

RWTH Aachen University - LELY Challenge Documentation

RWTH Team

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1 Robot A

1.1 Overview

Robot A is a LIDAR-capable platform. Due to the walls of the challenge being only 37cm tall, the mounting point of the LIDAR is on the bottom front of the chasis, providing a 200 degree field of view.

PICTURE OF COMPLETE ROBOT

1.2 Sensors

A RPLIDAR A1M8-R6 LIDAR is mounted on the front of the robot. The LIDAR interfaces with the laptop directly over USB.

OFFICIAL PICTURE OF LIDAR

1.3 Hardware

A 3D-printed mount was created for easy placement and adjustment of the LIDAR.

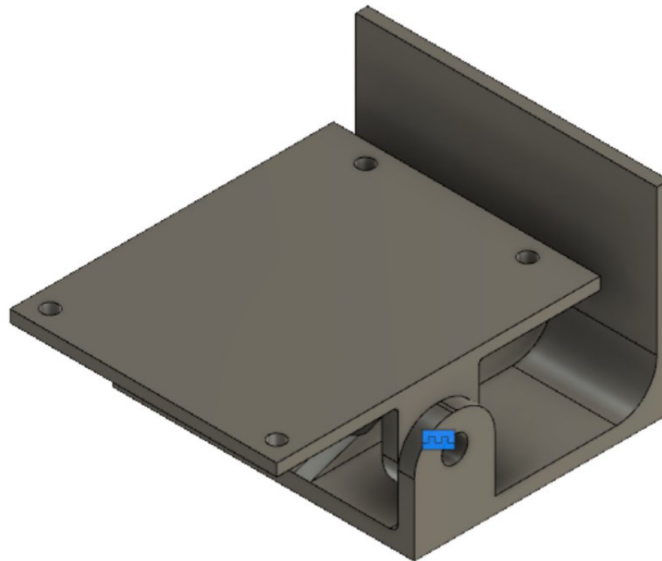


Figure 1: CAD rendering of LIDAR mount

1.4 Software

Robot A implements a wall following algorithm. Five equally-spaced lines in front of the robot are sampled via LIDAR.

2 Robot B

2.1 Overview

Robot B uses ultrasonic sensors mounted via aluminium frame to navigate its environment.

PICTURE OF COMPLETE ROBOT

2.2 Sensors

Three HC-SR04 ultrasonic sensors are placed ??somewhere?? around the robot. The sensors interface with the laptop via an Arduino Uno.

OFFICIAL PICTURES OF SENSOR AND ARDUINO.

2.3 Hardware

An aluminium frame with 3D-printed connection points extends from the top mounting point to the bottom of the robot, allowing the sensors to attach to a low-enough point to read the walls of the maze.

PICTURE OF FRAME.

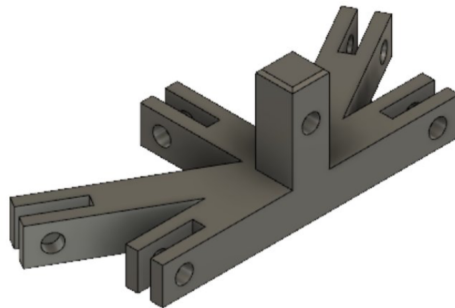


Figure 2: Central mount for connection points

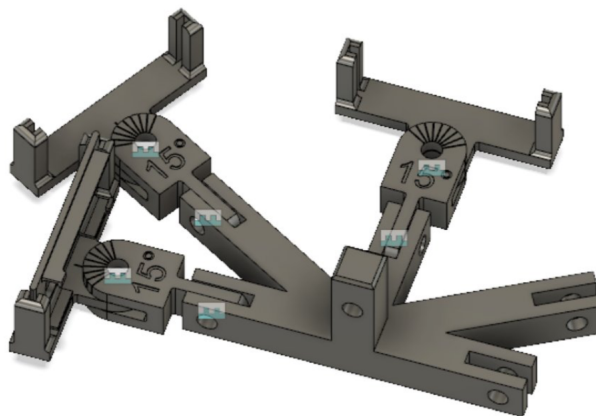


Figure 3: Central mount with connections for ultrasonic sensors

2.4 Software

DESCRIPTION OF SOFTWARE