Scientific paper

De Borrekens Gauthier

Intro

As members of our group did not finish the pwm / rpm measurements, I could not continue working on the feedback loop.
I will go over two ideas I have but they could not be tested nor realised before the meeting.

For the second part, I will introduce a very broad idea for the Scientific paper.
What does a scientific paper look like? What does it need to have? We will try to discuss these points followed by a sketch.

Information

The first thing I will study are the possible feedback loops to control the speed of the car

1) We will map out a relation between a PWM signal sent to the car and the speed. If this is a linear relation, we could map out a “x change in pwm is coupled by an y change in speed”.
   If we then do a measurement every 1 second (just as an example) and we set our base distance at 100cm, we will know that if a measurement gives ’95cm’, the car in front of us is relatively accelerating at 5cm/second to us, so we should slow down 5cm/sec, which the relation will calculate f(5) = reduce PWM with a given amount.

   Pro: We change our velocity depending on the velocity of the car.
   Contra: The pwm – speed relation has to be linear without too much variation.
   Contra: A false measurement will suddenly increase the PWM by a lot.

2) We will make a feedback loop where the offset of the distance measured with the sonar module is multiplied by a specific constant and the pwm is increased by this number (which can be negative) every loop.

   Pro: The pwm – speed relation has no implication
   Contra: This will or: not react well to a very sudden change in velocity (small k) or the fluctuation of the pwm will be very large at a near-constant speed (big k)
   Contra: We react to a change in velocity to a change in acceleration. We will always fluctuate around the value.

Test will show out which one is better to use.

For the second part of this study, I will discuss the Scientific Paper

First and foremost, a poster needs to represent the idea of our project. Someone looking at the poster needs to know what our project is about. This is why I think we should start with a [Purpose / Idea / What] section where we explain what our project actually is.
This should not contain any information on how we worked or what our results are, just the concept.

After this brief introduction, we should talk about the goals of the project. What problems it will solve / how it could be used in the real world and the future of the project. This could also be included in the first point.

Next up, the people will be interested in our project so we need to give them some information. We could say how we established this idea in very broad lines. We shouldn't be discussing which MCU we used and what information is in the packets but keep it very simple.

We could also introduce our team and who established what. This could also be left for later or just totally left out.

Now we need to prove our project. We should show some graphs or something to make it a bit visual. We could show the reliability with some tests or something.

In short:
1) What
2) Goal, Solution to what problem, Real world and future.
3) How it works
4) (Maybe introducing the team?) Tests, results and reliability
5) Conclusion

An example could be

1) This project establishes a safer traffic by making the cars smarter and expand their information range to the cars surrounding them. It also includes the logging of traffic information and control of cars through a main server.

2) The early goal is to prevent traffic accidents and to better regulate the traffic. Later on, we could think about the possibility of the main server controlling self-driving cars and optimising the traffic to reduce traffic jams.

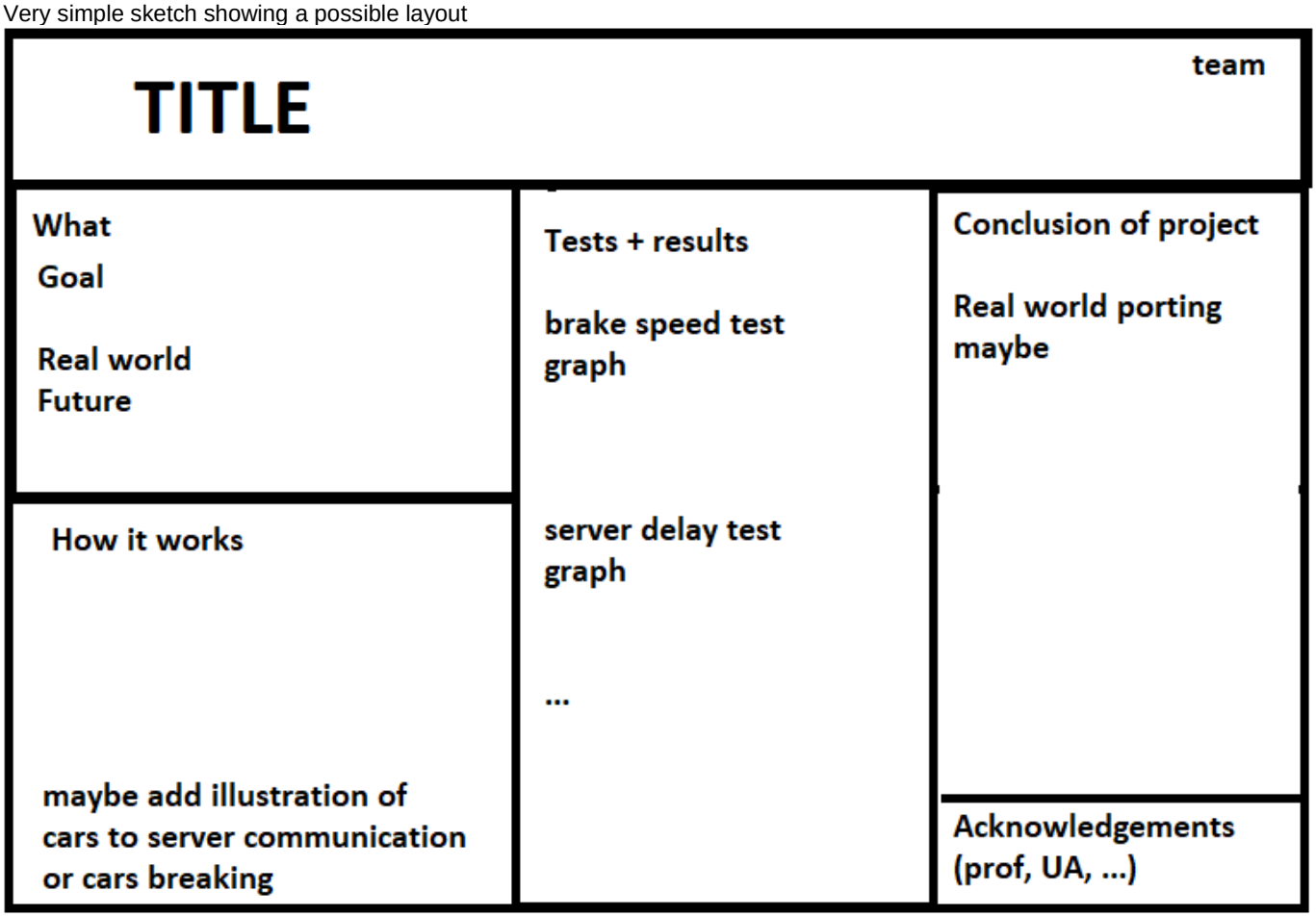
3) The cars measure the distance of the other cars and change their speed accordingly. All the information is also sent to a main server who collects all the data and can determine the traffic more precisely. This main server can also send commands to each car to for example break or accelerate.

4) We could add a graph which plots the speeds of the different cars (2 lines and when one car breaks, how fast does the other one break).

5) This can only be done when we have our test results. See later. We could also mention in our conclusion how we will achieve specific things in the real world (connection with server through satellite, distance measuring through information we get from the server instead of the sonar modules, ….

Things to think about
Should we change the title? Maybe 'smarter cars' or 'decentralizing intelligence in cars', I don't know.
Because the car to car communication is not a good title anymore.
We should write a specific goal of our product.

Very simple sketch showing a possible layout



Referencelist

None