Team 404NotFound

Member names and student numbers :

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Team Management Report

We are the team 404NotFound, which contains three members: Fuhuo Xiong, Hongkang Song, and Yanpu Huang. The reason that we established our team was that the same group scheduled us and we are all Chinese; We can speak the same language if we cannot express the problem in English perfectly. Thus, we do not face any language issues during this year. We have successfully achieved every task that was required and got the full marks on final testings of both two semesters. Our team had excellent management which every member can take their advantage to contribute to our project. Due to our task allocation, our project proceeded faster than the other group in the lab session. In this report, I would like to talk about how we managed our team specifically; I divide the whole report into Term 1 part and Term 2 part.

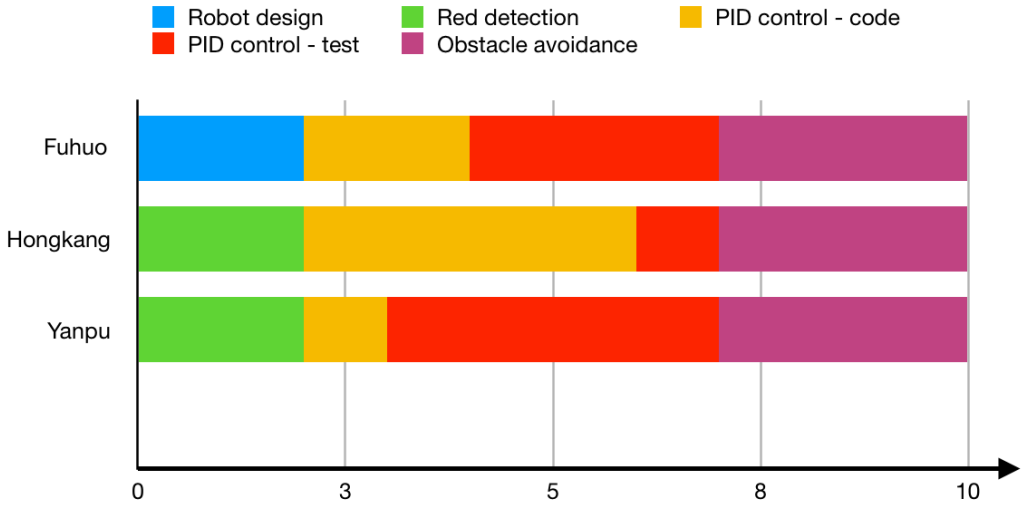
Term 1

1.Summary Plan

In the term 1 we were required to make a robot that obtained following features:

1. The robot can follow a lane to move
2. The robot can detect the red colour and stop immediately
3. The robot can avoid an obstacle on the lane.

In the first week, we were getting known to each other and tried to build a robot. Because we were provided any further information, the first week we did nothing. Thus, our officially working started in the second week. In week 2 to3 we finished our robot design and coding for the differential drive and red colour detection. After that, we spent 4 weeks on PID control and the data adjusting. At last, the obstacle avoidance was finished before week 10, and we had two extra lab sessions to improve the stability of our robot. The specific schedule is shown below.



2. Develop progress

We have allocated our job depended on the area of expertise. There are three types of jobs: main coder (Hongkang Song), error and data tester (Yanpu Huang) and the assistant for them(Fuhuo Xiong). Most of our code was written by Hongkang Song with helped from Fuhuo Xiong. Moreover, Yanpu Huang tested our program on a real-world board. However, it was quite hard to analyse a massive number of data. Thus, Fuhuo Xiong would help Yanpu Huang with data adjusting if Hongkang felt well on coding. Sometimes, Hongkang and Yanpu would ask Fuhuo to make some adjustment on robot design to adapt the code or the real-world situations.

Our development part did not take a long time to finish, but it still spent a significant percentage time on adjusting the code to optimise our program, which made us easier when we were testing data. At the stage of obstacle avoidance, we had successfully achieved the target that the robot could move with the black lane stably. Thus, all of our team paid attention to obstacle avoidance, which reduced our development time. However, when we finished the coding part of the obstacle avoidance, we did not have any more official lab sessions left. Consequently, we attended two extra lab sessions in the last week and successfully adjusted the data which performed excellently in the final practical test.

3. Conclusion

In term 1, all of our team members spent time getting familiar with the robot and the coding environment. Most importantly, we all needed to be familiar with other members and find what we were expert in and what we were capable of. Consequently, we wasted so much time that we needed extra lessons to carry out our project. That gave us the basis on term 2 projects.

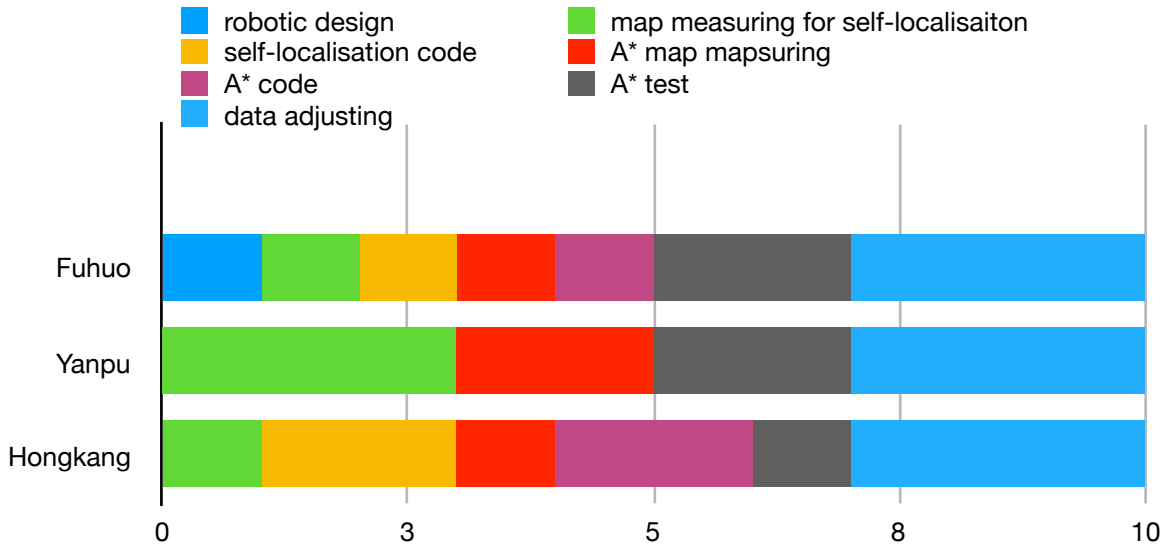
Term 2

1. Summary plan

In term 2 we were required to achieve the targets of self-localisation and path-finding. After working together for one semester, our team could operate even better. This term we finished all the target earlier than the deadline, which provided us more time on testing and data adjusting. That is the reason why our robot could perform so well in the final practice test. We have planned to accomplish the target that:

week 1: new robot design and basic testing
week 2-4: self-localisation
week 4-7: A* algorithm implementation

2. Task allocation We have allocated our jobs similarly like how we did in term 1. Yanpu Huang was mainly responsible for data and error analysis; Hongkang Song coded most of our program, and Fuhuo Xiong was also an assistant. The following graph shows what we did during 10 weeks of lab sessions.



3. Develop progress

Our code implementation could be divided into two parts, which were self-localisation and A* path-finding. After Yanpu measured on the map, Hongkang started coding the self-localisation part. At the beginning of coding, we were pretty confused about the algorithm. Thus, Fuhuo asked our TA for advise and made notes about that part. Because of that, Hongkang had a clear thought on coding. Fuhuo and Yanpu also integrated pieces of information on the map which Hongkang required. That increased our efficiency which in term 1 we were only responsible for our work. However, in contrast, we could help each other and provide information right after someone required. With a clear understanding of the algorithm and an efficient team coordinate, we accomplished self-localisation in week 4 while the other team was still testing.

For A* planning part, we used the same strategy as the self-localisation. Because we could move any further if the map measuring were not completed, all of our team participated in that. We have divided the whole map into two parts so that we could work separately on each part. After that, all of our teams started researching about A* algorithm and sorted out the idea in general. Thus, Fuhuo started supporting Hongkang with coding part while Yanpu measured the map. The coding part went very successfully in only one week so that we could test A* as many as possible. In week 7, we have managed to generate the fastest path as we thought. Consequently, in the rest of the semester, we focused on the optimisation of robot moving and reducing the possibility of collision.

4. Conclusion

In conclusion, we have accomplished all the primary targets in week 7, so we could prepare more on optimisation. In term 2, we have increased our efficiency on our team coordinate and also, we took our advantage to make our project complete successfully. After all the hardworking from our team members, our robot perform very excellently, and we were all pleasant in these two terms of cooperation