URBASHI SANYAL

Mechanical Engineer | urbashisanyal25@gmail.com

Education

Hofstra University - Bachelor of Science in Mechanical Engineering, Minor in Mathematics. December 2025
Dean's List: Fall 2024, Spring 2025

Experience

Mechanical Engineering Intern, Flexbar Machine Corporation - Islandia, New York Dec 2023 - Jan 2024

- Reconstructed and updated engineering documentation for an optical gauging system by reverse-engineering assemblies from incomplete legacy prints and physical hardware
- Created and revised detailed part drawings and top-level assembly prints, verifying dimensions and tolerances for a system comprising 120+ components, many with decades-old documentation
- Applied GD&T and tolerance review to validate fit, alignment, and manufacturability of existing and purchased components
- Coordinated with the product manager, engineers, and suppliers to document specifications for legacy and off-the-shelf components
- Independently organized and executed documentation updates under a constrained winter timeline, advancing the project to near completion by internship end

Projects

Two-Link Robotic Arm Control System

- Designed and built a two-link planar robotic arm using brushed DC motors and aluminum links, prioritizing structural stiffness and sub-degree positional accuracy
- Developed a closed-loop joint position controller using encoder feedback and PWM motor control to accurately track commanded joint trajectories
- Implemented interrupt-driven quadrature encoder decoding to measure joint angles and direction with real-time responsiveness
- Modeled robot kinematics and joint motion in Simscape Multibody to verify alignment and debug mechanical assembly prior to hardware testing
- Generated and executed joint-space reference trajectories, including square-path motion, and validated system behavior through simulation and physical testing
- Integrated mixed-voltage power and signal systems for motors, logic, and sensors, debugging wiring and grounding to ensure reliable operation
- Documented modeling, control design, hardware integration, and experimental validation in a formal engineering design notebook following ABET-aligned practices

Magnetic Levitation System

- Designed and tested a magnetic levitation system using infrared sensing and electromagnetic actuation for real-time position control
- Modeled nonlinear levitation dynamics and developed a PID controller in MATLAB/Simulink to maintain ball position within 2 mm of the target
- Implemented sensor feedback and control logic on an Arduino microcontroller and validated system response using oscilloscope measurements

Skills

Control & Modeling: MATLAB, Simulink, Simscape
Mechanical Design: SolidWorks, Siemens NX, AutoCAD, GD&T
Hardware & Instrumentation: DC Motors, Encoders, H-Bridge Drivers, Sensors, Oscilloscope, Multimeter

Affiliation

Society of Women Engineers (SWE)
American Society of Mechanical Engineers (ASME)