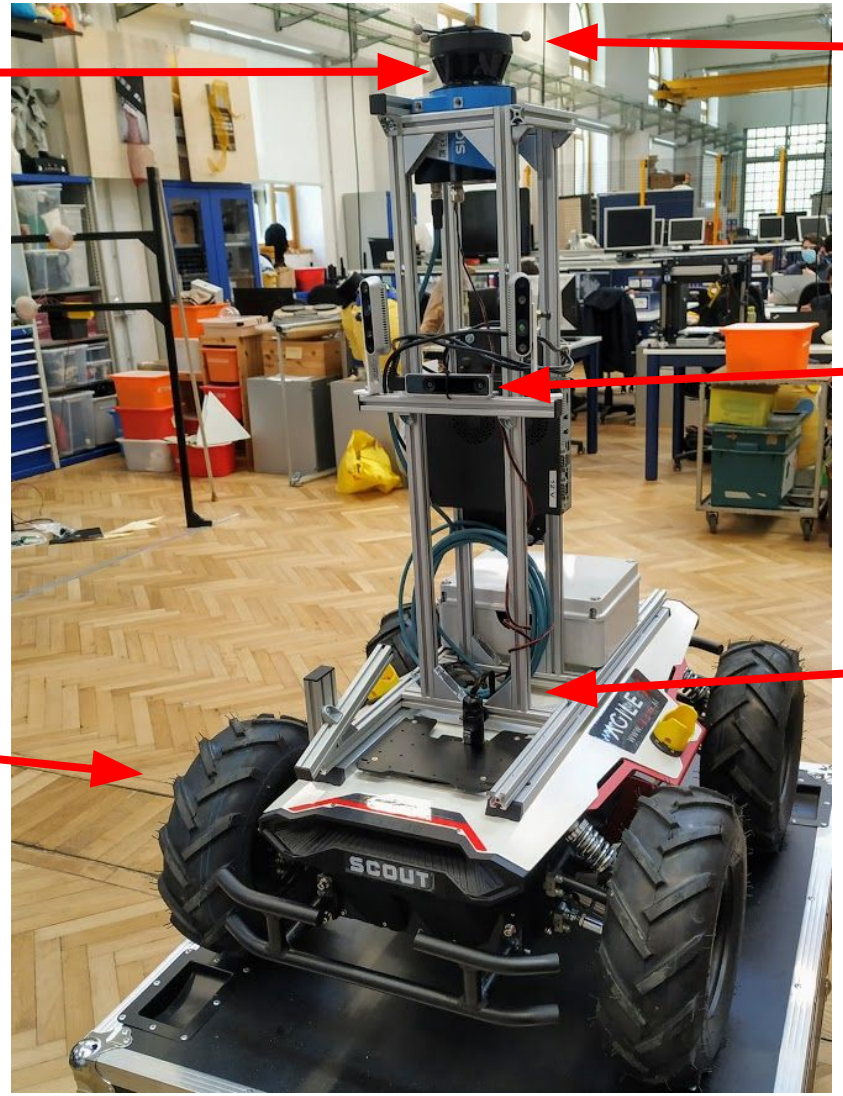
SECOND ROBOTICS PROJECT

ROBOTICS

POLITECNICO
MILANO 1863

THE ROBOT



SICK LMS100

Optitrack Markers

Intel T265

pixhawk mini

Agilex Scout

DATA

Format: ROS Bag file

Data: bag files

Topics:

- /Robot_1/pose: gt from optitrack (not always available)
- /camera/accel/sample: camera IMU
- /camera/gyro/sample: camera IMU
- /camera/odom/sample: camera Odom (visual odom+IMU)
- /mavros/imu/data_raw: IMU data (cog mounted)
- /odom: scout odometry
- /scan: laser data
- /scout_status: scout status
- /tf: some tf

THE PROJECT

- **Small bag** (calibration.bag)
- use only for sensor calibration (estimate missing tf)

- Choose **one bag**
- use the data to create a map using gmapping

- Configure robot localization, imu_filter, amcl
- Perform localization on the **other bags** using the recorded map

THE PROJECT

- The map can be created using **directly the odometry** or with the **output of robot localization**
- odometry and laser are **not aligned** , there is a rotation between them (use calibration bag to estimate it)
- **Localization** need to be performed with **amcl+robot localization**
- Use the best sensor setup to achieve accurate localization (**min two sources** in robot localization)
- you can use imu_tools to preprocess imu data (not mandatory)
- We employed commercial sensors, for question regarding mean error, max distance, etc. you can **refer to the datasheet**

Deadlines and requested files

-Send **only** a tar.gz file (put the .txt file with info inside the archive)

-Send via e-mail both to Simone Mentasti, Paolo Cudrano and Matteo Matteucci

-name the e-mail “SECOND ROBOTICS PROJECT 2021”

-Inside the archive:

- -txt file (details next slide)
- -folders of the nodes you created (with inside CmakeLists.txt, package.xml, etc...)
- -all used lauchfiles
- -folder with the created map
- **-do not send** the entire environment (with build and devel folders)

Requested launch files

- Launch file for gmapping to compute the map

- Launch file for robot localization+amcl

I should be able to create a map and start amcl+robot localization with the launch files, include everything in there (i.e., static tf, use_sim_time, rviz, etc.).

You can assume I will start:

- the bag file in a new terminal
- the map server to save the png image (for the gmapping task)

Deadlines and requested files

File txt must contain (at least):

- ID, name, surname of all team members
- small description of the files inside the archive
- structure of the tf tree
- name of the bag used to create the map and bags to test
- description of how to start/use the nodes
- small report to explain the sensors choice (why you used a specific sensor in robot localization, and how you setup the config matrix, why some true and some false)
- info you think are important/interesting

Some more requests

Insert in the archive all the file you think are important, i should be able to properly recreate your workflow

Name the archive with your ID

Don’t use absolute path

DO NOT SEND THE BAG FILE

Deadlines and requested files

Deadline: 27 June

Max 3 student for team

Questions:

-write to me via mail (simone.mentasti@polimi.it)

- do not write only to Prof. Matteucci

-ask on Teams