Henry Buron

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Education

Northwestern University | McCormick School of Engineering **Sep. 2023 – Dec. 2024 (Expected)**
M.S. in Robotics *Evanston, IL*

- **Portfolio**: henryburon.github.io

William & Mary **Sep. 2019 – May 2023**
B.S. in Engineering Physics, Cum Laude *Williamsburg, VA*

- Capstone Project: Unmanned Electric Race Boat

Relevant Coursework

- Embedded Systems in Robotics, SLAM for Robotics, Machine Learning, Robotic Manipulation, Theory of Machines–Dynamics, Mechatronics, Classical Mechanics, Ordinary Differential Equations, Linear Algebra

Projects

Polyglotbot: A 7 DoF Robot Arm that Writes Translated Text and Speech | *ROS2, MoveIt!, RViz* **Fall 2023**

- Co-developed a ROS2 package for a Franka Emika robot arm that plans and executes cartesian paths.
- Created a custom Python API for the ROS2 MoveIt! package to control the robot arm's motion.
- Primary responsibilities included working with the AprilTags, TF tree, speech-to-text functionality, and MoveIt!.

Machine Learning Emotion Classification | *Python, Image Processing, Feature Extraction* **Fall 2023**

- Developed a robust machine learning pipeline for emotion classification in facial images, achieving up to 77% accuracy.
- Employed Histogram of Oriented Gradients (HOG) feature extraction to capture subtle changes and edges.

KUKA youBot Mobile Manipulation | *Robotic Manipulation, Python, CoppeliaSim* **Fall 2023**

- Created a Python-based automation for the KUKA youBot, enabling autonomous trajectory planning and object manipulation in CoppeliaSim.
- Achieved precise object manipulation with a well-tuned PI controller; rapid error convergence in simulation.

Computer Vision-Controlled Robot Arm | *Computer Vision, Python, Image Processing* **Sep. 2023**

- Designed a pipeline using computer vision and inverse kinematics to detect, localize, and grasp a purple pen with the PincherX 100 robot arm.
- Utilized RGB image segmentation, depth map alignment, and coordinate transformation to guide the end-effector.

Unmanned Electric Race Boat | *ArduPilot, Electronics, Autonomous Systems* **Sep. 2022 - May 2023**

- Led team in building electric catamaran from scratch, earning 3rd place in the competition's Unmanned Division.
- Primarily responsible for ArduPilot integration and electric propulsion systems, enabling autonomous navigation.

Experience

Baltimore Aircoil Company **May 2022 – August 2022**
Mechanical Design Engineer Intern *Jessup, MD*

- Collaborated with engineers to design intricate sheet metal parts for manufacturing in Autodesk Inventor.
- Enhanced sheet metal design consistency and reduced errors through my expertise in automated updates using parametric models.

William & Mary Makerspace **Sep. 2021 – May 2023**
Senior Makerspace Student Engineer *Williamsburg, VA*

- Operated and managed the Makerspace's 3D printing, design, and manufacturing services for students and faculty during their research and development process.
- Led workshops on 3D printing, CNC machining, laser cutting, and building FPV drones from scratch.

Skills

Software: Python, C++, Linux, Git/GitHub, Jupyter Notebook
Robotics: ROS/ROS2, SLAM, Machine Learning, OpenCV, MoveIt!, Nav2, Gazebo, CoppeliaSim, ArduPilot
Hardware: Electronics, Circuit Design, Microcontrollers, CNC, 3D Printing, Rapid Prototyping
Language: Spanish (Maryland Seal of Biliteracy)