ARNAV CHOPRA

(347) 246-1983 | arnav1703@gmail.com | linkedin.com/in/arnav-chopra-733a7126a/

EDUCATION

New York University — New York, NY
Master of Science in Mechatronics and Robotics (GPA: 3.75/4.0) — May 2026
Bachelor of Science in Mechanical Engineering (GPA: 3.7/4.0) — May 2025
Honors: Dean's List 2021 - 2024
Relevant Coursework: Reinforcement Learning, Robot Locomotion, Computer Vision, Control Systems, Mechatronics, FEA

TECHNICAL SKILLS

Machine Learning & AI: Reinforcement Learning, Vision-Language Models (VLM), Agentic Evaluation, PPO, SAC, PyTorch, TensorFlow, Reward Function Design, Domain Randomization, Error Analysis
Computer Vision & Robotics: OpenCV, YOLOv8, MediaPipe, Visual SLAM, RRT Motion Planning, Extended Kalman Filters (EKF), Particle Filters, ROS2, Isaac Lab, NYU Greene (HPC Cluster)
Controls & Hardware: System Modeling, LQR, MPC, PID, Arduino, Raspberry Pi, NVIDIA Jetson Orin
Programming Languages: Python, C++, MATLAB

INDUSTRY EXPERIENCE

HCL Technologies — June 2024 – August 2024
Computer Vision Intern
- Developed an end-to-end perception pipeline utilizing OpenCV and YOLOv8 to detect safety equipment and objects within real-world quick service restaurant environments.
- Trained and evaluated object detection models across challenging environmental variances (lighting, occlusions, viewpoints) to achieve a baseline mAP50 of 52%.
- Integrated perception framework outputs into system-level execution logic, verifying real-time operational reliability.

InnovFusion Tech — June 2023 – August 2023
Mechanical Design Intern
- Conducted Finite Element Analysis (FEA) on structural components to evaluate stress distribution, fatigue, and deformation.
- Iterated physical designs based on simulation analytics, successfully increasing component lifecycle by 126% and reducing maximum operational stress concentrations by 22%.

CORE AI & ROBOTICS PROJECTS

Visual Anomaly Detection & VLM Safety Evaluation
- Co-developed the Obstacles Out-of-Place Scoring (OOPS) framework to systematically evaluate the spatial reasoning, safety compliance, and contextual understanding of Vision-Language Models (VLMs) in navigation tasks.
- Curated a structured dataset of real-world scene anomalies to stress-test models including ChatGPT, Gemini, and InternVL.
- Performed rigorous error analysis to isolate systemic model failure modes, spatial inconsistencies, and overconfidence trends, formulating concrete optimization strategies for human-aligned, risk-aware AI evaluation.
- *Skills:* Vision-Language Models (VLM), Spatial Reasoning, Error Analysis, Dataset Curation

Quadruped Robot Locomotion via Reinforcement Learning
- Trained robust locomotion policies for a Unitree Go2 quadruped within NVIDIA Isaac Lab, deploying scalable training pipelines across the NYU Greene High-Performance Computing (HPC) cluster.
- Designed multi-objective reward structures targeting precise foot placement, torque smoothness, slip reduction, and balance.
- Applied domain randomization over irregular terrains, velocity commands, and external forces to ensure broad policy generalization.
- *Skills:* Reinforcement Learning, Isaac Lab, PyTorch, High-Performance Computing (HPC), Python

Multi-Link Inverted Pendulum Stabilization via RL
- Implemented and cross-evaluated Proximal Policy Optimization (PPO) and Soft Actor-Critic (SAC) reinforcement learning algorithms to balance a multi-link dynamic inverted pendulum system on a cart in NVIDIA Isaac Lab.
- Designed targeted reward formulations to maximize upright stability, eliminate transient oscillations, and penalize excessive control effort.
- *Skills:* Reinforcement Learning, PPO, SAC, Isaac Lab, Reward Design

Real-Time Gesture Recognition & Robotic Command Pipeline
- Built a low-latency, vision-based hand gesture recognition pipeline processing live camera feeds to map human intent directly to physical robotic control coordinates.
- Utilized MediaPipe and OpenCV to isolate hand landmarks and classify spatial patterns reliably under varying illumination.
- *Skills:* Computer Vision, MediaPipe, OpenCV, Python

ACADEMIC EXPERIENCE

New York University Department of Mechanical and Aerospace Engineering — September 2025 – May 2026
Course Assistant – Machine Design and Structures Practicum
- Provide direct technical guidance and lab supervision to undergraduate students; manage objective grading metrics for assignments and quizzes under strict confidentiality guidelines.