1 Introduction

This report provides a detailed overview of our team's composition, team spirit, the tasks we have completed in this phase, and the tasks we plan to accomplish in the next month.
Our team is named "Yangtse," inspired by the Yangtze River, which is both our mother river and a symbol of the cultural and spiritual heritage of Wuhan, Hubei. The river has nurtured us, and its spirit continues to inspire our collective endeavors.

Our team consists of four members, each with unique skills and expertise. Ma Xiaotian, our team leader, and Wang Junjie are from Wuhan University of Technology. They participated together in the Formula Student Autonomous China competition and achieved outstanding results. Both have a deep understanding of autonomous driving and control theory. Xing Jinwen, our technical advisor, comes from Northeastern University. He has experience in multiple renowned competitions such as Robomaster, and has rich experience in team collaboration and system architecture design, helping to set the strategic direction for our project. Hua Haoming, from Shenzhen University, has experience in algorithm design from participating in competitions like ICPC.

From the outset, we realized that an efficient team is built on a strong team spirit and a competitive attitude. Despite our different personalities and varying levels of expertise, we have worked closely together from the beginning. While each of us has distinct responsibilities, we have been dedicated to helping and teaching each other, solving problems as they arise.

In summary, our team has demonstrated strong cohesion and successfully completed all objectives in the first month according to plan.

2 Planned activities

In the first week of the competition, we completed the environment setup, project construction, and initial vehicle debugging. By reading documentation and studying sample code, we gained a deep understanding of the competition's rules and requirements, and began developing the initial framework for our project.

The tasks for the next phase include:

Simulator Development: We will develop a simple decision-making system on the simulator, calibrate the camera, and prepare for spatial modeling and solving in manual vehicle operation mode. (Assigned to Ma Xiaotian and Wang Junjie)

Line and Traffic Detection: We will create an artificial dataset for the simulator, focusing on traffic detection. (Assigned to Xing Jinwen and Hua Haoming)

3 Status of planned activities

We have completed the construction of the vehicle and successfully conducted the first manual-mode ground test. However, we discovered that the mechanical structure connecting the steering motor and servo was missing (as shown in the video we uploaded). Ma Xiaotian

and Wang Junjie are actively contacting the Bosch representative in China to address this issue.

Xing Jinwen and Hua Haoming are working on generating artificial datasets using common image enhancement and transformation techniques. Additionally, they are gathering traffic datasets from online sources and working on building the benchmark and cleaning the datasets.

To improve real-time video processing for vehicle operation, we realize that building a suitable testing environment is essential. Currently, this task is actively being planned.

4 General status of the project

We are confident that all planned activities will be completed before their respective deadlines. At present, the vehicle cannot perform any autonomous driving tasks because the core architecture has not yet been finalized. We are currently relying on manual control, and we have successfully transmitted movement commands from the decision-making process to the vehicle, achieving brief straight-line motion.

We are excited to have access to the autonomous driving laboratory at Wuhan University of Technology, where we can use their facilities to build the testing track.

5 Upcoming activities

For the upcoming reporting period, we have planned the following activities:

Mobile Control: Implement vehicle forward movement, parking, overtaking, and obstacle avoidance.

Localization Fusion: Integrate data from multiple sensors to improve localization accuracy.
Decision-Making Validation: Validate and optimize our decision-making algorithms.

Enhancement of Detection Technologies and Deep Learning Models: Further improve the vehicle's perception capabilities.

Testing Track Construction: Complete the construction of the testing track to provide a suitable testing environment for future trials.