

Cognitive Robotics

Lab 1

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1 How is the argument passed on?

The argument is passed on from the BraitenbergABCD.html using the id: vehicleSelectBox, and using the element "<options>" to the javascript file. Here you can get the options from the html file by using the method: document.getElementById("vehicleSelectBox").selectedIndex. There the options get converted to case numbers (e.g case 0 = aggression, 1 = Fear, 2 = Love, 3 = Exploration).

2 Manipulating the sensor locations.

The sensor work similar to how our eyes work. The closer you put the sensors together, the more overlap they have. The problem is that, if you put the sensor too close to each other, it starts to lose a sense of depth and will not differentiate correctly between left and right. In this case the robot does not detect the light unless it is almost right in front of it.

On the other hand, if you place the sensors too far apart from each other they will not have enough or even any overlap at all. In that case only one wheel will be activated at a time since only one sensor can detect the light. If you place the sensors further apart, but not too far, the robot will react to the light sooner.

To conclude, the position of the sensors should be at a place where they are not too far apart, so they do still have some overlap, and not too close together, where they can not differentiate between left and right.

3 Implementing the four different Vehicles.

There are four different vehicles:

1) Aggression:

Aggression was already implemented.

2) Fear:

Fear is the same as Aggression with the only difference being the wiring of the wheels to the sensors. The sensors were on the same side of their wheel. We did this by positioning the right sensor to $\frac{1}{4}\pi$ and the left sensor to $-\frac{1}{4}\pi$. This gives the effect of the vehicle driving faster to avoid the light.

3) Love:

Love slows down the vehicle more if there is more light, we did this by setting the strength -0.1, also making the speed multiplier higher so the vehicle drives faster and by setting the wiring of the wheels to the sensors to the same configuration as fear. This gives the effect of the vehicle driving slower towards the light

4) Exploration:

Exploration has the same type of wiring to the sensors as aggression, but with the strength and speed changes of love. The only difference between aggression and exploration is that the exploration vehicle slows down more if it detects light. This results into the vehicle driving faster away from the light, and slower near the light.

4 Reflection on the assignment.

1) Driving backwards:

When trying to implement exploration and love, we set the strength to -1 on both wheels, this resulted in the vehicles going backwards. We realized that this is because strength -1 is stronger than the wheels going forward. The solution: set the strength lower, for example -0.1 that way the strength of -0.1 is weaker than the wheel going forward. This means that the wheels going forward are lightly being pushed backwards and that results in braking more when there is more light. To make the simulation go a little faster we also made the speed multiplier higher.

2) Sensor positioning:

We tried all sorts of positions for the sensors and came to the conclusion that a small gap between the positions gives the vehicle a small view, resulting in the vehicle having a harder time to detect light. A big gap will not have any overlap and one wheel will be activated at a time. So we came to the conclusion that $\frac{1}{4}\pi$ is by far the best angle to have the sensors at.