

Isha Goyal

igoyal@olin.edu

Mechatronics Engineering Student

650-561-2992

February 15, 2024

<https://isha-goyal.super.site/>

Dear Hiring Manager,

I've been fascinated with the ocean since I learned to scuba dive several years ago through a shark conservation program. My continued curiosity brings me to the MBARI Internship. I'm a junior at Olin College of Engineering majoring in Mechatronics—a fusion between mechanical and robotics engineering. My focuses are on mechanical design (CAD), robotics, and human-centered design. I'm looking to develop more experience with the integration and sensing aspects of robotics in particular.

My extensive hands-on experience and collaborative mindset set me apart. This past summer, I worked for Kyaro Assistive tech in Arusha, Tanzania. My team designed and built a postural support seat for children with muscular control disabilities. We worked directly with a wide range of stakeholders including occupational therapists, parents, and technicians. Despite language and cultural barriers, we conducted weekly user tests with children, made friends, and produced a strong medical device. This experience not only improved my design and rapid prototyping skills but also enhanced my ability to communicate effectively within diverse teams.

The Autonomous Coastal Profiling Float project with Gene Massion presents an exciting challenge that aligns well with my background. My personal project to design a 3D printer in Solidworks allowed me to practice detail-oriented design and CAD of complex mechanisms. My mechanical experience positions me well to tackle the complexities of adapting the float to harsh coastal environments.

I'm also interested in the Scalable Marine Robotics project with Giancarlo Troni. I've worked on robot localization with a particle filter as well as a project where we controlled a fleet of robots with a livestream of our movements through a computer vision pipeline. These tools felt powerful, and I'm interested in developing my experience with sensing and computer vision further.

I've taken a wide range of courses to build a holistic knowledge, including Software Design, Engineering Systems Analysis, Solid Mechanics, Dynamics, Principles of Integrated Engineering, and Computational Robotics. I have a strong academic record as a straight-A student throughout high school and college, but more importantly, I bring positive energy and determination to face challenges head-on.

Beyond technical proficiency, I am driven by a desire to make a positive impact. I am upset by the frequent misuse of oceanic engineering for warfare, and I am committed to contributing to projects that advance collective knowledge instead. My ability to communicate effectively, work collaboratively, and adapt quickly would make me a valuable addition to your team.

Thank you for your consideration! You can contact me at igoyal@olin.edu or 650-561-2992.

Best,
Isha Goyal

Isha Goyal

Available for Summer 2024 Internships

(650)-561-2992 | igoyal@olin.edu | isha-goyal.super.site

Education

Olin College of Engineering, Needham MA - *B.S. in Mechatronics Engineering*

May 2025

- Some relevant coursework: Neurotech., Brains, and Machines (Machine Learning); A Computational Intro to Robotics; Mechanics of Solids and Structures; Engineering Systems Analysis: Dynamics; Software Design; Principles of Integrated Engineering; Biomimicry; Global Environmental Activism

Henry M. Gunn High School, Palo Alto CA - *GPA: 4.325/4.000*

June 2021

Skills

Software: SOLIDWORKS, Onshape, Python, MATLAB, ROS 2, QGIS, and Arduino

Fabrication: Prototyping Tools (e.g. 3D printers, Laser Cutters), Hand Tools (e.g. Belt Sander, Drill Press, Bandsaw), Metal Shop (e.g. Mill, CNC Router, Lathe), Woodshop Tools (e.g. Table Saw, Planar, Router)

Experience

Kyaro Assistive Tech, Arusha Tanzania - *Mechanical Engineering Intern*

May - August 2023

- Designed a postural support seat for children with disabilities in Tanzania; worked with multiple stakeholders including physical therapists, parents, and folks at relevant NGOs
- Streamlined the manufacturing process to work within the local constraints
- Tested with users to achieve a clean prototype that was cost-effective, locally manufacturable, easy to transport in the local context, easy for families to use, and culturally appropriate

Olin Machine Shop - *Shop Assistant*

April 2022 - Present

- Train students to safely use bandsaw, drill press, belt sander, manual mill, and manual lathe
- Maintain machine shop spaces

Zipline, South San Francisco CA - *Delivery Accuracy Team (Contractor)*

June - August 2021

- Worked to make package landing more accurate and reliable at electric drone company that delivers medical supplies
- Prototyped and tested different parachute and box designs using a test rig that dropped packages
- Analyzed data using tracking software to look at landing position and trajectory to inform testing

Projects

- **3D Printer Personal Project:** Learned about and designed a 3D printer from scratch in Solidworks.
- **Music Visualizer:** Used Python to take audio files, analyze their frequencies, and create visualizations to illustrate with a record-player-esque robot.
- **Self-Balancing Robot:** Used Matlab and Arduino to implement a 3 layer Proportional-Integral-Derivative control loop to balance an inverted pendulum robot.
- **Dancing Robots:** Controlled a fleet of 5 robots to drive based on the locations of key points from a live stream of a person moving with an OpenCV pipeline, ROS 2, and vacuuming robots..

January 25, 2024

Dear colleagues,

I am writing to offer my highest praise for Isha Goyal. I met Isha in the fall of 2021 when she was enrolled in my Quantitative Engineering Analysis 1 (QEA1) course in her first semester at Olin, and I was fortunate to get to know her better as a student in my Neurotechnology, Brains and Machines (Neurotech) course in the fall of 2023. Isha is an incredible student with a deep sense of curiosity and care, and a strong engineering competence. It has been a pleasure to watch her grow through her time at Olin, and I'm confident that she will use her skills to make the world better.

Olin provides students with extensive hands-on learning experiences, opportunities to present their work, and ownership of their educational decisions (with guidance from faculty). Through my many years of working with undergraduates, I have found that most Olin students are especially notable in their abilities to collaborate effectively and to jump into a new project and teach themselves the necessary skills. Isha certainly fits this description and has grown these abilities through her time at Olin, having worked on numerous individual and team projects.

Isha is the kind of student who, when you see her on the class roster, you immediately feel a little better about how the class will go. She brings a level of engagement, curiosity, and passion for making the world better that permeates the entire classroom. Isha loves the outdoors, and she can frequently be seen eating lunch outside or climbing one of the trees on campus. When assigning project partners in Neurotech, I intentionally paired Isha with one of the students from another college, because I knew that Isha would make sure that the student felt included in the work and had a good experience.

Isha also consistently produces solid technical work and frequently asks questions to make sure that she understands the material. She is not the type of student who does things just to check the box. In QEA1, Isha learned fundamental concepts of linear algebra by working to understand facial recognition algorithms (specifically the eigenfaces algorithm). She completed a series of homework assignments that introduce concepts such as matrix multiplication, principal component analysis, and eigenvectors. She also wrote code in MATLAB to apply these concepts and analyze real data and did a final project on optical character recognition. In this class, Isha also spent time considering algorithmic bias and the role of engineers in making the world a better place, a theme that has persisted in her work and thinking throughout her time at Olin.

In Neurotech, Isha developed more skills in machine learning, while also learning about emerging neurotechnologies and contemplating their ethical and societal implications. Isha and her partner completed a project in which they predicted which hand gesture a person was making based on the electromyography signals from their arm by using signal processing and machine learning. They assessed their algorithm in relation to current prosthetic technology and considered the effects of different types of mistakes that the algorithm could make. Isha brought

in thoughtful connections between this class and the time that she spent working on assistive technologies in Tanzania.

Overall, Isha Goyal is an amazing student who connects engineering and a care for humanity and the earth in a way that is highly notable for someone her age. She is a great team member and enjoyable person to work with, who can both get things done and consider the big picture. I strongly recommend her without reservation!

Sincerely,



Dr. Sam Michalka
Associate Professor
Computational Neuroscience and Engineering
Franklin W. Olin College of Engineering