1 Introduction

For the first report of the BFMC we had a lot to start with. Firstly, we had to study through the documentation, to get a better understanding of how everything is supposed to work and how we are supposed to move on with this project. After that, we assigned to each member the tasks that they will have to work on and the roles that everyone will have inside the team. That will help us benefit the most from each other's skills and bring to life our vision of this project. Moving on, the next thing we did was defining how everyone is seeing the end product and discuss on it, by doing this we were able to see everyone's perspective into the final state of the vehicle and find out the best suggestions for each task. Moreover, one of the first tasks was also to make a project plan, that includes everything we have to do and the timelines that they are supposed to be delivered by. This will be the guide, for the team throughout the whole time that we have to finish the project. Also, we defined a first version of the architecture that we are going to follow for our system. Where all the tasks are more defined, and we know how to make the communication between the packages. Lastly, after doing so we tried to find for new hardware to add, either sensors or some improvements on the parts that we already received, to put our own touch into the vehicle.

2 Planned activities

So, for the starting point we studied thorough the documentation so we will be ready for the discussions on the planned meeting in case we have some questions, and we wanted them answered.
Then, we assigned the roles and the tasks to each member of the team. We assigned two of our members on developing the programs needed for the autonomous functions of our vehicle through algorithms. For example, our first try will be by trying out the Hough transform for the line detection algorithm and examine how we can then implement it for intersections also. Moreover, they will have to ensure that all the data are being acquired accordingly and that everything of the implementation works in real-time, by monitoring and debugging. Also, one of our members will be handling out the tasks required for the microcontroller programming and the communication protocols between the devices, any extra integration of sensors or extra hardware and PCB's. The rest of the members will contribute by developing and training all the models that have to do with object and scene detection and then with their classification. We are currently working on the physical steering of the car through calibration of the servo and adjusting some parameters to fine tune the responsiveness.
Meanwhile, we are working on making the testing track with our mentor. Our mentor has already communicated with the company from which we are going to buy the suggested material for the track. Also, we have started printing the assets of the track (signs, ramp, tunnel, separator blocks).
Later, we developed the software architecture of our system so we can get a first taste of how everything will communicate and work together.
By developing the software architecture of our system, we will have a clearer view of how we are supposed to make the timelines for each task and how they have to be developed in parallel all together. That meant, we had to create a project plan for our team.
Lastly, we have already developed some algorithms for the lane following tasks so we can be ahead of time

3 Status of planned activities

Read the documentation:

- Status: completed
- Implementation: Understanding the code given and participation in the online discussion.

Find hardware improvements for the car withing the budget:

- Status: ongoing 50%
- Implementation: replacement for the camera, distance sensor, light sensor, headlights for better lighting.
- Difficulties: Finding the replacement for the camera.

Controlling the car with the dashboard:

- Status: completed.
- Implementation: Setting the serial handler to true.
- Difficulties: We found no difficulty controlling the car via the dashboard.

Camera feed:

- Status: Postponed
- Implementation: Camera not responding, we will find a replacement for the camera if we do not find a way for the original to work. We had to set the camera to false in the main.py otherwise the code will have no output.
- Difficulties: The raspberry cannot detect the camera. We think it is a problem with the camera itself.

Testing track:

- Status: ongoing 20%
- Implementation: Track material found and working with the company to print the layout for the track, 3d printing the signs, ramps, separator block, tunnels, buying the traffic lights and the pedestrians.
- Difficulties: Delivery time through amazon, trying to find locally.

4 General status of the project

So far, the can vehicle can be controlled through the dashboard, but we cannot get any image through the camera. We have also developed some lane following algorithms and calibrated the steering, but we cannot implement anything until we figure out the problem with the camera. The tasks that were supposed to be carried out for the first report have been completed for the most part and we are already working on the tasks for the second report.

5 Upcoming activities

1. Lane detection algorithm
2. Camera handling (define ROIs)
3. Finish project architecture and communication with packages
4. Lane following and basic speed control
5. Vehicle can stay on track