Vehicle (EV) Emulator capable of simulating the load behavior of a battery during high-power charging for EV charger and grid integration testing.
- Lead team in creating the power electronics circuit with active rectification and closed loop current control to simulate load power dissipation

Materials/Chemical Sensing, University of Alabama, Tuscaloosa, AL Jan. 2018-May 2019
Undergrad Researcher, Advisor: Dr. Adam Hauser

- Took careful measurements of designed materials exposed to water, DNT, and nitrobenzene to test the reactivity for use in military safety applications.

PRESENTATIONS/ PUBLICATIONS

D. Cao, **M. Wilkinson**, A. Bastian, N. Cowan, "Cerebellar Contribution to the Internal Model Control", *JHU Robotics: Industry Day 2022*, Virtual Presentation, Mar. 22, 2022

Y. Yang, **M. Wilkinson**, N. Cowan, L. Whitcomb, "Modeling Nonlinearities of Refuge Tracking in *Eigenmmania virescens*", *Society for Integrative and Comparative Biology (SICB) Conference*, Virtual Conference, Jan. 3-7th, 2021.

S. Lashkari, **M. Wilkinson**, B. Krishnan, J. Knierim, N. Cowan, "Decision-Making and Path Planning for Jumping Rats", *Dynamic Walking Conference*, Virtual Conference, May 14th, 2020.

M. Wilkinson, R. Moore, "Time of Arrival Analysis – Narrow versus Broad Beam Heating of Ionosphere", *American Geophysical Union (AGU) Conference*, Washington DC., December 10th – 14th, 2018.

M. Wilkinson, R. Moore, "Time of Arrival Analysis – Narrow versus Broad Beam Heating of Ionosphere", *Radio Frequency Ionospheric Interactions (RFII) Conference*, 25th Annual RF Ionospheric Interactions Workshop, Washington D.C., July 29th – August 2nd, 2018.

PROFESSIONAL TRAINING

Deshazo Automation/LLC., CO-OP, Electrical Engineering, Aug. 2016 – Aug. 2017

- Worked two full-time semesters at Deshazo programming industrial robots used to automate various industrial systems.
- Was one of the lead programmers on a project for the Amerex Corporation and spent several months designing and implementing the programs used for the automation of one of their processes.
- Had a major contribution to the Robotic Vision System that was created by Deshazo Automation that was able to recognize parts in a random bin using machine learning and image processing through the use of Halcon vision software and Visual Basic coding.

Sit Down Forklift Operator Certification, OSHA, July 17th, 2017

- Certified to operate sit down forklifts as regulated by OSHA standards.

COMPUTER SKILLS

Languages: Matlab, C/C++, R, Visual Basic, Assembly, Fanuc Robot Coding, Quartus

Softwares: Matlab, Simulink, SolidWorks, RStudio, AutoCad/AutoCad Electrical, PSpice, LTSpice, Halcon Vision Software

LEADERSHIP AND ADVOCACY

Graduate Representative Organization (GRO), Co-Chair, Johns Hopkins University, Feb. 2022 – Present

Manage and lead the largest (2000 students) graduate student organization at Johns Hopkins Homewood Campus. I serve as the primary liaisons between the GRO and University administration and all other University and non-University bodies or representatives, and many other organization specific roles.

Graduate Representative Organization (GRO), Treasurer, Johns Hopkins University, Feb. 2022 – May 2022

Graduate Representative Organization (GRO), Robotics MSE Departmental Representative, Johns Hopkins University, Sept. 2021 – Feb. 2022

Mechanical Engineering Graduate Association (MEGA), Social Events Co-Chair, Johns Hopkins University, Aug. 2021 – Present

Through MEGA, I help create and implement social events for the Mechanical Engineering department at Johns Hopkins University that help our undergrads, masters, doctoral, and post-doc students stay engaged with the department and one another as well as provide opportunities for stress relief.

Teachers and Researchers Union (TRU), Communications Team Co-Chair, Johns Hopkins University, Jan. 2021 – Present

TRU is the student worker union at Johns Hopkins University. Our goal is to ensure fair labor rights and practices for all of our students who are performing research at the university. I communicate important information to our members about opportunities for the union as we work towards official recognition by the university.

MentorUPP Program, Outreach Committee Chair and Alumni Mentor, University of Alabama, Aug. 2017-Present

Through the MentorUPP Program at the University of Alabama I was a mentor for three freshmen in the College of Engineering. I was also on the Advisory Board of MentorUPP that oversees all the aspects of MentorUPP such as activities, programs, communications, recruiting, etc. I am now an Alumni Mentor that provides mentorship to upper level students at the University of Alabama.

ECE Ambassador, College of Engineering, University of Alabama, Aug. 2018 – May 2019

COMMUNITY SERVICE

Charles Village Civic Association Charles Village in Baltimore, Maryland, July 2020 - present

Member of the neighborhood association for the Charles Village community in Baltimore City which addresses community concerns and hosts various programs such as community events, food and news distribution, educational programs, etc.

Donations and Work through Free and Accepted Masons and the Shriners

Rising Virtue Lodge #4 and Zamora Shrine, Tuscaloosa, Alabama, Sept. 7, 2017 - Present
Through the F&A Masons my dues are given to the many charities in which we donate such as foundations for learning disabilities, the Shriners Hospitals, etc.

Mission Trip to the Hanbury Home in Mandeville, Jamaica

Northport First United Method Church in Northport, Alabama, June 18, 2017 - June 27, 2018
I helped the Salvation Army Major in charge set up internet connection and computers, build a functioning playground, and install clotheslines for the workers at the orphanage.

REFERENCES

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