1 Introduction

This report outlines the progress achieved during the second month of the project. The team has moved beyond the initial familiarization phase to dive deeper into the codebase, perform testing of the motor in "auto" mode, and prepare for the implementation of additional features. Significant strides have been made in research, practical testing, and resolving hardware-related issues. Additionally, the team has initiated plans to incorporate color detection into the project and successfully implemented a state machine to stop the car when red is detected.

2 Planned activities

At the beginning of the reported period, the following activities were planned:

1) **Deeper exploration of the codebase**
- Analyze and understand how specific algorithms and control logic are implemented.

2) **Testing the motor in "auto" mode**
- Conduct practical tests of the motor in autonomous mode.
- Validate the interaction between the motor and control system.

3) **Team discussions and planning**
- Ensure alignment on project goals and resolve uncertainties.
- Plan the next steps for implementation and testing.

4) **Resolving hardware issues**
- Purchase and set up an adapter for the battery to ensure proper operation.
- Verify hardware functionality and resolve any lingering issues.

5) **Link the camera to motors**
- Design and implement a state machine to stop the car when red is detected.
- Develop an algorithm for line detection & keeping.

3 Status of planned activities

1) **Deeper exploration of the code base**
- Status: Completed
- Implementation: The team successfully analyzed the codebase in detail, focusing on how messages are sent and received and how threads are working.
- Difficulties: No major difficulties were encountered, but a few areas of the code required clarification, which was resolved through team discussions.

2) **Testing the motor in ”auto” mode**

- Status**:** Completed
- Implementation**:** The motor was successfully tested in "auto" mode. The team verified that the motor responds to control signals as expected.
- Difficulties: A better way to upload fast the code on the brain needs to be found, because now it takes a lot of time from when something is modified, until it reaches the car for testing.

3) **Team discussions and planning**
- Status**:** Completed
- Implementation: Regular meetings were conducted to ensure all members are aligned with the project’s progress and objectives.
- Difficulties: Time constraints due to other urgent projects that each member had.

4) **Resolving hardware issues**
- Status: Completed
- Implementation: The team purchased and installed a battery adapter, resolving the previous issue with mismatched charging cables.
- Difficulties: Initial delays in sourcing the correct adapter.

5) **Link the camera to motors**
- Status: Completed
- Implementation: The team designed and implemented a state machine that successfully stops the car when red is detected. Moreover, a line detection algorithm has been developed, but it still needs to be implemented on the car.
- Difficulties: It took some time to figure out how everything is connected.

4 General status of the project

The project has progressed significantly in its second month:
- The team has gained a deeper understanding of the codebase and identified areas for optimization.
- Testing of the motor in "auto" mode was successful, with most hardware issues resolved.
- Now the car stops when the red color is detected, otherwise it keeps going.
- A line detection algorithm is underway, marking a shift towards more advanced features.

Outstanding tasks include finalizing line keeping techniques and preparing for the integration of these methods into the system.

5 Upcoming activities

- Finalize the implementation of color detection techniques, expanding the state machine functionality to handle additional traffic signals and road signs.
- Begin integration of line keeping with the image processing pipeline.
- Develop and test basic lane detection and vehicle movement algorithms.
- Maintain regular team discussions to address challenges and plan future work.