Allan Garcia-casal

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EDUCATION

Northwestern University **Evanston, IL**
M.S. in *Robotics - GPA: 3.93/4.00* Expected Graduation: Dec 2023

Completed Courses: Sensing, Navigation, and Machine Learning for Robotics (SLAM) in C++, Embedded Systems with ROS2, Robotic Manipulation, Machine Learning

Boston University **Boston, MA**
B.S. in *Biomedical Engineering* *Sep 2018 - May 2022*

AWARDS: Hispanic Scholarship Fund Scholar 2021

WORK EXPERIENCE

Brigham and Women's Hospital, Department of Radiology **Boston, MA**
Image Guided Surgery Research Intern *Jun 2021 - Aug 2021*

- Optimized the registration of 3D meshes from MRI and CT scans
- Used Python point-cloud libraries for image segmentation and registration methods testing
- Created different 3D point-cloud meshes for testing using MeshLab

SELECT PROJECTS

Adroit Robotic Arm sEMG Teleoperation *Winter 2023*

- Developed software in Python and ROS that allows for control of an Adroit Robotic Arm using a Myo Gesture Armband
- Integrated a PyTorch model that used sEMG readings for gesture recognition and classification
- Mapped the gestures to control the end effector and the armband IMU data to control other joints

Simultaneous Localization and Mapping (SLAM) from Scratch *Winter 2023*

- Implemented an Extended Kalman Filter for SLAM on a Turtlebot3 using ROS 2 and C++

Franka Robotic Arm Motion Planning *Fall 2022*

- Developed software in Python and ROS2 that allows a 7 DOF robot arm to autonomously prepare a cup of hot chocolate
- Integrated the MoveIt package into a ROS2 motion planning API in Python that was used to interface with the robotic arm

Robotic Arm Pen Tracker *Fall 2022*

- Used an Intel RealSense camera to detect a pen and then had a px100 robotic arm grab it
- Implemented an object detection algorithm for the pen using the OpenCV Python library

MRI Compatible EEG Layer Design *Fall 2021, Spring 2022*

- Designed MRI compatible EEG cap layer that helps attenuate noise from EEG/MRI readings
- Developed several cap designs using different insulating fabrics and conductive inks
- **Submitted for Publication:** Levitt, Yang, Williams, Lutschg, Garcia-Casal, Lewis, "EEG-LLAMAS: an open source, low latency, EEG-fMRI neurofeedback platform"

Pulse Oximeter Prototype *Spring 2021*

- Designed a prototype pulse oximeter with CAD
- Designed and integrated analog filters with an Arduino board for accurate signal collection and processing
- Integrated the circuitry into the modeled CAD housing

LEADERSHIP EXPERIENCE

BU Technology Innovation Scholars Program (TISP) **Boston, MA**
FIRST Robotics Engineering Mentor *Sep 2019 - May 2022*

SKILLS

Software: ROS2/ROS, Git, Linux, Blender, SolidWorks, Gazebo, PyTorch
Programming: Python, C++, C, MATLAB, Machine Learning
Hardware: Circuit Design, Materials Testing