1 Introduction

During this phase of the project, our progress was impacted by the timing of final exams and revision periods, which forced the team to balance academic responsibilities with development tasks. In addition, we encountered several technical difficulties while working with the official documentation and simulator, which slowed down our overall progress. Specifically, there were gaps in the documentation, and we faced challenges in configuring the simulator. However, despite these setbacks, we were able to identify the issues and successfully restore the vehicle's steering functionality during the debugging process. Even though we faced numerous obstacles, the team kept moving forward, solving problems as they arose and pushing ahead with the project's tasks.

2 Planned activities

1. Simulator Development:
We will continue developing a basic decision-making system within the simulator to test the vehicle’ s decision-making and response in different scenarios. Our initial focus will be on calibrating the camera for accurate data collection, followed by preparing for spatial modeling and path solving in manual driving mode. This phase will set the foundation for the vehicle’ s autonomous driving system.

2. Vehicle Integration:
In parallel with simulator development, we will work on integrating the vehicle with the simulator to ensure smooth communication between hardware and software. This integration is key to testing and refining the system’ s performance in real-world conditions.

3 Status of planned activities

During this phase, we encountered several technical challenges, particularly related to the official documentation and simulator configuration. The main issues we faced were as follows:

Documentation and Library Issues: While using the "Brain Ros" library, we discovered that some crucial files were missing, preventing us from successfully launching ROS on the Raspberry Pi. Despite following the steps in the documentation, the missing files caused configuration failures. After thorough analysis, we identified the root cause of the issue and supplemented the missing components by consulting additional resources.

While configuring the “ROS Vehicle and Simulator Integration” (referencing the official documentation: link), we encountered the following error:
source devel/setup.bash
-bash: devel/setup.bash: No such file or directory

This error prevented us from properly loading the simulator environment. In an effort to resolve this, we reached out to the official forums for support but have yet to receive a response.

Although these challenges slowed our progress, overcoming them has provided valuable insights and learning experiences that will aid the next stages of development. We have now successfully connected the vehicle to the simulator and restored its steering functionality.

4 General status of the project

As a result of the challenges we encountered, our project progress has been delayed. This was especially true for the debugging of the perception module, where the gaps in the official documentation and issues in the codebase made it difficult to proceed as planned. At this point, we have only managed to connect the simulator to the vehicle and have not yet moved forward with perception or control testing.

However, despite these delays, the troubleshooting process has been an essential learning experience. It has given us a clearer understanding of the project's requirements and how to approach solving technical problems. We are confident that, as these issues are gradually resolved, we will be able to get the project back on track and accelerate progress moving forward.

5 Upcoming activities

To make up for the delays and ensure the project stays on schedule, we have outlined the following actions for the next phase:

1.Progress Recovery:
We will continue resolving existing technical issues, particularly those related to simulator configuration and ROS system integration. Our goal is to ensure that all modules are properly debugged and functioning smoothly.

2.Path Tracking Module Design:
We will begin designing the vehicle's path tracking module, ensuring that the vehicle can accurately follow a given path in various environments. This module will be a crucial component for the vehicle’ s autonomous driving capabilities, and we will focus on improving its reliability and stability.

3.Autonomous Driving State Machine Design:
Once the path tracking module is complete, we will move on to designing the state machine for autonomous driving. This state machine will enable the system to switch between different driving modes based on the environment and tasks at hand, facilitating smart decision-making and vehicle control.

We are confident that, through these actions, the project will regain momentum and continue moving toward the successful completion of our goals. While there are still challenges ahead, we are optimistic that, through the team’ s combined effort, we will overcome them and bring the project to fruition.