

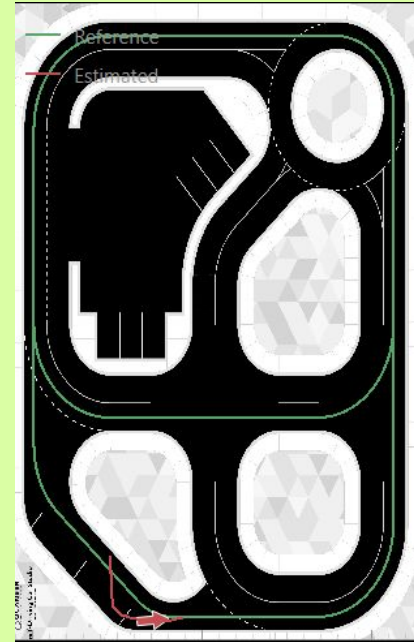
QCar Autonomous Driving Simulation

BY: ODU AV TEAM



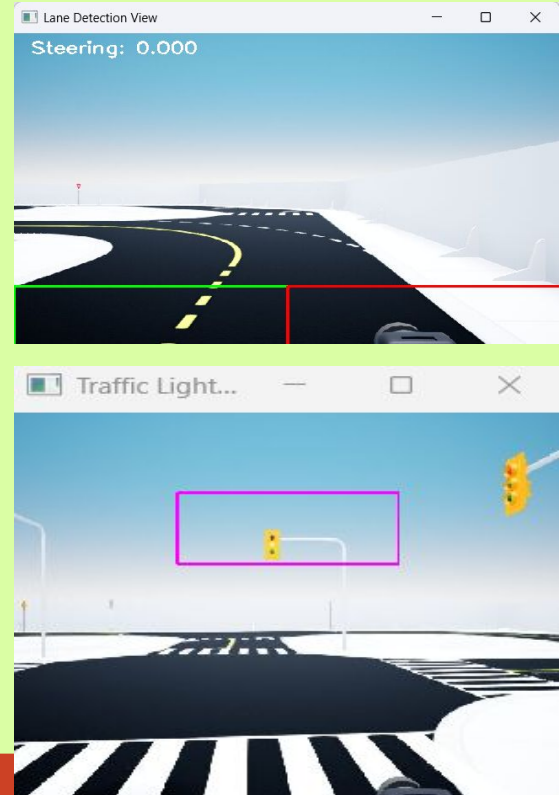
Path Planning using Waypoints

- Route defined using waypoints
- Stanley controller adjusts steering
- Path optimized for smooth and safe driving



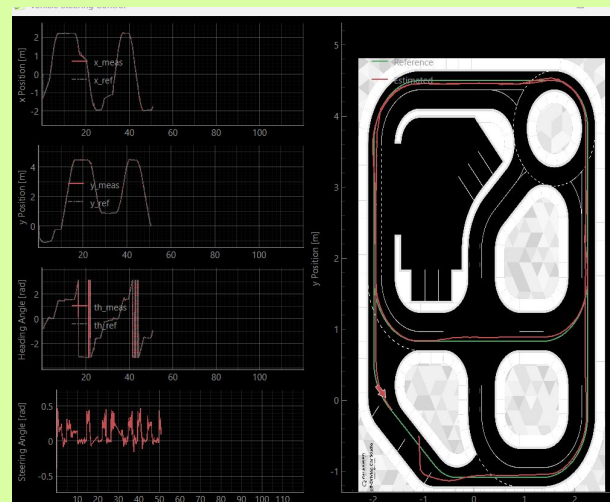
Camera-Based Perception

- 4 cameras: front, left, right, rear
- Front → detects stop signs, traffic lights (HSV method)
- CSI cameras → lane line + curb detection
- Continuous visual input for lane keeping



Localization Using Extended Kalman Filter

- Combines wheel encoder and RealSense data
- Predicts vehicle position in real-time
- Maintains smooth and stable tracking



Next Steps Toward Stage 2

Integrate YOLO object detection on physical QCar

Real-time detection of signs and lights

Tune EKF + controller for hardware

Camera-based lane detection on physical roads



Final Run & Tracking Performance

