SECOND ROBOTICS PROJECT

ROBOTICS

POLITECNICO
MILANO 1863

THE CAR

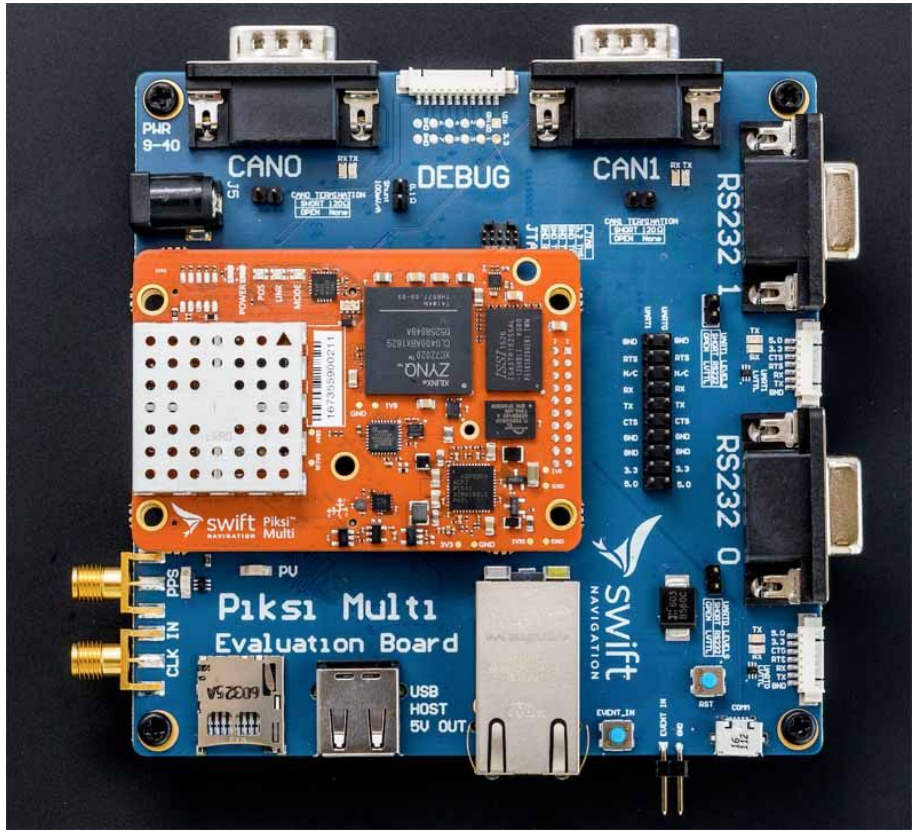

B 23
Regione Lombardia
fesr
teinvein
POLITECNICO MILANO 1863

THE PROJECT

Compute accurate and high frequency GPS position fusing:

- -Odometry (from wheels encoders and steering angle)

- -IMU (Piksi Multi board)
- -GPS (Piksi Multi board)



THE DATA

Bag file with:

`/speedsteer` topic:

- x = steering angle measured on the steering column in degrees (divide it by 18 to get the wheels angle)
- y = speed of the vehicle in km/h

`/swiftnav/rear/imu` topic: imu data

`/swiftnav/rear/gps` topic: gps data

THE DATA

- Write a node to compute odometry from speed and steering angle
- Use Imu_tools package to elaborate IMU data. You can use complementary filter or madgwick filter
- Use robot_localization package to fuse those data and retrieve a accurate GPS position at 30 hz

THE DATA

If you need to add covariances to the topics (most of them have no covariance data), change names, change tf of the topics you can:

- Write a node that subscribe to a topic and republish it with the new data
- Use rosbag API to directly edit the provided bag file

If you edit the bag file you will have to include it when you send the project

THE FILES

https://goo.gl/GonArW

Project2 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 “SECOND 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

-description of how to start/use the nodes

-small description of the parameters used in the launch files

-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). Exceptions can be made on request.

Deadlines and requested files

Deadline: 1 July (3 weeks)

Questions:

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

- do not write only to Prof. Matteucci

Slack channel:

https://join.slack.com/t/robotics2019-group/shared_invite/enQtNjE5MTE0NTI1Nzc4LTUzMzIxODY4ZWZjMWZjNjE1Y2NjOTBiOWJhODA4ZDhhOTU3ZjJkODE0ZjRmODhhNmY0NjQzNGZkYzE4ODg4ZTM

Additional info

- You can assume I'll start the bag file, so you don't have to start it in a launch file
- You can look at the gps data for debug purposes using mapviz, but it plots data with map resolution (~1m), so you won't be able to see smooth lines.
- The bag contains other sensors data, from the second Piksi board, it's not required by the project but if you want you can also integrate them
- The IMU is already correctly placed in the car (g is on the z axis) but you might need some fine tuning on the yaw offset and magnetic declination parameters