Micah Chandler DeLattre

Pennsylvania State University Engineering Graduate Student

School: mwd5376@psu.edu | Personal: delattremicah@gmail.com | Cell: (814)762-5250
https://www.linkedin.com/in/mdelattre/ | State College, PA 16801

Education

Graduate Student at Pennsylvania State University
M.S., Mechanical Engineering — Anticipated May 2025

Schreyer Honors College at Pennsylvania State University
B.S., Mechanical Engineering, Final Cumulative GPA: 4.0 — May 2023

Moshannon Valley Junior Senior High School | Houtzdale, PA
- Valedictorian — 2015-2019

Relevant Coursework

Machine Learning in Engineering, Technology and AI in Living Systems, Linear Systems Theory, Robotic Concepts, Engineering Mathematics, Applied Statistics, Automatic Control Systems, Modeling Dynamic Systems, Mechatronics, Circuit Instrumentation & Analysis, Vibrations of Mechanical Systems, Mechanical Design, Computational Tools, Programming for Engineers-C++

Distinctions & Awards

Schreyer Honors College Graduate	2023
Penn State's Evan Pugh Scholar Award Winner – Senior	Spring 2022 & Spring 2023
Penn State's President Sparks Award Winner	Spring 2021
Penn State's President Walker Award Winner	Spring 2020
Ready to Succeed Scholarship Recipient	Fall 2022-Spring 2023
Louis Harding Memorial Scholarship Recipient	Fall 2021-Spring 2023
George A. Miller Engineering Scholarship Recipient	Fall 2021-Spring 2023
Evelyn W. Cronister Memorial Scholarship Recipient	Fall 2019-Spring 2023
Wesley W. Harris Scholarship Recipient	Fall 2021-Spring 2022
Penn State Altoona Chancellor Award Recipient	Fall 2019- Spring 2020
G. Thelen Rail Transportation Engineering Scholarship Recipient	Fall 2019- Spring 2020

Academic Experiences

Etch-A-Sketch-Robotic Concepts Project — November- December 2023
- Assembled an automatic Etch-A-Sketch device controlled by an Arduino which sent motor commands from Arduino IDE to equipped DC motors to create complex drawings with high speed and precision
- Developed custom "drawing" algorithm in MATLAB which turned raw image into data packets sent serially to Arduino
- Integrated MATLAB GUI where users could upload and edit images to be printed on the Etch-A-Sketch

Connect 4-Robotic Concepts Project — October 2023
- Built and programmed a Connect 4 robot in CoppeliaSim with robotic placing arm, automatic chip reset system, and sensing architecture to check for game ending conditions
- Designed and implemented easy-to-use Connect 4 MATLAB GUI for users

UAV-Mechanical Engineering Systems Lab Project April 2023

• Programmed a differential drive robot, the Jetbot, to accomplish 6 learning objectives during this UAV lab
  - Learning objectives: Basic robot control, sign recognition, path following, robot networking & communication, path planning, camera calibration & position detection
• Ultimate goal: program the robot to travel between two locations autonomously using the shortest distance while following traffic signs placed on the road network
• Accomplished the goal while meeting all learning objectives and documented the work in a video journal

Machine Learning-Mechanical Engineering Systems Lab Project January 2023

• Utilized MATLAB Mobile to stream raw accelerometer data while preforming various day-to-day activities
• Incorporated statistical analysis principles into a trained classification model to try to predict the activities
• Achieved a model with 95% accuracy that successfully predicted all activities preformed from the raw data set

Introduction to Robotics Project November 2022

• Programmed a 6-axis robotic arm, the Braccio bot, to perform tasks like placing and/ or removing foam blocks from a tower, move to specific poses, etc.
• Utilized transformation matrix manipulation, forward, and inverse kinematics to control the movement of the robotic arm in the Arduino IDE

Discovery Space Design Project August 2022-December 2022

• Constructed a tabletop introduction-to-programming arcade machine featured at the Discovery Space
• Configured a Linux microcomputer to run *Scratch* which displayed on the machine's monitor
• Considered customer needs, concept generation, system decomposition, creating reports to document progress

Research Interests and Experiences

Biorobotics: Combination of principles from biology and robotics to create robotic systems that mimic or interact with living organisms.

Autonomous Intelligent Systems: Self-governing entities, which often leverage AI and machine learning techniques to make decisions and perform tasks without external control or intervention.

Mechatronics: Integration of mechanical engineering, electronics, computer science, and control systems to design and develop intelligent, electromechanical systems and products.

Pennsylvania State University, State College, PA

Graduate Researcher in the Biological & Robotic Intelligent Fluid Locomotion Lab

May 2023-Present

• Leading research and design of a buoyancy control device for the labs biomimetic robotic fish, 'MuBot'
  - This device allows autonomous depth-control of the robot enabling 3D locomotion
• Assisting with the integration of pressure sensing and feedback control capabilities on the MuBot
  - Enabling intelligent perception and control of the bot in its surrounding environment

Undergraduate Researcher with Intelligent Vehicles and Systems Group

September 2021-May 2023

• Lead implementation of off-road autonomous path-following capabilities in a 1/5th scale RC vehicle platform
  - Completed simulated autonomous path-following in a Simulink environment
  - Initiated algorithm development and integration to enable real-world autonomous path-following
• Completed mechanical and electrical hardware modifications to enable safe and repeatable off-road driving
  - Installed a wireless emergency stop unit and secure electronic packaging units on the car
• Designed and constructed an off-road test course to be used by the labs off-road vehicles

Publications

Undergraduate Research Thesis
DeLattre, M., 2023, "Off-Road Autonomous Path Following in an Instrumented Small-Scale Test Vehicle." https://honors.libraries.psu.edu/catalog/8521mwd5376

Work Experience

Pennsylvania State University, State College, PA
Summer Research Assistant- Mechanical Engineering May 2023-August 2023
• Began graduate school research in the Biological & Robotic Intelligent Fluid Locomotion Lab
• Conducted an extensive literature review and began work on the 'MuBot' project, a biomimetic robotic fish
• Collaborated with the lab's PI and grad students to begin work on a buoyancy control device for the MuBot

Aerotech, Inc., Pittsburgh, PA
Mechanical Engineering Intern May 2022-August 2022
• Researched, designed, and printed additive manufactured flexures utilizing an HP jet fusion 3D printer
• Simulated the flexural behavior in ANSYS to validate performance and applicability in Aerotech products
• Collaborated with full-time engineers and created a portfolio of my work for Aerotech employees to use

Activities & Involvement

- Mechanical Engineering Systems Lab Teaching Assistant — August 2023-Present
- Member of the Biological & Robotic Intelligent Fluid Locomotion Lab — May 2023-Present
- Harmony Club Member — September 2022- Present
- Member of the PSU Ultimate Frisbee Club team — September 2021- Present
- Member of the Intelligent Vehicles & Systems Research Group at PSU — September 2021- May 2023
- Scholar at The Penn State Schreyer Honors College — June 2021- May 2023
- Undergraduate Student Grader — September 2022-December 2022
- Employee at PSU Altoona's IT service desk — August 2019- August 2021
- Vice-president and founder of Ultimate Frisbee club at Penn State Altoona — August 2019- May 2021
- Penn State Altoona Honors Program member — August 2019- May 2021

Skills

MATLAB	Python	Arduino
C++	SOLIDWORKS	Additive Manufacturing
Robotics & Sensing	Circuitry & Soldering	PCB Fabrication
CoppeliaSim	Linux	Simulink
GitHub	Minitab	LabVIEW
SEM & Microscopy	ANSYS	AutoCAD