

# FIRST ROBOTICS PROJECT

ROBOTICS



**POLITECNICO**  
MILANO 1863

# THE CAR





# THE PROJECT

- Compute two different odometry:
  - using Differential Drive Kinematics
  - using Ackerman model
- and publish both as tf and odom topic
- Use dynamic reconfigure to switch between different published odometry
- Use dynamic reconfigure to reset the odometry to (0,0) or to set to a specific starting point (x,y)
- Publish a custom message with odometry value and type of source

# THE DATA



Bag file with:

- left wheel speed (m/s)
- right wheel speed (m/s)
- steering angle (deg)
- other data not useful today

Custom message prototype

Car data:

rear wheels baseline: 130 cm

distance from front to rear wheels:  
176.5 cm

steering factor: 18



<https://goo.gl/GonArW>

**Project** folder



## 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 and Matteo Matteucci
- name the e-mail “FIRST ROBOTICS PROJECT 2019”
- Inside the archive:
  - txt file (details next slide)
  - folders of the nodes you created (with inside CmakeLists.txt, package.xml, etc...)



# 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
- name of the parameter to change odometry source/set/reset position
- structure of the tf tree
- structure of the custom message
- description of how to start/use the nodes
- 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**

**The project need to be written using c/c++ (no python code)**





# Deadlines and requested files

Deadline: 29 May (3 weeks)

Questions:

- write to me via mail ([simone.mentasti@polimi.it](mailto:simone.mentasti@polimi.it))
- do not write only to Prof. Matteucci

Slack channel:

[https://join.slack.com/t/robotics2019-group/shared\\_invite/enQtNjE5MTE0NTI1Nzc4LTUzMzIxODY4ZWZjMWZjNjE1Y2NjOTBiOWJhODA4ZDhhOTU3ZjlkODE0ZjRmODhhNmYONjQzNGZkYzE4ODg4ZTM](https://join.slack.com/t/robotics2019-group/shared_invite/enQtNjE5MTE0NTI1Nzc4LTUzMzIxODY4ZWZjMWZjNjE1Y2NjOTBiOWJhODA4ZDhhOTU3ZjlkODE0ZjRmODhhNmYONjQzNGZkYzE4ODg4ZTM)



## Additional info based on received question

- The Steer\_stamped topic is registered directly on the steer, to retrieve the wheels angle you need to divide it by the steering factor 18
- You can assume I'll start the bag file, so you don't have to start it in a launch file
- Publish the odometry using nav\_msgs/odometry
- You can choose the name of the topic on which you'll publish the topics, but don't use name of already published topics, otherwise the message will mix
- There might be some differences in pose between the two odometry due to small errors in real measures on the car