

Rushav Dash

Robotics & Mechatronics Engineer · Autonomy Software · Mechanical Design · Physical Prototyping

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EDUCATION

M.S. Technology Innovation (Robotics) · University of Washington, Global Innovation Exchange · Bellevue, WA Sep 2025 – Mar 2027 (expected)

B.S. Mechanical Engineering · University of Washington · Seattle, WA Sep 2021 – Jun 2025

EXPERIENCE

Production Tech Intern

Jun 2026 – Present

OneCourt · Seattle, WA

- Designed tactile overlays for a 100-unit production run of a haptic sports device (material selection, surface features, per-sport logo treatment), iterated against feel and durability.
- Built a vibration test bench producing 3D heat maps of vibration propagation through production hardware; authored PCB packaging procedures and device-validation documentation.
- Assembled production units including 128-motor array soldering; refurbished 8 retired devices into a demo fleet and wrote battery/charger spec sheets with a supplier partner.

Prototype Lab Assistant

Dec 2025 – Present

Global Innovation Exchange, University of Washington · Bellevue, WA

- Beta-tested the full robotics lab curriculum (SLAM, LiDAR obstacle avoidance, YOLO detection, sensor fusion, waypoint navigation) on hardware for 70+ graduate students, surfacing integration failures and documentation gaps before the cohort ran.
- Designed custom tooling and fixtures that improved part consistency; support students on FDM/SLA printing, PCB cutting, and design for manufacturability.

R&D Engineering Intern

Summers 2023 & 2024

Zap Energy · Everett, WA

- Designed a ± 10 -micron precision fuel injection system for fusion reactor prototypes in SolidWorks with GD&T, validated by thermal-expansion FEA at 200 °C and optimized for 5-axis CNC through design reviews with machine shops.
- Built an Arduino-controlled thermal cycling system holding ± 0.5 °C at 250 °C using closed-loop PID and solid-state relays on a custom PCB with hardware safety interlocks.

Research Assistant

Apr 2024 – Aug 2024

Posner Research Group, University of Washington · Seattle, WA

- Fabricated a biomimetic tactile finger with strain-gauge arrays via multi-layer Dragon Skin silicone molding at 6-micron layer precision; achieved 2-micron repeatability and 0.1 N force resolution through iterative FEA and calibrated strain-to-force signal processing.

PROJECTS

Project Roost: Bio-Inspired Autonomous Perching Drone

Aug 2026 – Apr 2027 · In progress

GLX Capstone (student-led) · Project lead, team of 4

- Pitched and won approval for a student-led capstone building a quadcopter that perches autonomously on infrastructure (poles, branches, rails) using bird-inspired legs and onboard-only sensing; assembled the team and defined the six-phase plan.
- Leading mechanical design of an elastic slow-charge / rapid-release perching leg (worm-gearmotor spring winding, two-pawl offset ratchet, Dynamixel hip) in parametric CAD on a Holybro X500 V2 / Pixhawk 6C / Raspberry Pi 5 / RealSense D435i platform.
- Built PANOPTES, an open-source Linux motion-capture pipeline on OptiTrack Prime 13W cameras used as ground truth only: hardware-synced 120 Hz capture across 4 cameras, intrinsic calibration at 0.32–0.39 px RMS, bundle-adjusted extrinsics at 0.45 px RMS.

Intrinsic AI Challenge: Autonomous Fiber-Optic Connector Insertion (UR5e, Gazebo)

Mar 2026 – May 2026

Solo entry · github.com/rushav/aic-workspace

- Built the full perception-and-control stack solo over 10 weeks for a simulated UR5e inserting SFP and SC connectors into ports randomized in position, orientation, and layout with no ground-truth poses.
- Trained four per-port ResNet-18 regressors with ray-plane back-projection for pose estimation; commanded Cartesian setpoints to an impedance controller with force-gated descent (5/10/12/22 N) and stiffness modulation.
- Collected 530 teleoperated demonstrations and trained an ACT policy (LeRobot); shipped the classical pipeline after it outscored the learned policy 123 to 50. Portal score 41 → 123 across 46+ Docker builds.

VitreaClear: Non-Invasive Ultrasound System for Eye Floaters

2025

B.S. Capstone · Project lead, team of 4 · Patent pending, externally funded

- Led transducer system design and closed-loop acoustic power control; characterized beam profiles and optimized focal geometry through iterative water-bath testing to keep the therapeutic zone within the vitreous chamber.

Drunky: Bimanual Vision-Servo Robot Bartender (SO-101)

Spring 2026

Team of 3 · Teammate-owned repo

- Owned system orchestration, the wrist-camera YOLO detector, and the visual-servo alignment loop for two 5-DoF arms; validated across a 480-trial grid at 62.7% success (71.7% top shelf vs 53.8% bottom), isolating approach angle and occlusion as the dominant failure driver.

TECHNICAL SKILLS

Robotics & Autonomy	ROS 2 (Humble, Jazzy, Kilted), PX4, SLAM (slam_toolbox), LiDAR, Sensor Fusion, Visual Servoing, Impedance Control, PID, MoveIt 2, Gazebo, tf2
ML & Perception	PyTorch, CNNs (ResNet-18), Transformers (ACT), Imitation Learning (LeRobot), YOLOv8/v11, OpenCV, Camera Calibration, Signal Processing
Programming & Infra	Python (production), C++ (working), MATLAB, Bash, Docker, Linux, Git, systemd, FastAPI
Mechanical & Fabrication	SolidWorks, CadQuery, GD&T, Thermal & Structural FEA, Tolerance Analysis, DFM, Mechanism Design, FDM/SLA Printing, Silicone Molding, Design for 5-Axis CNC
Test & Electronics	DAQ, LabVIEW, Signal Conditioning, Force/Vibration/Thermal Test Benches, PCB Design, Soldering, Arduino, Raspberry Pi, ESP32-C3, Dynamixel