

# PROCESS REPROT



## **Process Report – Team PM12**

This process report lists the individual contributions from the team members, explaining their responsibilities and problems encountered.

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## 1. Yihan Tang

### Work for me

Since the start of the project, we have had 4 meetings with the team and are currently discussing the material and the size of our car. Prior to every meeting I send each team member a message with the meeting place and time. For SSV part 1, we created 3 smaller sub-teams to complete the different aspects of the case. I am in the sub-team that will calculate the gear ratio. We have three members in our sub-team. Assuming the weight of the car is 1 kg and the diameter of the wheels is 0.04m, we calculated the first gear ratio. Through discussion, we assumed two other gear ratios to calculate and conclude the first one to be best. Upon completion we sent the data to the Simulink sub-team for the simulation.

### Problems

The first problem I encountered was searching for the rolling friction coefficient on-line, as most friction coefficients listed are static friction coefficients. After asking our coach for help, we decided to assume a value of 0.01.

As a teamleader; I think I am not so good, I should contact our members more frequently and update the information that our members want faster. We also have communication difficulties as we have to communicate in a language that is not mastered by any of the team members. I feel I should practice my English more to minimize the communication problems in the future.

## 2. Haowen Sun

### Work for me

During the past five week, we have had four team meetings. We discussed our cooperation contract, the plan of approach, work breakdown structure, Gantt chart and our wiki page. I was working for our wiki page. My work is to upload all our new work on the wiki page and update new meeting reports with my teammate Zhengyuan Huang. In our meetings we are also discussing the parameters for our solar car, such as shape, gear ratio, weight and so on. In the SSV part 1, I work for the simulink sub-team with Huang, using matlab. We watched the instruction video and read the PPT about using matlab. We used the data from the others (gear ratio) to get the best ratio to use on our solar car.

### Problems

During our work, communication is a big problem. We need to pay more attention to our English. And we should communicate more with the others so everyone knows what we are doing (because of our exam).

### 3. Hongzhu Qian

Firstly, we discussed the initial idea about our solar car and divided different tasks to every member. I am in charge of the gantt chart and work breakdown structure. As for the initially limited number of members, I made some mistakes on the working hours for everyone. Afterwards I adjusted the gantt chart to encompass the whole project.

When we worked on SSV part1 and simulink, I recalculated the gear ratio many times. Because we cannot about the value of the wheels friction coefficient, we assumed many different values which all lead to different gear ratios. At the end, we assumed a value in agreement with our coach and calculated the gear ratio. We obtained the result that the best gear ratio is very close 8. After that we discussed the shape and some specific values, such as the radius of wheels. Meanwhile we are searching the information of materials on the Internet, trying to find a suitable gearbox/transmission and axle.

### 4. Willem Noyen

I'm glad with our team, the atmosphere is good. Despite the different nationalities, our communication goes very well. Of course it is always easier to speak your own language, so this is positive in our team.

We pay very good attention to the deadlines. This is mostly thanks to our team leader.

What I sometimes dislike, is that we change subjects a bit too quick. For example, when we are looking for a solution for the wheels, after a while we start to talk about the gears. Then after a while we switch to the design and we don't really finish the subject of the wheels.

It is still early in the project, but maybe we should discuss the subjects on the agenda and finish them. So we know what we're going to do. This will provide more structure to our meetings.

### 5. Zhengyuan Huang

It is a great honor to cooperate with the teammates. We work together and have fun together. Most of the time I am a listener because of my poor English skills. I am in charge of the team logo and part of updating the Wiki page. Also I worked on simulating the race to find the ideal transmission ratio with Haowen Sun.

**Problem:** When at first I updated the Wikipedia, I didn't know how to upload pictures to the webpage. Sun helped me with this problem and solved it. I wasn't familiar with the form on Wikipedia either and had some difficulty constructing action lists. When we simulate the race, we had to use software "Matlab". At this part, we had difficulties on editing the different blocks, connecting them in a proper way.

## 6. Yared Rida

Firstly we discussed the initial idea about our small solar car, this meant agreeing on some basic assumptions.

We divided different tasks to every member; I'm assigned to the group that has to solve and calculate the gear ratio for the small solar car with 2 other two persons of my group.

I started my calculations with some assumptions, and I got the calculated gear ratio from one of my group member, so based on that by making another assumption by taking a smaller gear ratio than the calculated gear ratio, and I calculate the total time that our SSC can spend to cover the flat and sloped path. Comparing the value of total time with the previous value, I decide that the calculated gear ratio is better because it has less total time than the small gear ratio.

In the whole steps of calculating there was some mistakes and misunderstandings, but I solved the problem by discussing with my group members and with my coach, and finally arrived to the best solution.

The second thing I'm calculating is the static friction force with my group members, actually we are not finished yet with that calculation but definatly we will finish it soon.

## 7. Jan Bleumers

Initially, I wasn't all too pleased with the fact that I had been assigned to a team that could only speak English. As my own English skills and those of my team mates were not very good (at all), I felt this would be primer for major communication issues. Now, a few weeks into the project, I must admit that the communication issues are not as large as I had feared and that we are actually working together pretty well. Because I could write a bit of English, I was voted 'team secretary'. My job is to write the meeting reports and spell/grammar/fluency check all written documents. Currently, I am working in the sub-team responsible for the Sankey diagram, together with Willem.

The largest problem I encountered (besides the communication issues) was finding the most efficient method of transmission. Early into the project I suggested we could use a CVT (continuously variable transmission) to shift fluently as the load on the car changed and to be able to constantly keep the DC motor around its peak power rpm. After much drawing, calculating and estimating, we considered the CVT to be an extremely difficult side project with many possibilities of failure and a lot of extra working hours in designing and creating the required parts. We finally scrapped the CVT idea and opted for a fixed transmission consisting of gears. Our main focus now will be to avoid drag and other losses and make our car as light as possible in order to win the race. Should there be extra time, we will invest that into other scored categories.