Autonomous Vehicle

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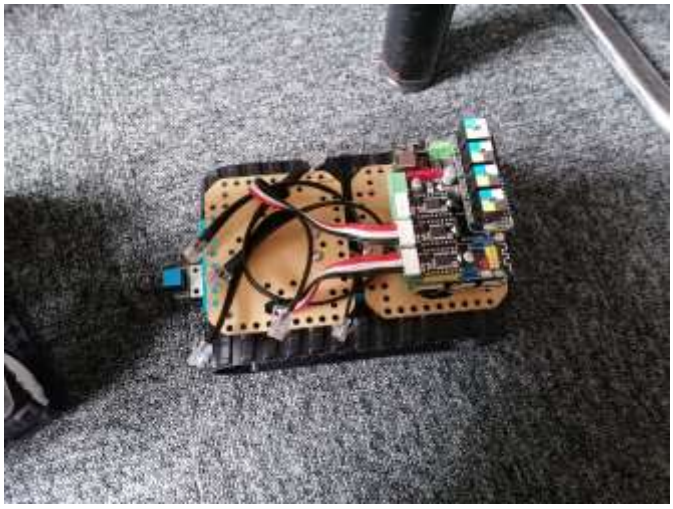
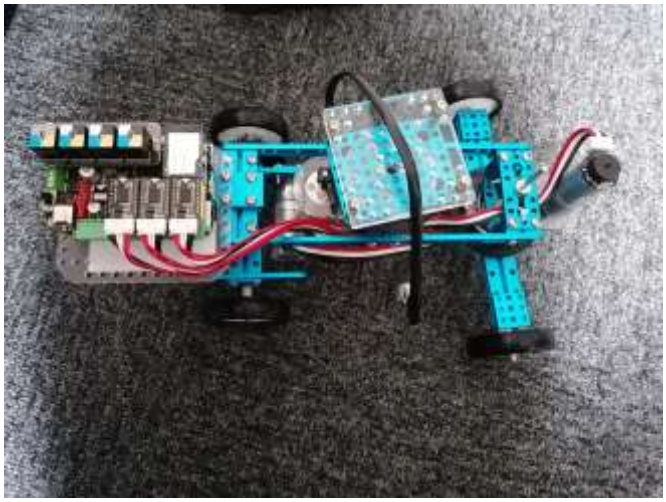
Goal: Develop a prototype illustrating the concepts of an autonomous car

Subject:
The goal of this project is to create a robot which explores its environment and builds a map of it. The idea is that the robot moves in various directions, takes snapshots of the environment using lidar sensors and combines it into a map. Later on, the map can be used to give instructions to the robot to move to a certain point in the space. During the exploration phase, the robot should be able to detect and avoid obstacles.





The robot will be based on a lego platform and it will be equipped with a

- raspbery Pi https://www.raspberrypi.org/
- lidar sensors https://www.ydlidar.com/, https://www.slamtec.com/
- Arduino/MegaPi microcontroller https://www.arduino.cc/ http://learn.makeblock.com/en/megapi/ .

You will have to use the microcontroller to drive the robot to the desired direction and use the lidars, and other sensors to map the environment and to possibly detect obstacles.

You may want to use the ROS software package to build and use maps (https://www.ros.org/)

During the project you are encouraged to suggest other sensors (camera, ultrasound sensors, etc.) or platforms.