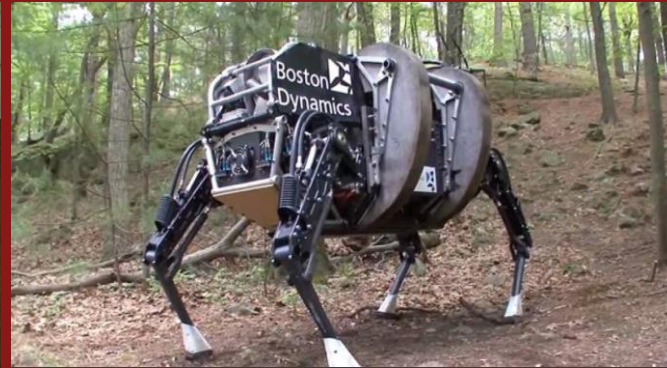# JdeRobot-Academy:

a ROS-based framework for learning robotics in a practical way

Modern Robotics

- Nowadays, there are increasingly more robotic applications for mass public.
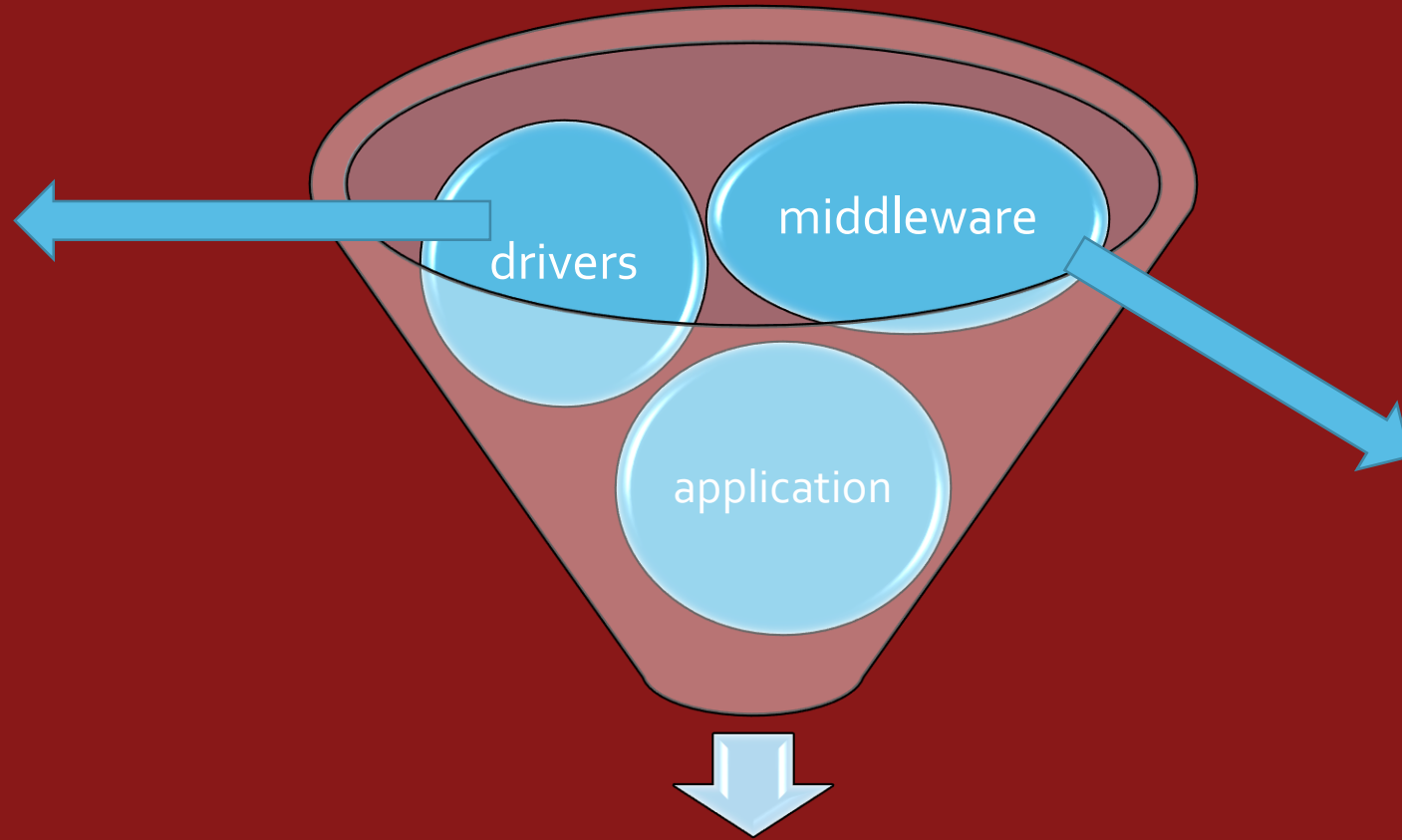

- It is needed to train new professionals in this sector, so that it is possible to create even more applications for the people.
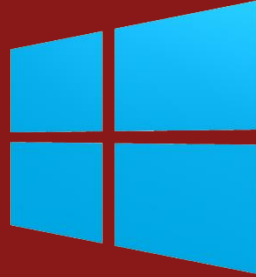
Robotic Software

drivers

middleware

application

ROS

Robot's Intelligence

GAZEBO

JdeRobot-Academy Infrastructure

JdeRobot-Academy in...
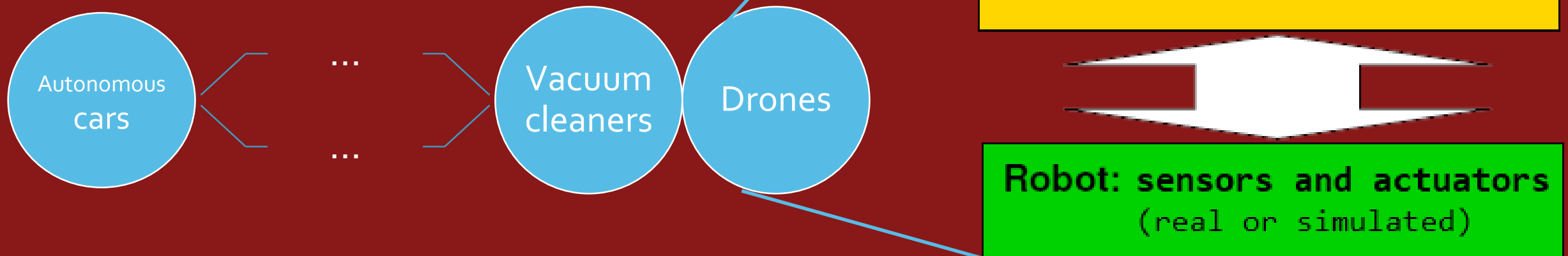
University degrees	Postgraduate programs	Introductory courses in robotics

Universidad
Rey Juan Carlos

What is JdeRobot-Academy

The teaching environment consists of a collection of independent practices that pose a specific robotic problem according to applications that are recently arriving to society.
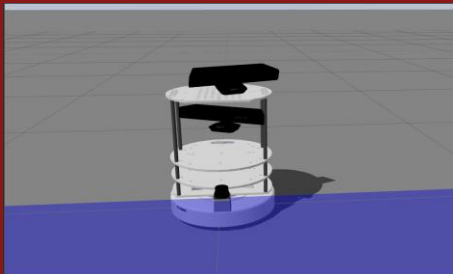
Autonomous cars

…

…

Vacuum cleaners

Drones

Academic Application

Python

Student's Code

Drivers, middleware

Robot: sensors and actuators
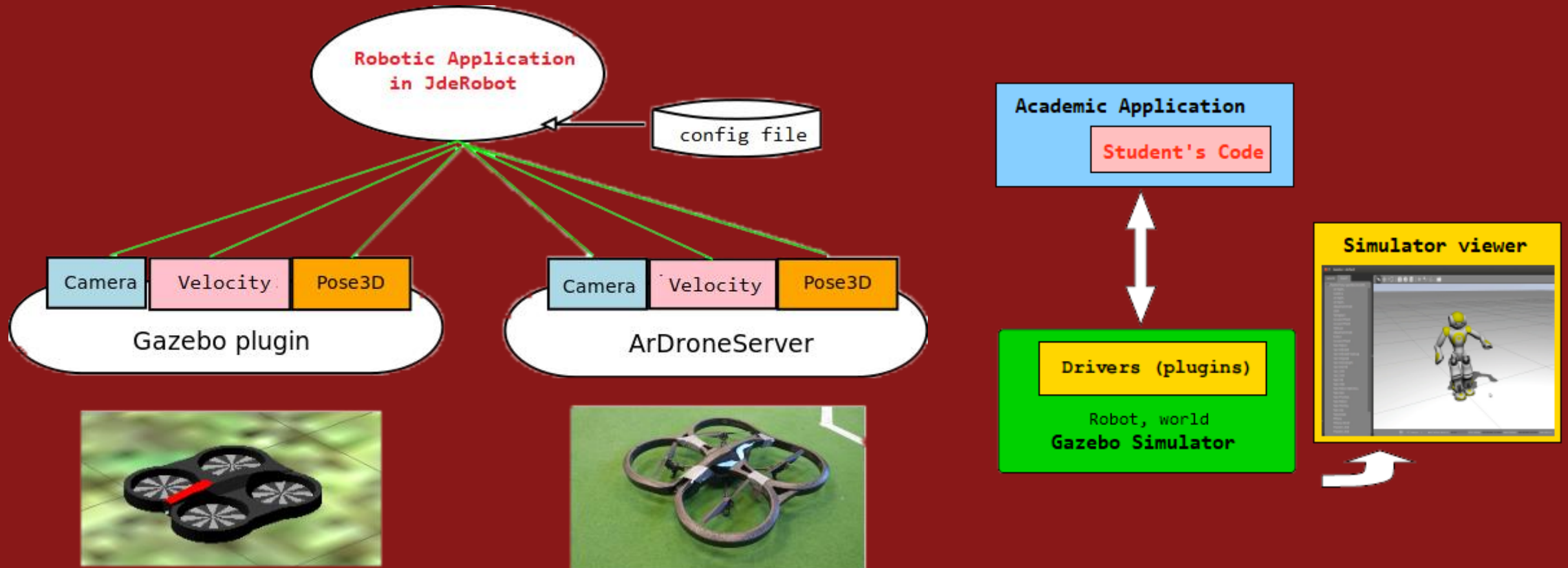(real or simulated)

Lower Layer: Robot

Practices based in varied types of robors, either real hardware or simulated.

- Drones
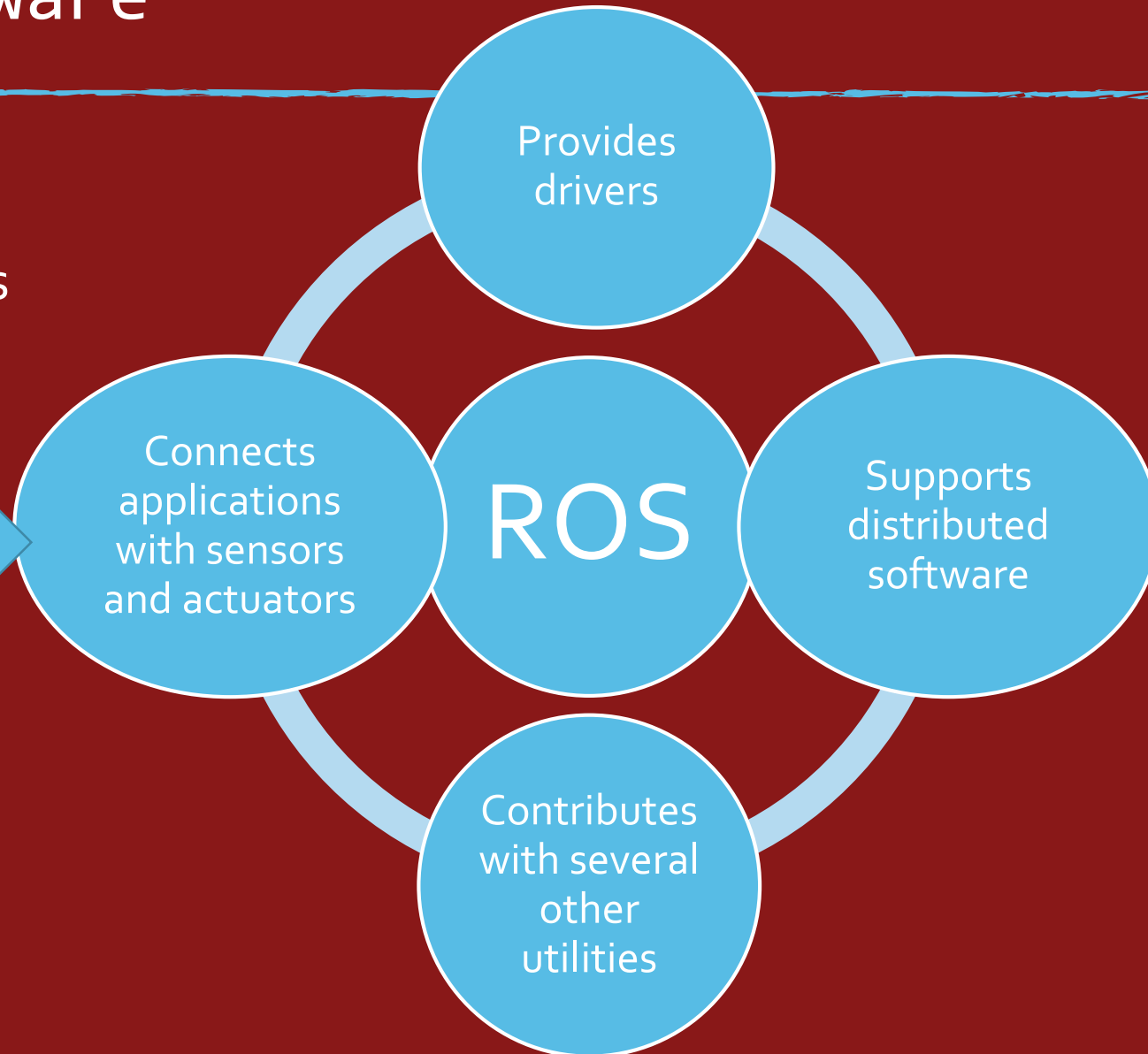
- TurtleBot

- Cars

- Humanoids

- …

Lower Layer: Robot

The academic application will connect indistinctly to the real or simulated robot.

Intermediare Layer: drivers and middleware

Configuration files

Provides drivers

Connects applications with sensors and actuators

ROS

Supports distributed software

Contributes with several other utilities

Upper Layer: Academic Application

For each practice an academic application is created that contains one part already programmed and another part that must be filled by the student.

GUI API

Student's Code

HAL API

Academic Application
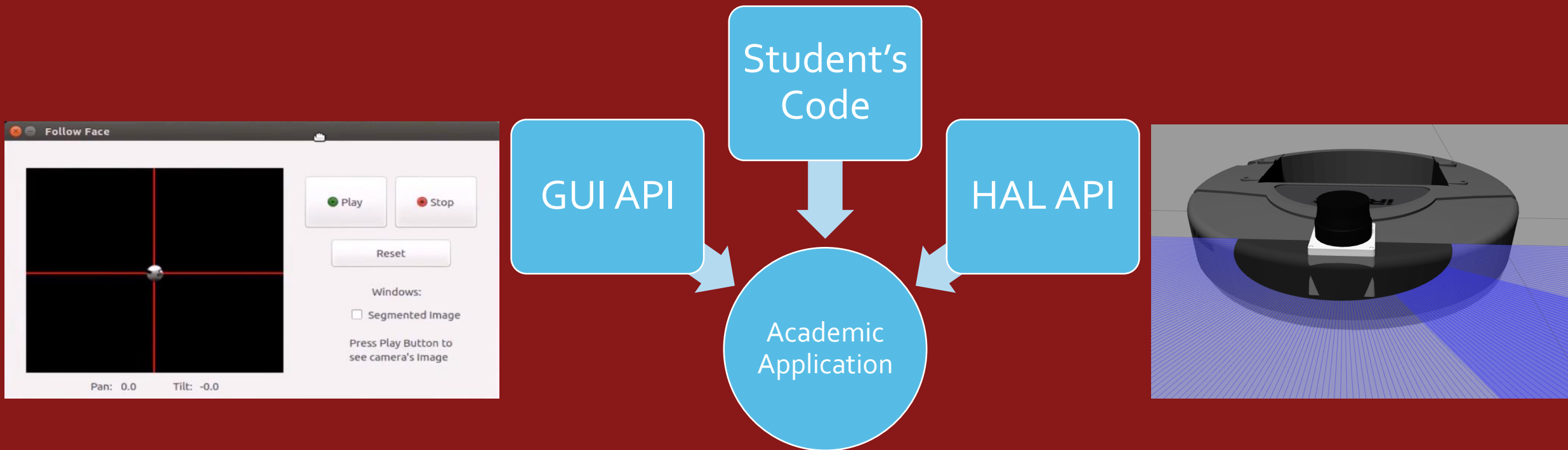
Distribution and Installation

Binary packages have been prepared for Ubuntu and for Debian that already include the drivers, the simulator and the academic applications.

https://github.com/JdeRobot/Academy.git

Practices

| Mobile Robots	Autonomous Cars	Drones	Computer Vision
Follow Line	Global Navigation (GPP)	Position Control	Color Filter
Vacuum Cleaner with SLAM	Car Junction	Follow TurtleBot	3D Reconstruction
Vacuum Cleaner without SLAM	Local Navigation (VFF)	Follow Road	
Bump&Go	Autopark	Cat&Mouse	
Laser Loc		Labyrinth Escape	
Follow Face		Rescue People	
		Visual Lander	

Car Junction

The goal of this practice is to implement the behavior that a car follows when reaching a road junction with a STOP sign. It must stop at the T joint, wait until the road is clear and join another lane.
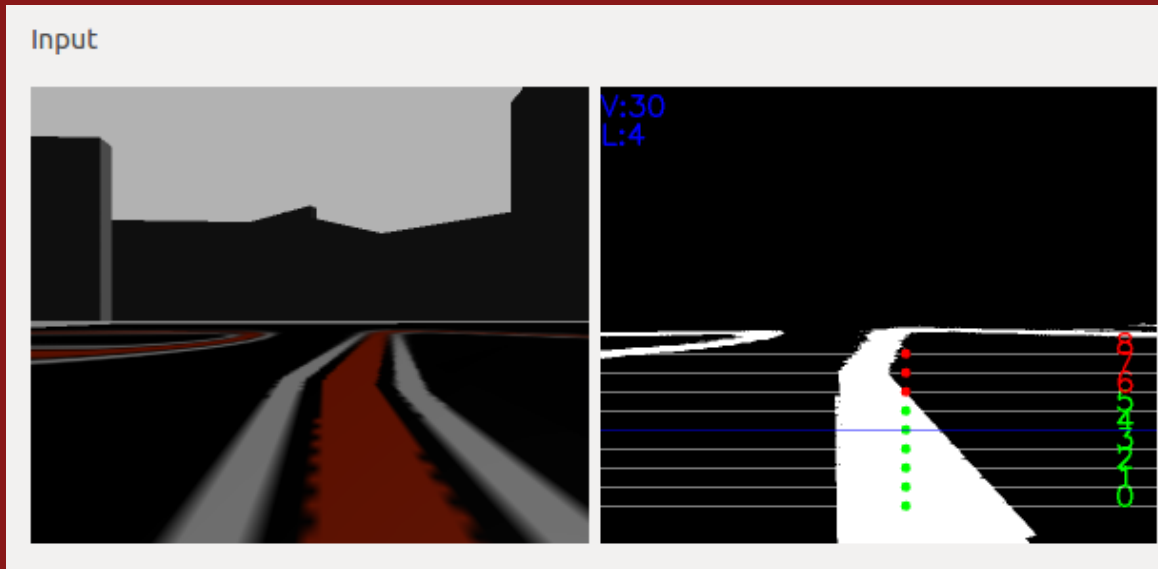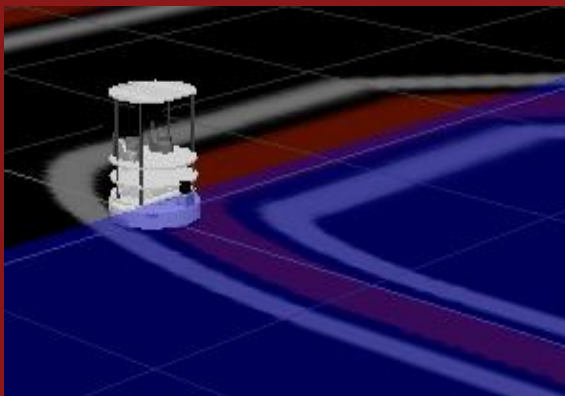

Camera L
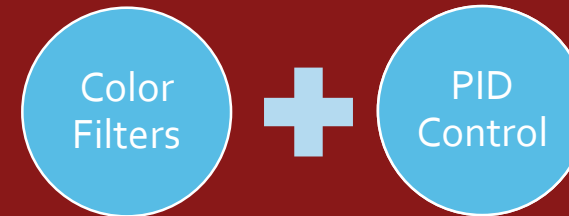
Camera R

Camera C
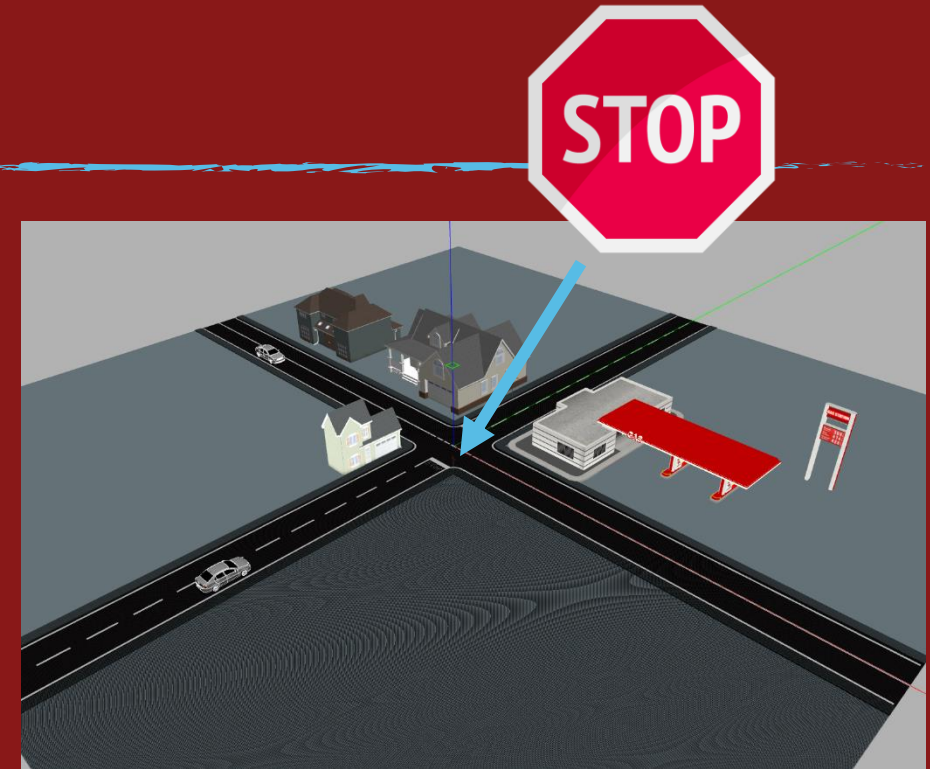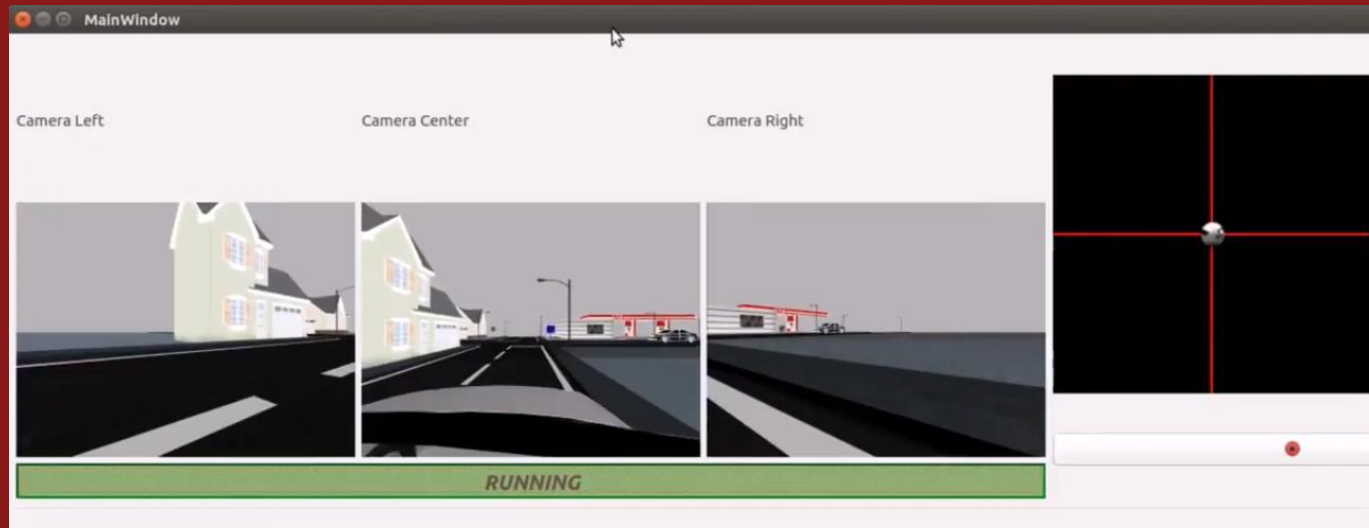
Global Navigation

The objective of this exercise is that a self-driving car can navigate from one point to another of a city which the map is provided.

Follow Line

Input
V:30
L:4
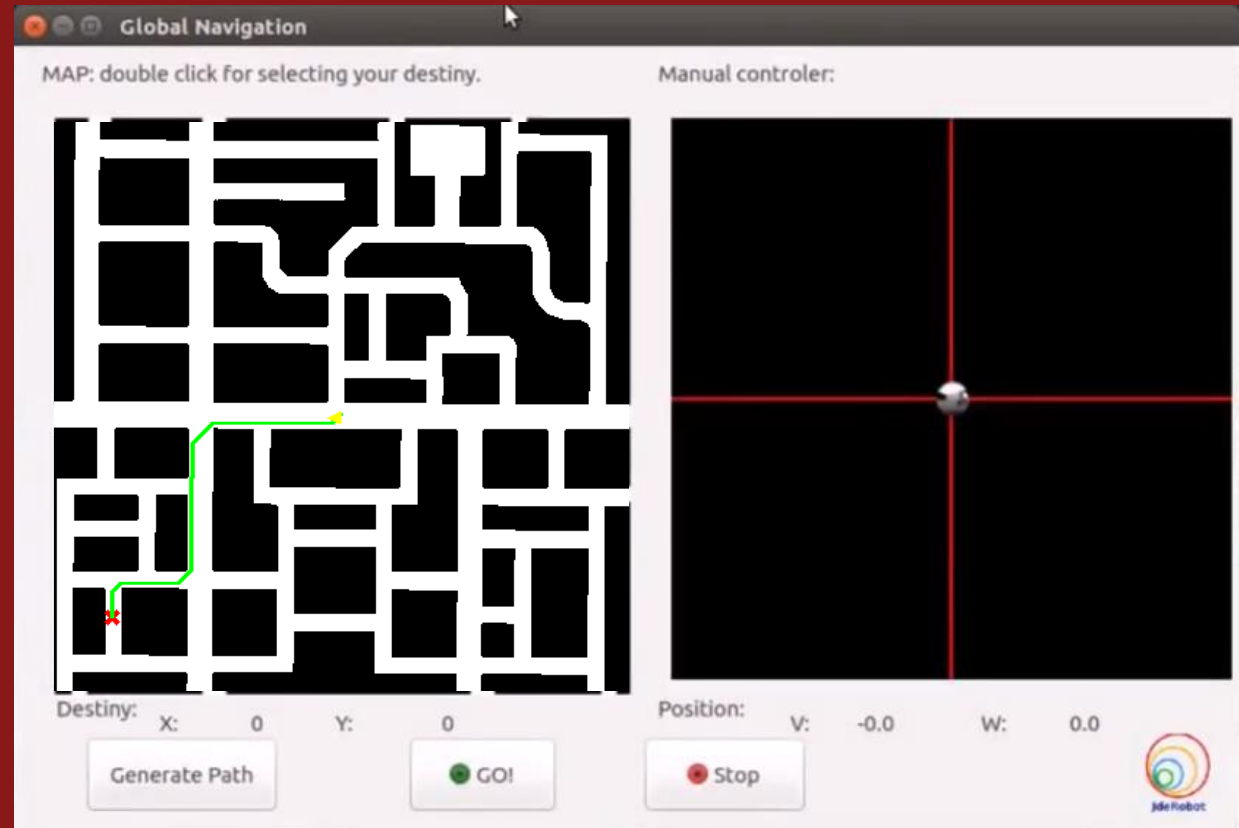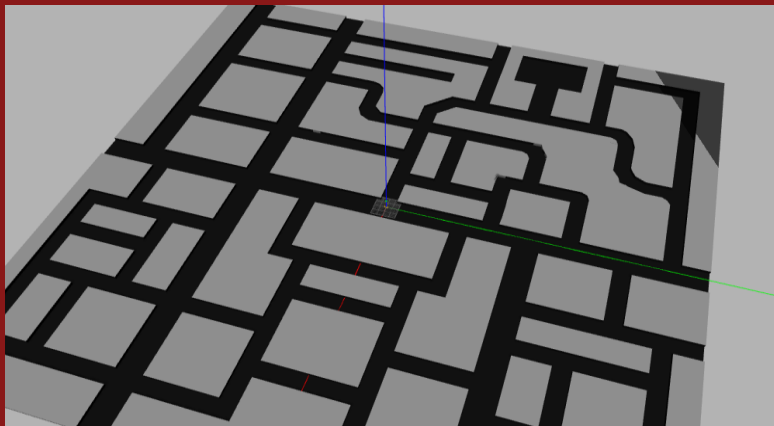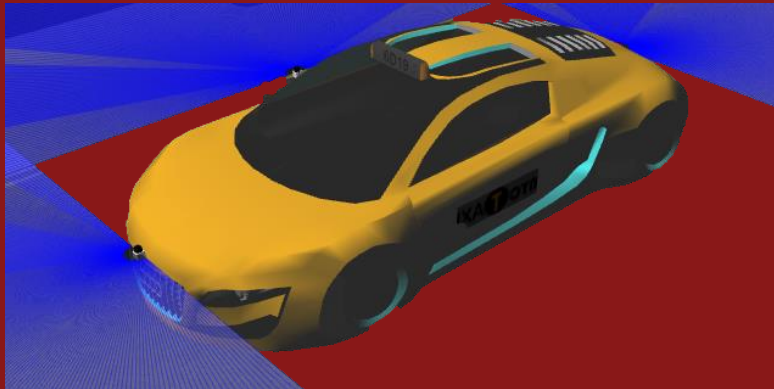
The objective of this exercise is that a mobile Turtle-Bot follow the red line in a circuit in the possible time possible.

Color Filters + PID Control

This practice has both real hardware and simulated versions

Vacuum Cleaner with SLAM

The intention of this exercise is to implement the logic of a navigation algorithm for an autonomous vacuum with autolocation, so that it covers the largest area of known house.
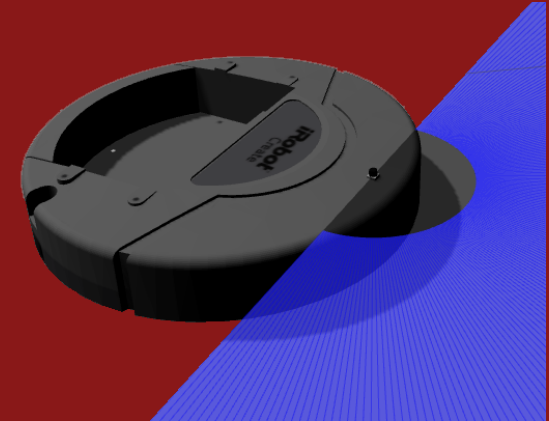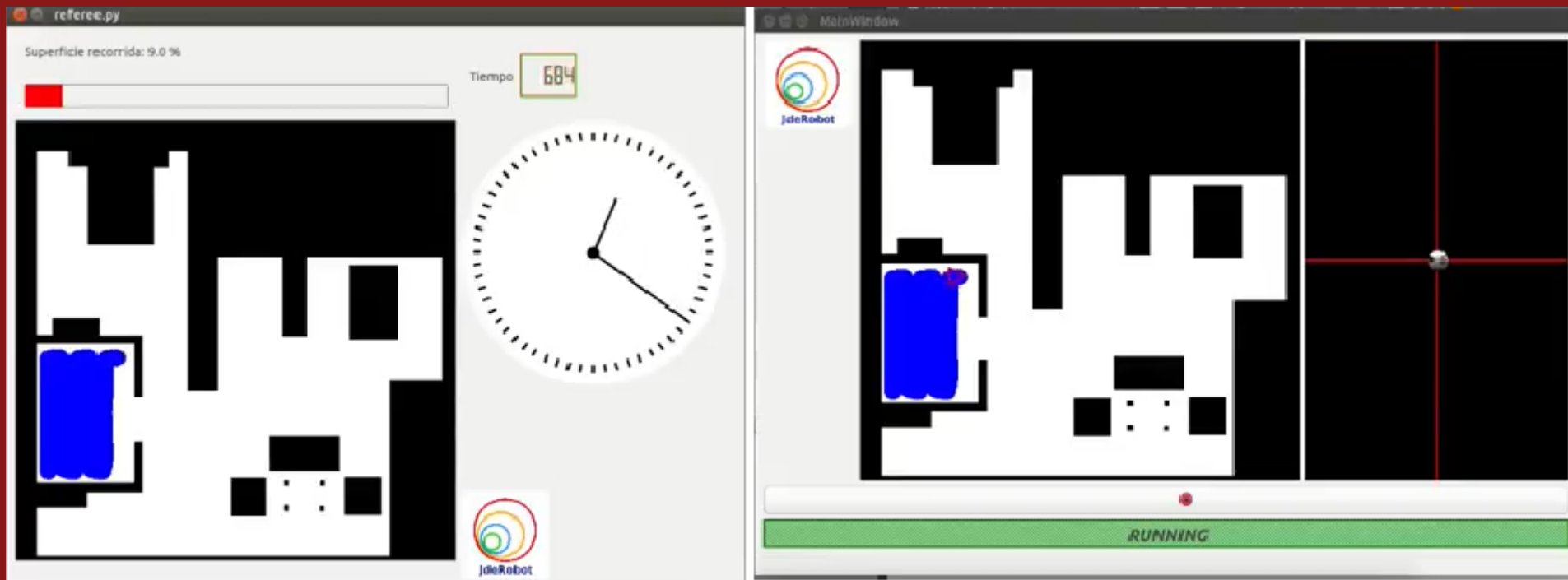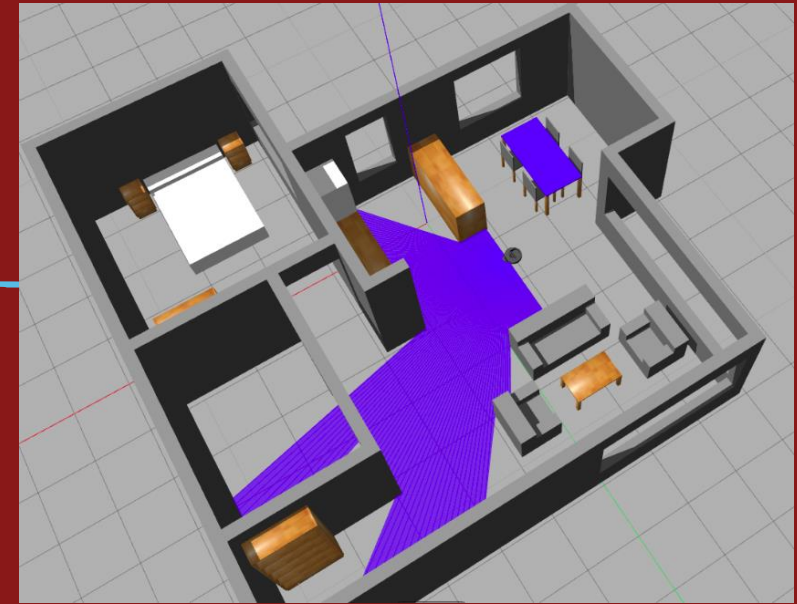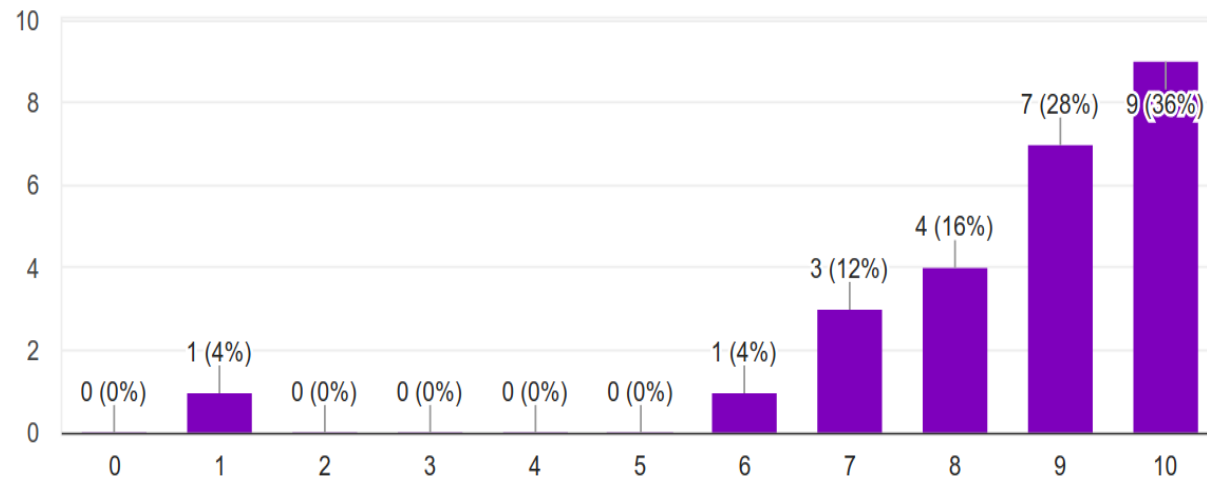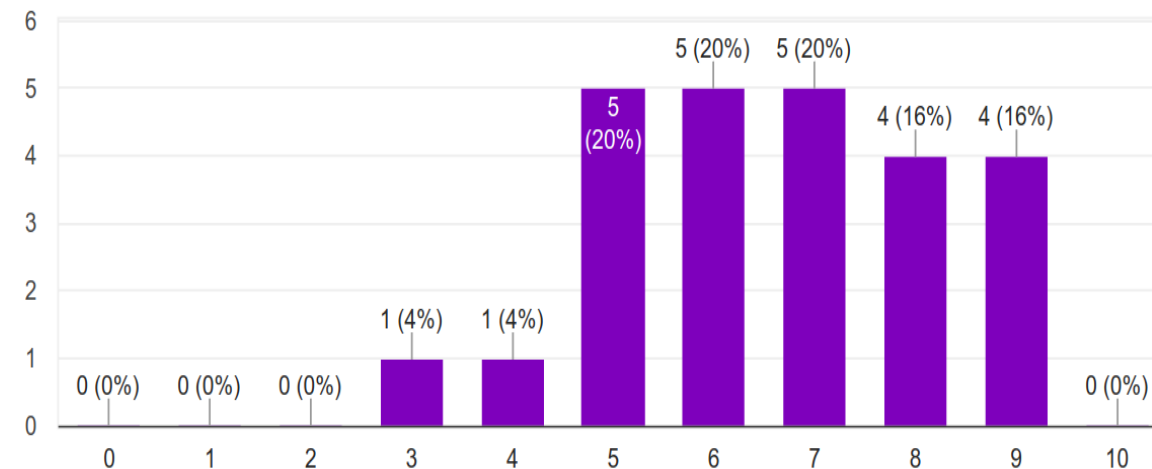
Results of use

Future lines of work

➡️ Web Version of the platform. **Jupyter Notebooks**

➡️ MAVROS in drones' practices

➡️ ROS-Melodic + Gazebo 9