

Milestone 1: Project Setup (-----)

Tasks:

- Install CARLA simulator and set up the simulation environment.
- Install necessary dependencies and reinforcement learning libraries.
- Develop the initial interface to collect trust-related feedback data.
- Define evaluation scenarios (e.g., lane-switching, urban traffic, obstacle avoidance).

Deliverables:

- A functional CARLA simulation environment.
 - A documented setup guide for dependencies and configurations.
 - Initial scenario definitions and trust feedback mechanisms.
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Milestone 2: Implementation of RL Algorithms (-----)

Tasks:

- Implement and configure the following RL algorithms:
Proximal Policy Optimization (PPO)
Deep Q-Network (DQN)
Deep Deterministic Policy Gradient (DDPG)
Soft Actor-Critic (SAC)
- Ensure each algorithm is capable of receiving and processing trust feedback.
- Test the basic functionality of each algorithm in CARLA.

Deliverables:

- Implemented RL models with training scripts.
 - Initial test results for each algorithm in simple scenarios.
 - Code documentation and training setup instructions.---
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Milestone 3: Scenario Simulation & Dynamic Trust Feedback (-----)

Tasks:

- Implement predefined driving scenarios in CARLA.
- Integrate real-time trust feedback (e.g., manual interventions, hesitation tracking).
- Enable adaptive driving behavior based on trust changes.

Deliverables:

- Fully simulated scenarios with dynamic traffic and pedestrian interactions.
 - Trust feedback integration and behavior adaptation mechanisms.
 - Screenshots or video recordings demonstrating system responses.
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Milestone 4: Algorithm Evaluation & Performance Metrics (-----)

Tasks:

- Evaluate RL models based on predefined performance metrics:

Trust Calibration Metrics: Frequency of manual overrides, system engagement rates.

Performance Metrics: Cumulative reward, crash frequency, adherence to traffic rules.

Comparative Analysis: Algorithm adaptability to trust feedback, intervention rates.
- Compare how each algorithm adapts to different trust levels.

Deliverables:

- A detailed performance evaluation report.
 - Comparative charts and analysis of algorithm behavior.
 - Logged results from CARLA simulations.
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Milestone 5: Report Generation & Final Delivery (-----)

Tasks:

- Compile all findings into a structured report.
- Summarize insights on trust-adaptive behavior in RL models.
- Prepare final project documentation and codebase.

Deliverables:

- A **comprehensive report** detailing methodology, results, and conclusions.
- The **finalized codebase** with documentation for future use.