2011

Education and Culture DG

Lifelong Learning Programme

LEGO MINDSTORMS Challenge

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The Problem

We have been given the assignment to build a robot in "Lego mindstorms", which will be able to follow different tracks using sensors. It must have precision so that it may drive as fast as possible on the tracks. To do this we have been given all the necessary materials from "Lego mindstorms" like motors, different sensors, different Lego parts and of course the program: "Lego mindstorms" that is used for programming the robots. We wish to build a robot that will be able to drive fast, accurately and navigate through various obstacles on its way.

Presentation and detailing of chosen solution

Our robot did not turn out exactly how we had hoped it would. Some of the reasons for that was coursed by a lack of time, this was especially due to the groups lack of experience with programming. As we have mentioned earlier we hoped to make our robot so it would be able to navigate through various obstacles on its way. It was planned to make an extra machine that could help our robot do that. This machine actually was made, but because of the lack of time we did not install it to the robot. Regarding our wish about a fast robot did not work as well as we anticipated. This does not mean that our robot is super slow, but compared to the other robots in the project it cannot keep up with the others. We have tried a lot when we have been programming. Every time the robot actually worked it did not drive fast enough in comparison to the other robots. Then we tried to improve it by changing some of its physical parts, and program it in a different way, but every time we did so it could not drive as accurately anymore. After a lot of these experimental versions we accepted that we were not able to make it the way we wanted it to. This has resulted in a robot that can drive accurately at a medium speed. This is probably not enough to beat the others, but we think it may be better to drive accurately than fast.

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Product development: Documentation of work

Materiel list

Engine	Mini computer	Saund sensor	Ultrasound sensor
Light sensor	Electricbricks	Wheels	Lego parts

Documentation of work

Monday morning we started to build our robots. A lot of ideas was tried on, so that we could make the robot that we wanted.

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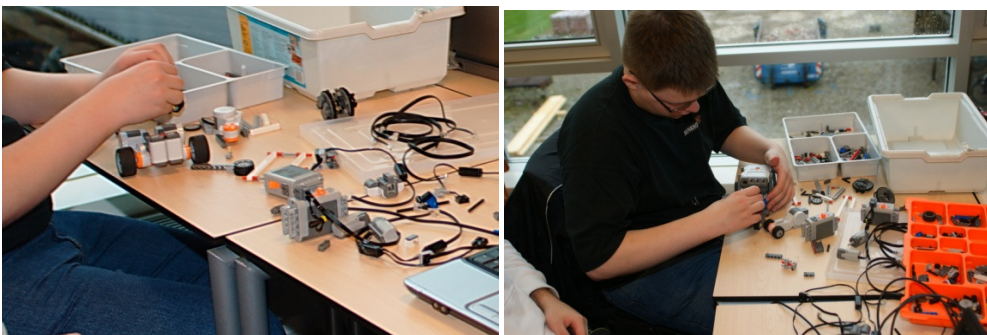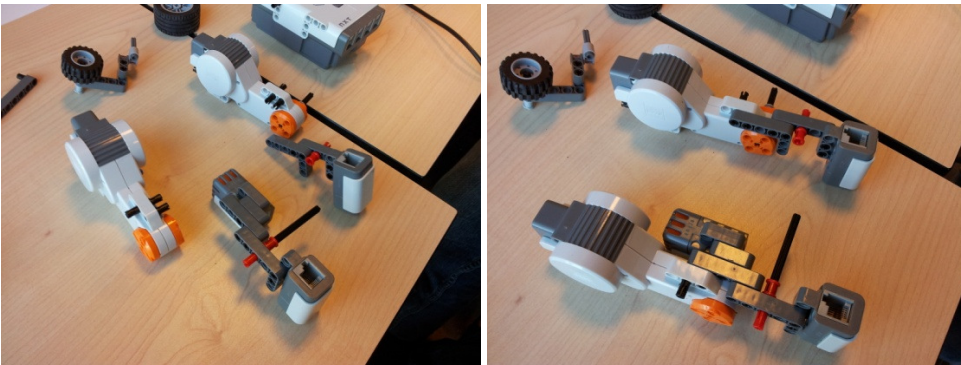
We chose which sensors we would like to use.

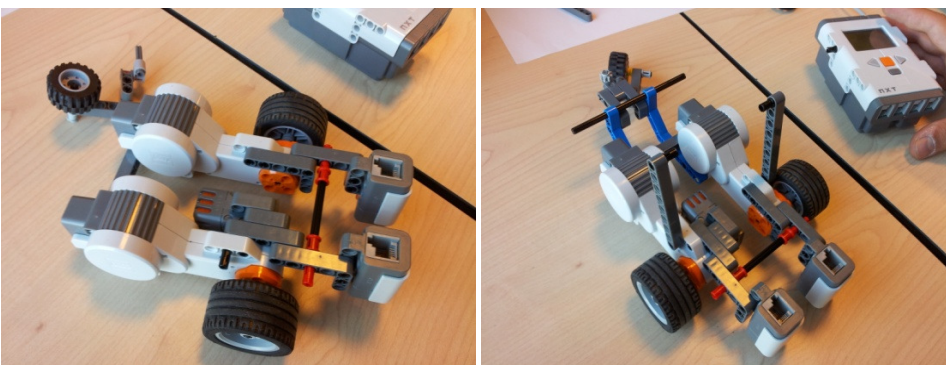Ultrasound sensor, sound sensor and light sensor.

We started to build our robot from the engines.

The first step was to put on the light sensors, so that the robot would be able to drive accurately. We also placed a sound sensor that would make it drive when we made a loud sound.
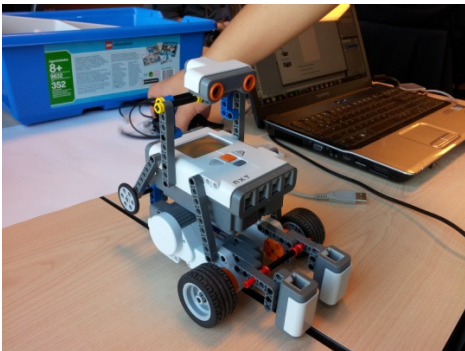

The next step was to put some wheels on both in front and in the back, to make it able to drive.

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Afterwards we connected the minicomputer which is the most important part of the robot. It's the minicomputer that we are programming, so that the robot will work.
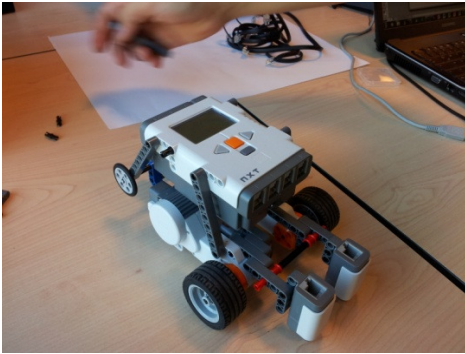
In the end we placed a ultrasound sensor on the top of the robot. This sensor do not have eny function on our robot, it is only placed there to give the robot some personality.


Our robot in a finished version.

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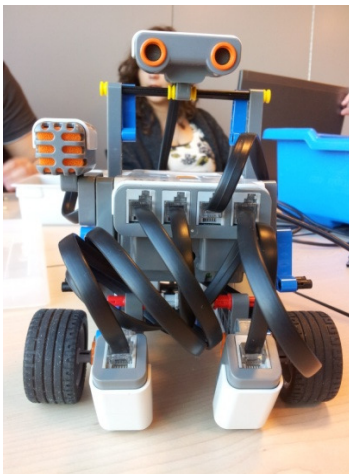
The programming

We started with the light sensor to drive the parcour. The program do that the robot followed the black line because of the sensors. While the left sensor is over the black line the Robot will move to the right. It is the same for the other side. Then we program some extras like sounds and display outputs and that it start running when you clap your hands.

The light sensors are at input 1 and 2 , the sound sensor at input 3 and the ultrasonic sensor at 4.

The engines are at output A and B.
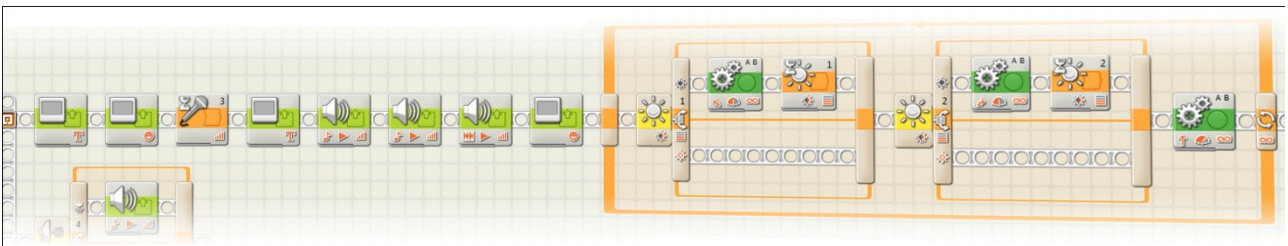
Conclusion on the product and the project

Our robot is not as we thought it would be. It did not reach our expectations of speed and it is not able to operate on a field with obstacles as we had planned for it to do, but in the aspect of accuracy it has fulfilled our expectations. Its not perfect, but I works, and that is the most important thing.

In our group we have been dividing the work a lot between us. We have not been very good at talking about the details of what we were doing, but in the end we have been good at helping each other with the report so that we wouldn't miss anything.

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