

Hemal Arora

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EDUCATION

Stanford University

B.S. Electrical Engineering (Hardware and Software Track) | GPA: 3.85/4.0

Stanford, CA

Expected May 2027

- Coursework: Machine Learning (CS229), Reinforcement Learning (CS238/CS234), Intro to Robotics (CS223A), Principles of Robot Autonomy I (AA174A), Robot Perception (CS227A), Digital Systems Architecture (CS107E/EE108/EE180), Circuits (EE101A/B), Signals (EE102A/B).

EXPERIENCE

Stanford Autonomous Underwater Vehicle (AUV) Team

Robotics Software Engineer

Stanford, CA

Jan 2026 - Present

- Building a robotic submarine's autonomy stack in ROS 2, including 3D object detection with YOLO and stereo depth, EKF-based IMU/DVL localization, constrained SE(3) B-spline trajectory generation, and 6-DOF PID control with pseudoinverse thrust allocation across 8 thrusters. Advised by Prof. Oussama Khatib.
- Competing in RoboSub 2026, an international competition requiring autonomous navigation and manipulation, and supporting marine research with MBARI through NeRF 3D reconstruction of underwater targets.

Multiply Labs

Robotics Software Engineering Intern

San Francisco, CA

Jun 2025 - Dec 2025

- Developed a proof-of-concept motion generation system for Multiply Labs' robotic cell therapy manufacturing cluster in NVIDIA Isaac Sim, using RMPflow to execute collision-free trajectories without hard-coded waypoints.
- Trained Diffusion Policy and Action Chunking Transformer (ACT) models on 150 teleoperated demonstrations for reliable cell-cartridge insertion into millimeter-scale slots, deployed and evaluated on a UR10e robot.
- Developed a production-ready camera SDK (mypy-strict, 100% pytest coverage) used for cluster-wide ArUco-based auto-calibration, and collecting Unitree G1 datasets to fine-tune NVIDIA's GR00T VLA model.
- Stress-tested docking interactions under X/Y-axis tilt with 700+ trials across 70 tilt levels; identified 11 failure modes with force data and validated a $\pm 2.5^\circ$ tolerance, eliminating ~10 minutes of bring-up on 50+ docks.

Prismatic | Stanford Institute for Human-Centered AI & Stanford Medicine

Founding Engineer

Stanford, CA

Jan 2025 - Mar 2026

- Developed an LLM-driven [systematic review platform](#), achieving 96.1% accuracy in replicating human-led biomedical reviews while reducing completion time from 1.3 years to <1 hour; partnered with the WHO.

GE HealthCare & Stanford Magnetic Resonance Systems Research Lab

Undergraduate Researcher

Stanford, CA

Jun 2024 - Sept 2024

- Designed a mm-wave radar system for non-contact vitals sensing in MRIs; fabricated custom PCBs with KiCAD and developed a signal processing pipeline using SSA & ICA for respiration/heartbeat waveform separation.
- First-author abstract accepted to the International Society for Magnetic Resonance in Medicine (ISMRM) conference: '[MM-Wave Radar Vitals Sensing: Towards Non-Contact Cardiac and Respiratory Gating for MRI](#)'

PROJECTS

- **Maximum Likelihood RL for Continuous Control Robotics:** First application of MaxRL (inverse-probability gradient reweighting) to [sparse-reward 7-DOF robotic manipulation](#); pretrained a goal-conditioned behavior cloning policy with hindsight relabeling, then RL fine-tuned with MaxRL and benchmarked against RLOO.
- **Diffusion Test-Time Compute:** Developed an [inference-time scaling framework](#) for DDPMs using denoising trajectory-space search and novel scoring functions to enable guided image generation without retraining.
- **1st Place, OpenAI Prize (TreeHacks):** Developed a [generative storytelling platform](#) that utilizes real-time EEG brainwave data to dynamically adapt plot, visuals, and sound effects with GPT-4o, ElevenLabs, and Luma Labs.

SKILLS

- **Languages:** Python (PyTorch, NumPy, Pandas, FastAPI), C++, C, Matlab, SystemVerilog, RISC-V Assembly.
- **Software:** Isaac Sim, ROS, MuJoCo, PyBullet, Fusion 360, KiCAD, Altium Designer, LTSpice, Git.