Ronak Roy

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Education

Massachusetts Institute of Technology (MIT) | *Cambridge, MA*

Master of Science in Mechanical Engineering (expected) June 2025

Bachelor of Science with double major in Mechanical and Electrical Engineering (GPA 5.0/5.0) June 2023

Relevant Coursework: Robotics, Bio-inspired Robotics, Underactuated Robotics, Controls, Dynamics, Mechanics & Materials, Design & Manufacturing, Fluids & Thermodynamics, Measurement & Instrumentation, Numerical Computation, Differential Equations, Electromagnetic Fields & Forces, Machine Learning, Circuits & Electronics, Algorithms, Discrete Math

Industry Experience

Apple | *Cupertino, CA*

Prototyping Hardware Engineering Intern Jun 2023—Sep 2023

Tesla | *Palo Alto, CA*

Mechanical Design Engineering Intern: Power Electronics May 2022—Aug 2022

- Designed, simulated, and tested custom electromagnetic components, high-voltage connectors, and thermal management hardware for next-generation high voltage power conversion systems used in residential energy storage applications. Performed mechanical design, DFM, GD&T, analysis in ANSYS, electromechanical tests, and process development.

Eli Lilly and Company | *Indianapolis, IN*

Engineering Intern: Robotics and Manufacturing Jun 2021—Aug 2021

- Automated construction of assembly line monitoring system for Trulicity autoinjector, developed a warehouse robotics automation strategy, and designed prototype labware for robotic transportation, inspection, and storage of samples.

Research Experience

MIT Mechatronics Research Laboratory | *Cambridge, MA*

Undergraduate Researcher: Rotation-enabled Multi-tip Active Probe Atomic Force Microscopy Feb 2022—May 2023

- Designed and integrated electromechanical hardware for a system that uses piezoelectric actuators and motors to control position and rotation of samples with sub-micron precision for microscopy. Characterized sensors and actuators.

MIT Aerospace Controls Laboratory | *Cambridge, MA*

Undergraduate Researcher: Robot Perception and Collaborative Mapping Jun 2020—May 2021

- Built a multi-modality feature extraction system for robot perception applications in ROS. Wrote robotic perception software/algorithms in Python that fuses sensor data (RGB, LIDAR, IMU) and maps environments.

MIT Space Telecommunications, Astronomy, and Radiation Laboratory | *Cambridge, MA* Apr 2020—Sep 2020

Undergraduate Researcher: CubeSat Foldable Actuation System Test Engineering

- Designed a 3D-printed mechanical test setup in Solidworks and wrote Arduino scripts for characterization and failure testing.

Extracurricular Activities

Pappalardo Apprenticeship | *Cambridge, MA* Feb—May 2022, 2023

- Machine Shop TA in the design and manufacturing teaching lab. Taught sophomore students to design and fabricate semester-long robot project. Designed in Solidworks and fabricated (with mill, lathe, and waterjet) a Stirling Engine. Designed, machined positive, and post-processed (machining, grinding, scraping) cast iron Camelback straightedge.

MIT Solar Electric Vehicle Team | *Cambridge, MA* Oct 2019—May 2022

- Head of Suspension Design for 2024 vehicle. Extensively used Solidworks CAD and FEA to design/analyze suspension components for CNC machining and waterjet cutting. Developed MATLAB dynamic/geometric analysis tools. Responsible Engineer for back suspension and wheel package for 2020 vehicle. Fabricated and assembled parts of many subsystems.

6.a01 Lab Assistant | *Cambridge, MA* Sep—Dec 2020, 2021

- Taught electronics and rapid prototyping techniques to build electromechanical magnetics projects, including a brushless DC motor. Extensive work optimizing parts designs for 3D printing and laser cutting.

Skills

Mechanical Design and Fabrication: CAD (CATIA, Solidworks, Inventor, Fusion 360), FEA (ANSYS, Solidworks Simulation), CAM (Autodesk HSMWorks), PLM (3DX ENOVIA), DFM, Engineering Drawings, GD&T, CNC Machining (Milling Machine, Lathe, Waterjet Cutter), Rapid Prototyping (3D Printing, Laser Cutting), Workshop Tools (Drill/Driver, Miter Saw, Jig Saw, Band Saw, Table Saw, Grinding Wheel, Belt Sander)

Electronics/Embedded Systems: Arduino, Raspberry Pi, ESP-IDF, Breadboarding, Soldering, NI Multisim, Electronics Debugging (Function Generator, Oscilloscope, Lock-In Amplifier, DC/AC Power Supplies, Digital Multimeter)

Programming Languages: MATLAB, Python, LabVIEW, C/C++, Java, HTML/CSS/JavaScript, Swift, Objective-C, C#

Software Development: ROS, Drake, Numpy, PyTorch, bash/zsh, UNIX/Linux, Docker, RTOS

IDEs: Visual Studio Code, Eclipse, IntelliJ IDEA, PyCharm, Xcode

Office/Creative Software: Microsoft Office, Adobe Creative Cloud (Illustrator, Photoshop, Premiere Pro, InDesign)