FIONA GILLESPIE

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EDUCATION

Massachusetts Institute of Technology   **Class of 2024**
- Candidate for Master's Degree in Electrical Engineering and Computer Science (Present)   *Cambridge, MA*
- B.S. Electrical Engineering and Computer Science with Minor in Mechanical Engineering (2023)
- GPA: 5.0
- *Relevant Courses:* Dynamics and Controls I and II (2.003, 2.004), Visual Navigation for Autonomous Vehicles (16.485), Robotics: Science and Systems (16.405/6.4200), Robotic Manipulation (6.4212), Underactuated Robotics (6.832)
- Teaching Assistant for Dynamical System Modeling and Control Design (6.310)

PUBLICATIONS

- Daniel Klahn, Fiona Gillespie, et al. Oyster farming by autonomous surface vehicles : An implementation of control and perception systems. In *OCEANS 2023 - Limerick*, 2023
- Fiona Gillespie, Kassidy Peterson, et al. Aquabot: An open-ocean aquaculture feeding vessel proof-of-concept. In *OCEANS 2022, Hampton Roads*, 2022

EXPERIENCE

MIT Sea Grant, *Perception and Controls Researcher*   **September 2021 - Present**
- Developing a ROS2 system for Oystermaran: Sea Grant's oyster-basket flipping boat
  - *Thesis:* Creating a feature matching-based perception system to robustly detect and track oyster baskets for state estimation and navigation; developing controls for autonomous basket flipping and position control of the boat
  - Mentoring two undergraduate researchers on the simulation and electronics systems
- Co-created a proof-of-concept ASV to simplify feed resupply to open-ocean aquaculture pens (Oceans 2022)
  - Developed controls system for autonomous docking via April Tags and radio control of other systems
  - Co-designed a simplified feed hose attachment from ASV to central mooring between pens

INESC TEC (University of Porto), *Research Intern*   **June 2023 - August 2023**
- Created vision-based localization system with 20m range for Raspberry Pi 3, Pi HQ camera, and 0.5m ArUco markers
- Worked with LiDAR to provide obstacle detection and mapping

Amazon Robotics, *Software Engineering Intern*   **June 2021 - August 2021**
- Designed and implemented a self-service tool for data producers to publish data cross-account to multiple consumers
- Created dashboards to visualize data flow and incorporated customer feedback to improve the tool for data producers

Neocis, *Controls Software Engineering Intern*   **February 2021 - April 2021**
- Designed and implemented a C++ algorithm to correct for sensor drift over time to reduce manual rebiasing
- Researched sensor drift accumulation and developed a drift simulation to test the drift correction algorithm

MathWorks, *Software Engineering Intern*   **June 2020 - August 2020**
- Worked on the Install and Licensing Team in Agile framework to implement activation client calls in C++
- Refactored C++ unit tests to reduce length by 70% (5,500 lines to under 1,700 lines)
- Created design documentation for a validation process to determine if there is sufficient space before a download/install

Global Teaching Labs Italy, *Teacher*   **January 2020**
- Designed lessons and taught 150 high school students (6 classes) coding and robotics for three weeks in Northern Italy
- Coding: taught students Scratch and helped them program Pong, Frogger, Flappy Bird, and an escape room
- Robotics: taught students to program LEGO Mindstorm robots to autonomously solve mazes with dead reckoning

MIT Game Lab, *Programmer on CLEVR (VR research project)*   **May 2019 - Oct 2019**
- Programmer on Unity VR educational game that immerses high school biology students in a cell
  - Wrote HLSL shader to animate organelles and mimic Brownian motion for proteins
  - Wrote C# script to optimally place 2,000 ribosomes on ER and 5,000 channel proteins on cell membrane

Personal Project: Boggle, *Software Developer*   **May 2020**
- Implemented a solver for the board game Boggle in Java using a depth-first search optimized by checking prefixes
- Demo and more info: fionagillespie.com/boggleDemo.html

SKILLS

Technical   *Advanced*: ROS2, ROS1, Java, Python, C++, Raspberry Pi, Arduino, Git
              Intermediate: LiDAR, Docker, LaTeX
              Beginner: Processing, HTML, CSS