

# Daniel DeBord

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Portfolio: <https://ddebord3.github.io/>

## EDUCATION

Georgia Institute of Technology, College of Engineering Atlanta, Georgia  
*Master of Science in Electrical and Computer Engineering* May 2020

- GPA: 4.0

Georgia Institute of Technology, College of Engineering Atlanta, Georgia  
*Bachelor of Science in Computer Engineering, Minor in Aerospace Engineering* May 2019

- GPA: 3.95

## EXPERIENCE

Software Engineering Co-op January 2018 – August 2018  
L3Harris ISR Systems Greenville Greenville, Texas

- Programmed a socket-based IO system in C to continuously read bytes sent between a device and its controller
- Analyzed byte messages from a system in response to inputs to simulate the system with future software
- Engineered a C program to simulate and replace the control unit of a communications device
- Developed and implemented test procedures for new hardware
- Joined peer reviews to assess the efficacy of new test procedures and their observance of company standards

## PROJECTS

Normalizing Flow Evaluations March 2020 – April 2020

- Collaborated with other students to implement four different “normalizing flow” density estimation techniques
- Designed new PyTorch code for loading, creating, and managing new datasets
- Identified strengths and limitations per approach by evaluating performance across multiple datasets
- Described usage scenarios where different methods would be preferable to alternatives in a formal report

Robotarium Project October 2019 – November 2019

- Developed successful obstacle avoidance controls for a collection of autonomous “bird-oid” objects
- Executed practical tests of new control schemes for a set of custom model robots using MATLAB
- Optimized the system for smoother operation in the Georgia Tech Robotarium

Undersea Robotic Predator December 2018 – April 2019

- Collaborated with students to program an aquatic robot to autonomously find sea urchins in their environment
- Developed Python software using ROS to apply a neural network to the camera feed of a VideoRay Pro 4 robot
- Researched, implemented, and tested the YOLOv3 algorithm for real-time object detection of custom objects
- Trained new weights for the system using the Darknet neural network framework and custom labeled images
- Automated the process of converting labeled images from native CVAT output into usable formats
- Managed software dependencies across subsystems through the use of virtual machines

Vertically Integrated Projects Program: TerraBots January 2016 - December 2018

- Worked with a team to resolve specific problems in planning a construction robot’s likely path
- Created a functional proof of concept for a set of robots moving in a populated worksite
- Implemented multiple pathfinding methods, including a fast-marching approach, to maneuver a worksite
- Incorporated the kinematic constraints of various types of robots into the planned movement of a robot
- Used a frontier exploration-based approach to perform simultaneous localization and mapping (SLAM)
- Led new students and taught them how to properly use previously developed code

## SKILLS

**Programming Languages:** Python, Java, C, C++, Assembly, MATLAB

**Computer Vision:** Artificial Neural Networks, Image Processing with PDEs, Real-time Custom Object Detection, PyTorch

**Robotics:** Motion Planning, Robot Operating System (ROS), Simultaneous Localization and Mapping, Swarm Robotics