Simultaneous Localization and Mapping (SLAM)

# Robots

## SLAM team at university of Michigan with a robot in an artificial environment

### “It uses the April Labs graph SLAM to correct maps and a frontier exploration algorithm with A\* to navigate.”

#### <https://www.youtube.com/watch?v=_uhOLz47t7E>

## Autonomous car that “uses a stereo camera (and no other sensors) to detect obstacles and localize itself)”

#### <https://www.youtube.com/watch?v=Q1ipn42rMh8>

## Autonomous robot “Obelix” driving on campus (Institue for computer science, University of Freiburg, Germany)

#### <https://www.youtube.com/watch?v=ASvGVL3xf14>

## 2D mapping robot on LabView

#### <https://www.youtube.com/watch?v=IlyMhB8sTDI>

## Simulation of 2D mapping

### with playerstage and opencv

#### <https://www.youtube.com/watch?v=zOj4s9TEmg8>

# Commercial robots

## Commercial mapping system by (University of Freiburg and tele rob GmBH)

#### <https://www.youtube.com/watch?v=MtdxXxeK2rs>

## Robot vacuum cleaner (Samsung Hauzen RE70V)

### using CV-SLAM (Ceiling-Vision based Simultaneous Localization and Mapping)

#### <https://www.youtube.com/watch?v=bq5HZzGF3vQ>

## “Kuka” Robot autonomous navigation

### (industry level, e.g. factories)

#### <https://www.youtube.com/watch?v=9WNE3JAcO6U>

# Sensors

## Lidar (RPLiDAR by RoboPeak)

### mapping done using Hector SLAM algorithm

#### <https://www.youtube.com/watch?v=gy9cDuaNW1w>

# Education and Resources

## SLAM course by University of Freiburg (Germany)

#### <https://www.youtube.com/playlist?list=PLgnQpQtFTOGQrZ4O5QzbIHgl3b1JHimN_>

#### <http://ais.informatik.uni-freiburg.de/teaching/ws13/mapping/>

## OpenSLAM

### Algorithms and other resources

#### <https://openslam-org.github.io/>

## ROS (Robot Operating System)

### With packages for localization and mapping

#### <http://www.ros.org/>

# Advanced

## 2D grid mapping with ORB-SLAM 2- KITTI Dataset

### By using ORBSLAM and only monocular camera we were able to create a 2d occupancy grid map to eliminate the use of lidar to some point.

#### <https://www.youtube.com/watch?v=FCd6p25131I>

# Talks

## A talk about using Lidar on a robot

### (only good for some overview)

#### <https://www.youtube.com/watch?v=OJNNm6iMOKk>