

Computer On Wheels

Implemented Requirements
<In Part 1>

Vehicle control

Autonomous navigation: The system shall be capable of autonomously navigating from a starting point to a destination.

Throttle control: The system shall control the throttle for regulation of vehicle speed.

Steering control: The system shall control the vehicle's steering to follow the planned trajectory accurately.

Braking control: The system shall control the vehicle's braking to safely decelerate and stop as required by the planned trajectory

Path Planning

Route Calculation: The system shall calculate the most efficient (shortest) route from the vehicle's current location to the driver-specified destination.

Lane Assignment: The system shall assign appropriate lanes for the vehicle to travel in along the calculated route.

Waypoint Generation: The system shall generate waypoints along the calculated route to guide the vehicle towards the destination.

Trajectory Planning

Trajectory Generation: The system shall plan an optimal trajectory for the vehicle to follow based on the calculated route.

Destination Arrival.

Destination Approach: The system shall approach the driver-specified destination by following the calculated trajectory and waypoints.

Stop at Destination: The system shall bring the vehicle to a complete stop upon reaching the designated destination, ensuring a smooth and safe arrival.

User Input.

Destination Setting: The driver shall be able to input the desired destination, triggering the route planning process

System Integration.

ROS Integration: The system shall utilize the Robot Operating System (ROS) to facilitate communication and data exchange between different software components.

Simulation Environment: Development and testing of the system shall be conducted in a simulated environment (e.g., CARLA simulator) for thorough validation before real-world deployment.