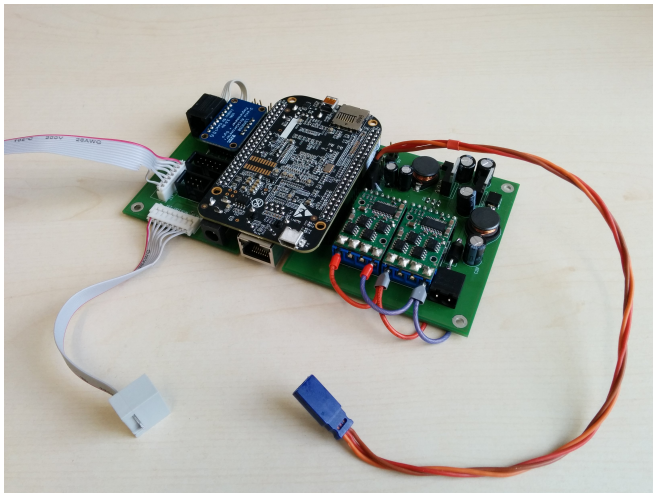




Progress Report

New Actuator Control Board



Why Beagle Bone Black?

Features

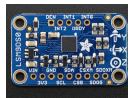
- ◇ Communication via Ethernet
- ◇ ROS and Software running on Ubuntu
- ◇ Pluggable Components

Connectors:

- ◇ 33x digital I/Os, 4x PWM, 4xADC
- ◇ SPI, CAN, and I2C Bus
- ◇ Ethernet, USB, HDMI
- ◇ SD-Card Slot

External Components

- ◇ Inertial measurement unit (Adafruit LSM9DS0)
- ◇ Light barrier with IS471 and IR-LED
- ◇ High power motordriver
- ◇ Optical Flow Sensor
- ◇ Servomotor



In Progress: New charging mechanism for the capacitor

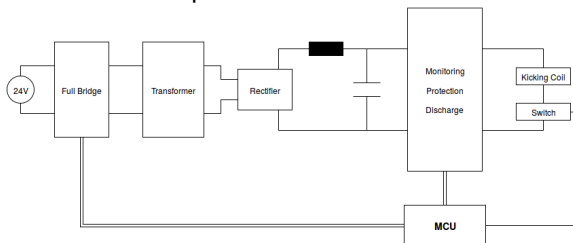
Idea: Charging the Capacitor with a transformer

Possible advantages:

- ◇ Capacitor is charged more quickly
- ◇ Galvanic isolation / more safety
- ◇ More energy-efficient

Disadvantages:

- ◇ More weight
- ◇ Lack of experience



Localization

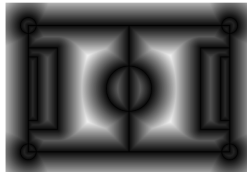
Idea: Using gradient descent in the particle filter

Possible advantages:

- ◇ Global localization
- ◇ Low computational power needed
- ◇ Precision

Open questions:

- ◇ How selecting number of gradient steps and particles?
- ◇ Is it really better?

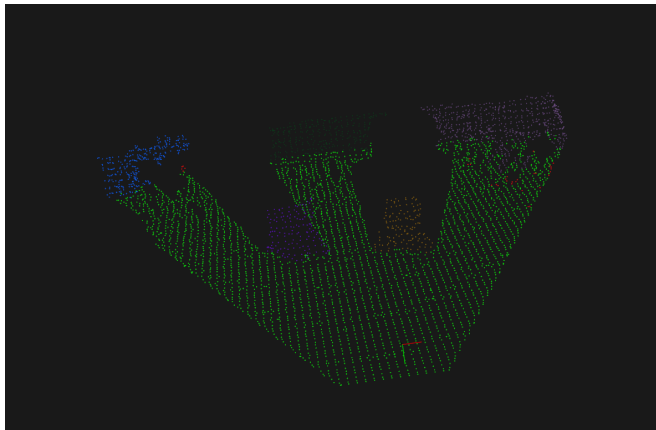


Simple Depth Based Obstacle Detection

Approach:

- ◇ Detect the ground plane
- ◇ Compress camera data by computing a voxel grid
- ◇ Remove all voxels close to the ground plane
- ◇ Clustering the remaining voxel through a distance metric

Result





Thank you for your Attention! Questions?