



LABORATOIRE  
DES SCIENCES  
DU NUMÉRIQUE  
DE NANTES



# JEMARO days competition

**Elwan Héry, Xavier Koreki**  
École Centrale de Nantes, LS2N (UMR CNRS 6004)

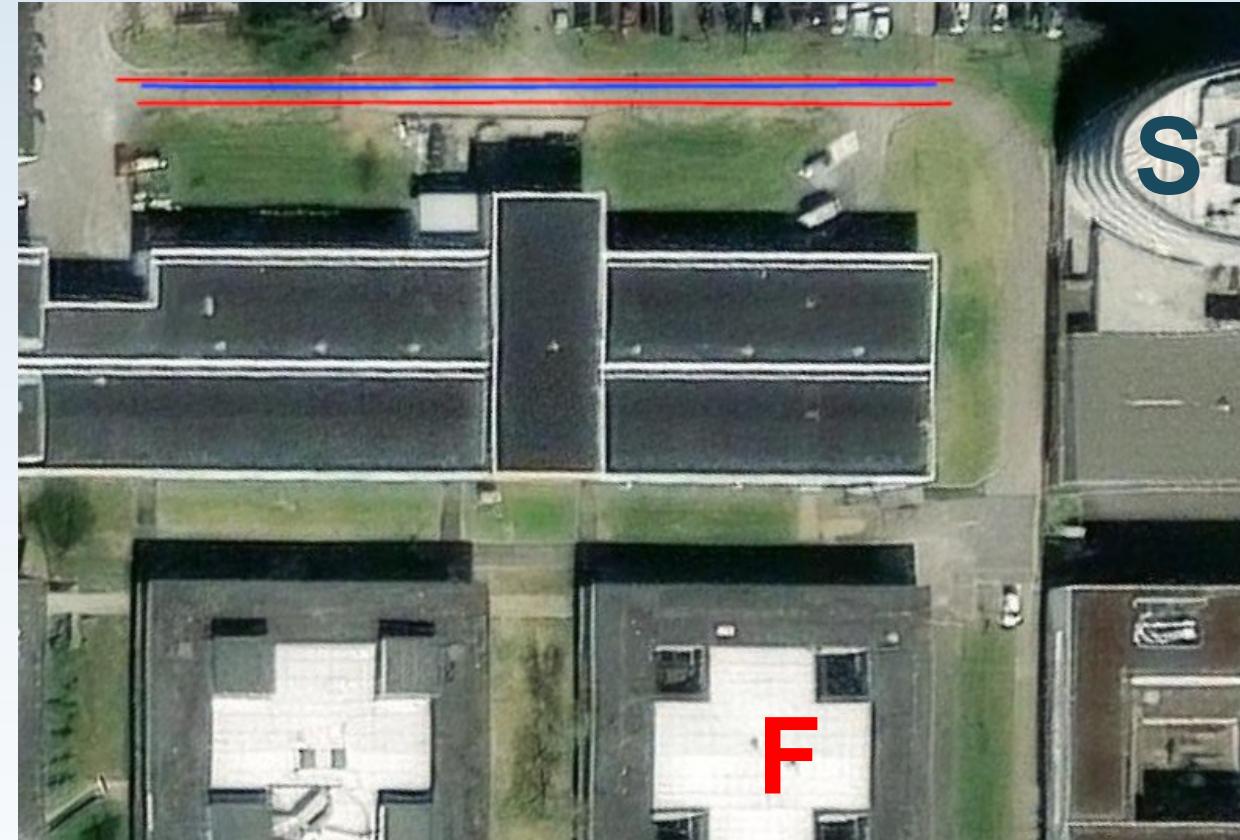
# Obstacles detection and avoidance for autonomous vehicles

- Detection of construction cones
- Path planning to avoid the construction cones



# Organization

- Test on the Gazebo simulator and a dataset in the F robotic lab room (ROS2 Galactic)
- Final test and Evaluation on the robotized Renault Zoé 3 on a road of the École Centrale de Nantes (ROS2 Humble)
- Possible use of personal laptops



# Planning

	Monday 7th	Tuesday 8th	Wednesday 9th	Thursday 10th
09:00		Competition preparation	Competition preparation	Competition preparation
12:30	Competition presentation			
13:30	Competition preparation	Competition preparation	Competition preparation	Competition Evaluation (13:30 to 16:30)
17:30				

# Tasks

- LiDAR detection
- Obstacles avoidance
- Supervision
- Free space detection (optional)

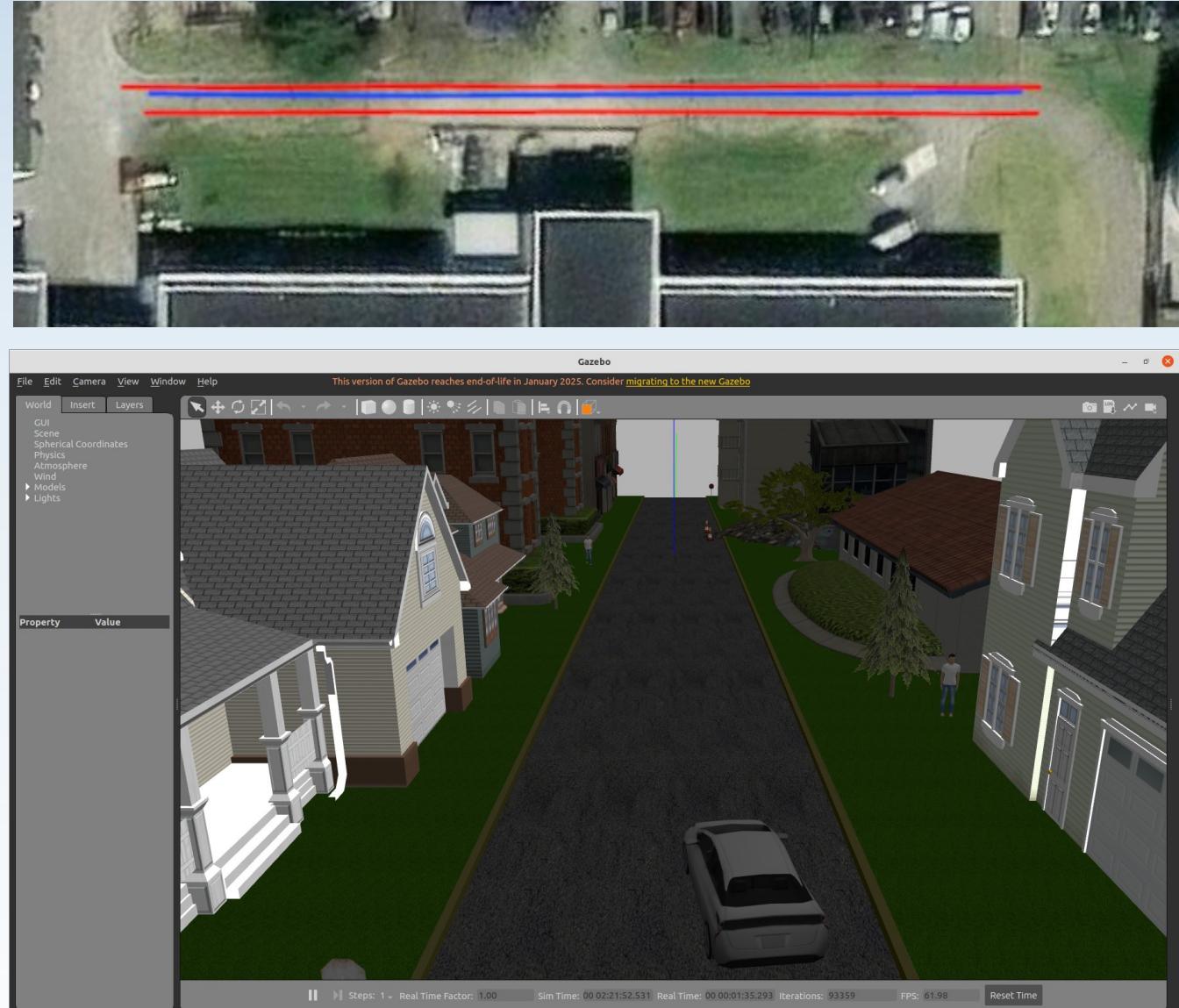
# LiDAR detection

- Goal: Detect the cones
- LiDAR Ouster OS2 rev 7  
128 layers
- Cones position unknown
- Downsampling node available
- Test on a PointCloud2 rosbag



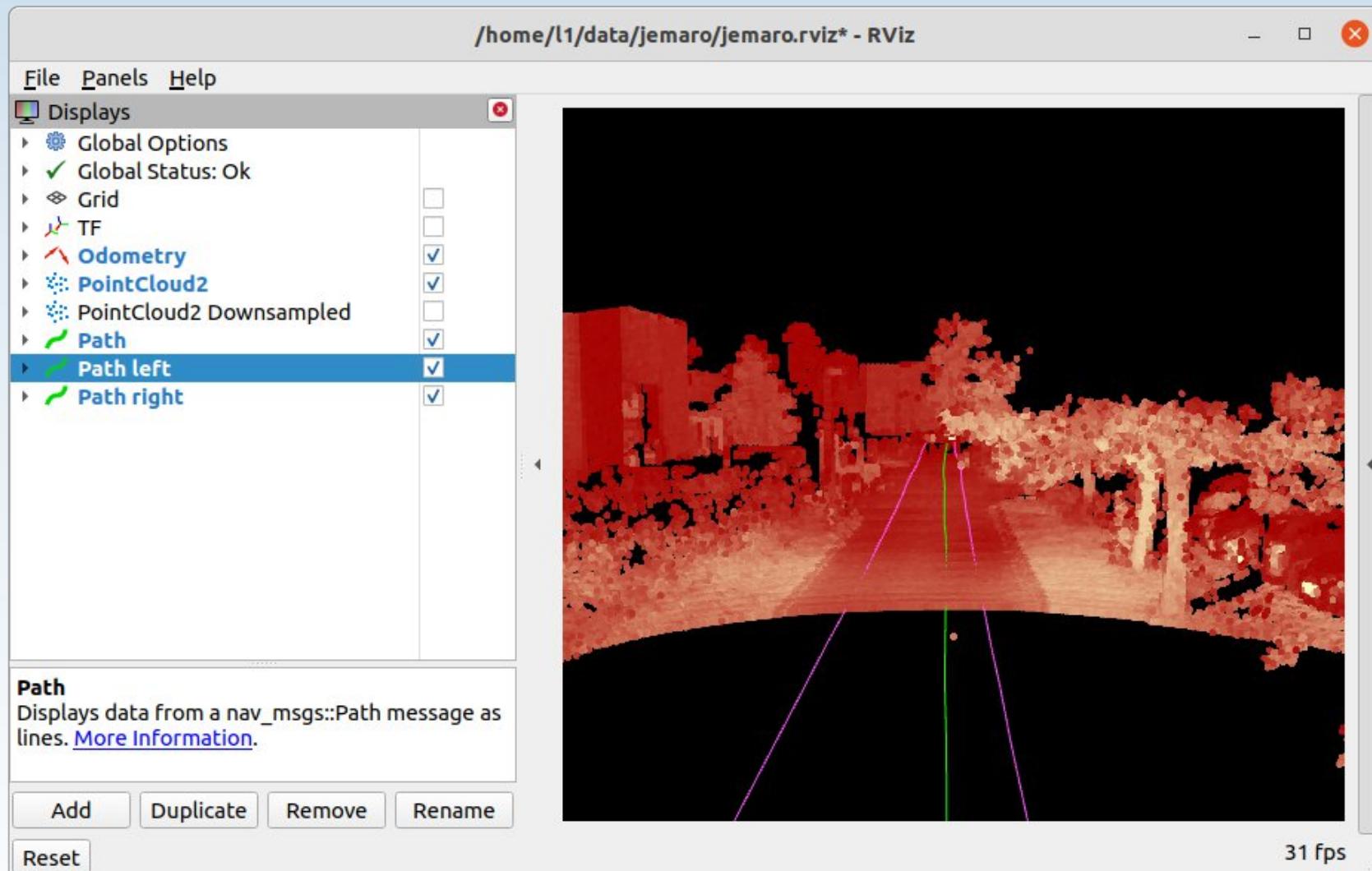
# Obstacles avoidance

- Goal: **Planing of a path to avoid the cones**
- Path following algorithm available on Gazebo and on the Zoé
- Path of the center of the lane available
- Test on Gazebo



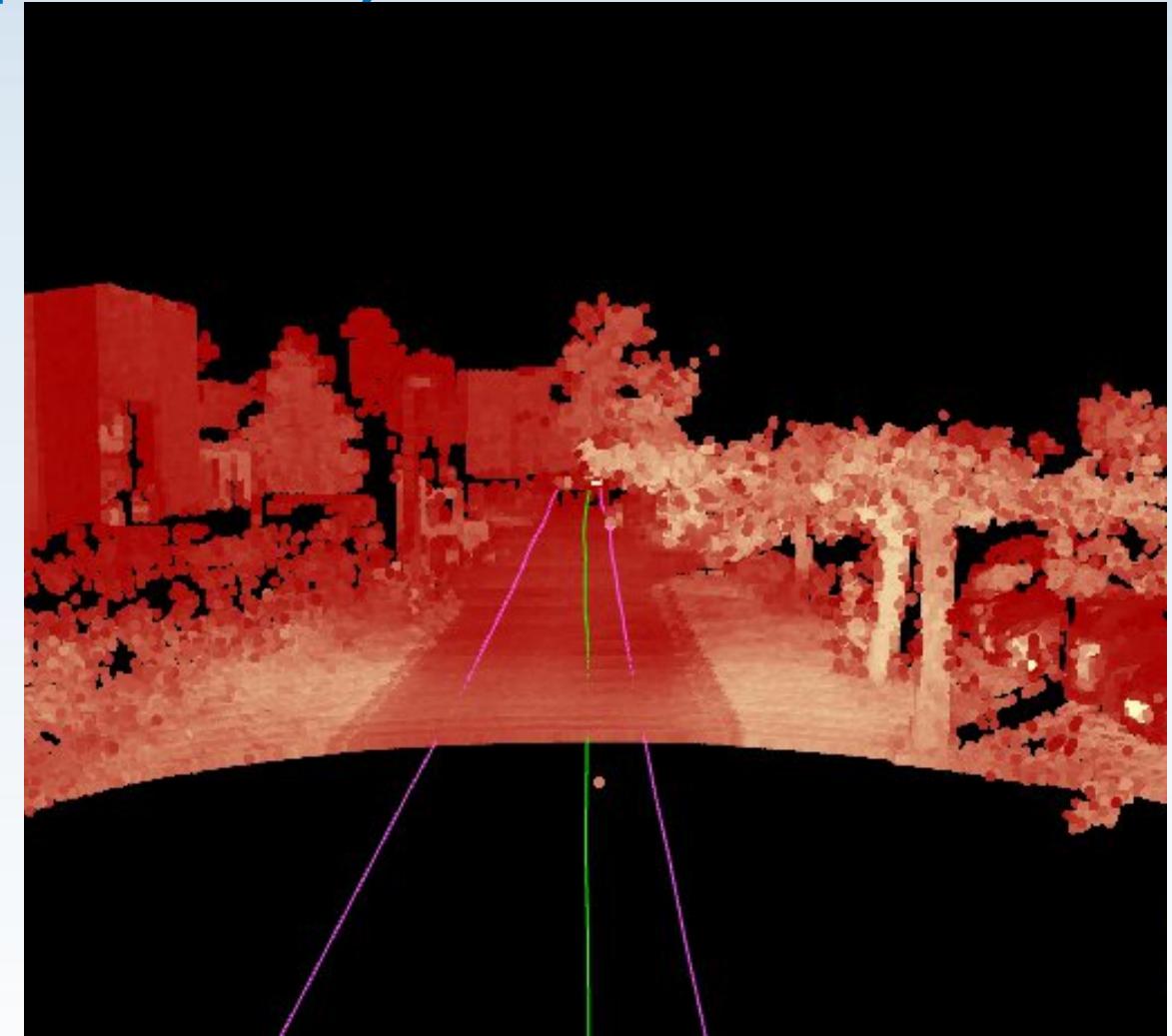
# Supervision

- Goal: rviz interface to supervise the good behaviors of the tasks



# Free space detection (optional)

- Goal: Detect the road
- Available left and right paths for navigable space



# Evaluation

- On the Robotized Renault Zoé
- Cones detected as soon as possible
- Position of cones not lost when not in the field of view of the LiDAR
- Path planning should be anticipated, predictable and comfortable
- Avoid only the area where there is an obstacle
- Bonus points if the vehicle detect the road

# Evaluation

- Short presentation (3 to 5 minutes) to introduced the demonstration.
- Demonstration with graphic interface (rviz) to supervise the good behavior of the different tasks

# Evaluation

- The safety driver can take back control of the car if it is too close to obstacles or a side of the road
- Multiple attempts (around 3 attempts of 10 to 15 minutes depending of the time)
- Evaluation based on the best attempt
- In case of equality the first team will be the one with the minimum attempt



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[https://github.com/ElwanHERY/jemaro\\_days\\_2025](https://github.com/ElwanHERY/jemaro_days_2025)

JEMARO Days July 7-11 2025, Nantes (France)