Ritik Vaishnav

Portfolio: ritikonboard.github.io
LinkedIn: linkedin.com/ritikvaishnav
Email: ritikvaishnav20@gmail.com
Github: github.com/ritikonboard

Education

MBM University — Jodhpur, India
Bachelor of Engineering - Electronics and Electrical Engineering — *July 2021 - June 2025*

Skills

Languages	Python, C++
Frameworks	PyTorch, TensorFlow, OpenCV, YOLO
Tools	ROS, FFmpeg, CARLA, Pylot, Git, Linux

Experience

Wireless Systems Engineering Lab - IIIT Delhi — Delhi
Research Intern under Dr. Arani Bhattacharya — *June 2024 - Present*

- Designed and implemented a stereo-guided super-resolution perception pipeline to extend long-range object detection in autonomous vehicles.
- Integrated StereoSGBM for real-time depth estimation to guide selective tile offloading.
- Utilised CARN to superresolve the selected tiles and benchmarked the setup to have 136 percent more detections than baseline YOLO.
- Implemented efficient video encoding and streaming using FFmpeg (H.264) and RTSP in CARLA, achieving >80% bandwidth reduction with PSNR >30 dB.
- Enabled real-time vehicle control in CARLA through keyboard stroke integration for remote teleoperation.
- Optimized the Pylot pipeline by replacing Faster-RCNN with lightweight YOLOv8n, reducing detection latency and enabling dynamic cloud-based switching to YOLOv8x for complex scenarios.

Embedded Systems & Robotics Workshop — Jodhpur
Robotics Mentor — *June 2023 - Aug 2023*

- Shared all what I learnt about Electronics and Programming, during my time at ESRC under Prof. Alok Singh Gahlot, and mentored a batch of 100+ undergrads.

Projects

StereoSR for Autonomous Vehicle Perception (Sept 2025)

- Implemented stereo vision pipeline for depth estimation using dual camera setup in CARLA simulator.
- Achieved strong accuracy with ground truth validation against CARLA's native depth sensor.
- Benchmarked the setup on KITTI Stereo dataset with an MAE of 5.70m.

PaperPerspective (April 2024)

- Implemented Perspective Transformation in real-time, eliminating the need for camera or whiteboard setups.
- Utilized OpenCV and pyvirtualcam.

Autonomous Rover with Real Time Video Feedback (July 2022)

- Integrated an ESP32 Camera with a Raspberry Pi Pico-driven fast line-follower rover.
- Ensured seamless real-time video streaming through a Live Web Server.
- Optimized PID control parameters for enhanced accuracy.

Position of Responsibility

Pixellens: Film and Photography Club, Founder — Jodhpur
Created and led multiple creative film and photography projects with a community of 50+ members. — *March 2022 - Present*

Interests

Research Interests: Autonomous Vehicles, Embedded Systems, Computer Vision, IoT, Edge AI

Abstract Interests: Filmmaking, Music

Achievements

How Far is too Far? Fixing Vision of Autonomous Vehicles using Selective Super-Resolution — COMSNETS W
Paper accepted in MINDS Workshop, COMSNETS 2026 — *Dec 2025*

Best presentation at RIISE 2025 — Delhi, India
Poster titled- How Far is Too Far? Fixing AV vision with the cloud. — *Sept 2025*