

# Ashwani Rathee

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## EDUCATION

### University of California, Santa Cruz

September 2024 - June 2026

Master of Science in Computer Science

GPA: 3.88/4

- Advised by Prof. Alex Pang and Prof. James Davis on computer vision for autonomous vehicles and smart glasses
- Coursework: Deep Learning for Advanced Computer Vision, Visual Navigation for Autonomous Vehicles, UAV Modelling and Control, Analysis of Algorithms, Modern Algorithmic Toolbox, Computer Graphics, Distributed Systems

### Panjab University

August 2019 - May 2023

Bachelor of Engineering in Information Technology

GPA: 3.88/4

## TECHNICAL SKILLS

**Languages:** Python, C++, JavaScript, C, SQL

**Libraries/Frameworks:** PyTorch, ROS2, Gazebo, ONNX, OpenCV, Node.js, WebGL, Three.js, WebXR, Unity

**Infrastructure/Databases:** Docker, Kubernetes, AWS, PostgreSQL, SQLite, Prometheus, Grafana

**Concepts:** Software Development Life cycle (SDLC), Object Oriented Programming (OOP)

## EXPERIENCE

### VIS Lab, UC Santa Cruz

October 2024 - June 2026

Research Assistant

Python, Javascript, C#

- Developed two Augmented Reality (AR) based navigation aid apps with WebXR and Unity for Quest and Viture smart glasses
- Contributed to a multi-agent refinement system for guideline-consistent segmentation; accepted at AAAI 2026
- Benchmarked 6 segmentation models on the Waymo dataset to show a +8.6 global IoU improvement in guideline consistency
- Collected multi-view smart-glasses data, reconstructed a 3D model of school, and hosted assets on S3 and Nautilus Cluster

### FleetSafe

January 2023 - July 2024

Software Engineer

C++, C, Python

- Designed a multi-sensor scene-understanding platform on custom Linux ARM64 systems, deployed across 50+ sites
- Built an efficient ETL-style sensor pipeline, reducing packet size by 80% with support for radar, camera, IMU, and GPS
- Enabled sensor interfacing and calibration by adding support for GPIO, UART, I2C, networking, and logging
- Ensured network redundancy, regression testing, and OTA updates for reliable field deployments

## PROJECTS

### Agent-Based 3D Object Detection for Smart Glasses

- Led end-to-end master's project on training-free multi-agent refinement for 3D object detection on smart-glasses data
- Designed an iterative Worker-Supervisor agent pipeline using VLM-based critique to identify issues from worker's output
- Evaluated on the EFM3D benchmark, improved joint mAP by 10% over BoxerNet and EFM3D baselines

### Remote Controlled Car with Raspberry Pi 5

[Link](#)

- Developed a ROS 2-based edge system with various sensors and I/O support for conducting robotics/vision experiments
- Built a monocular visual-inertial odometry pipeline using camera-IMU sensor fusion for real-time pose estimation
- Built an image classification pipeline evaluating CLIP, HSV-based OpenCV heuristics, and Qwen2.5-VL baselines
- Achieved 0.97 F1 with the best real-time model and built a pseudo-labeled data pipeline for training lightweight CNN classifiers

### Navigation, Modelling and Control for UAV

[Link](#)

- Modelled the kinematics, dynamics, control, sensors and state estimation of Aerosonde and Quadrotor
- Evaluated predicted trajectories from two SLAM pipelines (ORB-SLAM3, KimeraVIO) on EuRoC data with evo
- Benchmarked feature descriptors for keypoint matching, feature trackers and motion estimation algorithms

## ACHIEVEMENTS

- V. Vats, A. Rathee, and J. Davis, "Guideline-Consistent Segmentation via Multi-Agent Refinement", AAAI 2026
- Contributed as a Open Source Developer in Google Summer of Code for improved Exif, GIF support and image processing docs
- Ranked in the top 0.9% on NeetCode, with a peak ranking of 172/10,000 and 150+ DSA problems solved
- M. Juneja, A. Rathee, et al., "Denoising of MRI of brain tumor using BT-Autonet", Elsevier BSPC Journal 2024