MINI ASSIGNMENT #1

Comparison of Apollo, Autoware, and ROS-Based Autonomous Vehicle Architectures

Week 1 – Autonomous Vehicle Software Architectures

Due Date: 13.10.2025 - 00:00

ASSIGNMENT OVERVIEW

Prepare a **technical comparison report** for these three common autonomous system architectures:

Apollo (Baidu) | Autoware (Foundation) | ROS-Based Custom

This assignment aims to help you understand open-source autonomous driving software architectures and their significant differences for real-world applications.

KEY REQUIREMENTS

- **Architecture Comparison:** Analyze sensor input, localization methods, perception models, planning and control modules, and simulation tools.
- **Modularity & Usability:** Evaluate open-source structure, community support, hardware dependencies, and ROS1/ROS2 compatibility.
- **Comparison Table (Mandatory):** Create a table comparing localization, planning algorithms, perception models, and hardware requirements.
- **Report (2-3 pages PDF):** Introduction, research methodology, tabular analysis, conclusion, and personal preference with justification.

LEARNING OBJECTIVES

- Understand popular open-source autonomous driving software architectures
- Compare real-world application differences between systems
- Develop technical evaluation criteria for autonomous vehicle software
- Make informed system selection decisions for autonomous projects

COMPARISON AREAS

Core Systems

- Sensor integration
- Localization methods
- Perception models
- Planning algorithms
- Control systems

Infrastructure

- Simulation environments
- Hardware requirements
- ROS version compatibility
- Development tools
- Real vehicle application

SUBMISSION DETAILS

Format

- PDF report (2-3 pages)
- Comparison table
- References page

Timing

Due Date: 13.10.2025 - 00:00

Presentation: 5-minute overview

"Perform a detailed comparison to understand the design philosophy behind each architecture"