Controlling Mobile Robots by ROS

TECNUN Summer Courses

Robotics, it is called to be one of the greatest technological and social revolutions of the future, or maybe we are already facing this revolution nowadays. Think about drones, self-driving cars, autonomous robotic cleaners, 3d printers, space explorers…
This summer course is intended to provide a global vision how to control Mobile Robots using ROS (Robot Operating System). Robotics is a multidisciplinary field, requiring knowledge about mechanics, electronics and computer science.

This course offers a theoretical point of view of all this concepts, as well as practical. During the course a Mobile Robot Platform will be programmed by using Python, ROS and Raspberry Pi.

Questions

- How can we model a mobile robot?
- How can we control a mobile robot?
- What is ROS and how can we use it?

Content

Syllabus:
•Introduction to robot hardware (sensors, actuators, controllers) and description of the architecture of the mobile robot used
•Introduction to python programming
•Introduction to **R**obot **O**perating **S**ystem (ROS filesystem and middeware)
•mobile robotics modelling
• map generation and motion planning

Practical session: robot programming and competition.

Methodology

Interactive lectures, free-time in the laboratory to program the robot implementing the proposed challenge, under the supervision of the lecturers.

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Objectives

The benefits of attending the course are:
• Obtain a global vision of Robotics .
• To be more conscious about how theory has to be translated into practice during robot programming.
• To practice how to be a part of a multi-disciplinary working team.
• To be excited and motivated by the competition.
•To join TECNUN Micro-robotics Club (CnuRT) (if you want)
• To get the "Diploma" of Robotics from TECNUN

Basic data of the course

Lecturers (TECNUN): Dr. Emilio Sánchez, Carlos Suarez, Nerea Urrestilla
Invited Lecturer (Aalborg Univ.): Dr. Simon Bøgh
Oriented towards: International and Tecnun students
Where: TECNUN Ibaeta Campus, San Sebastián
ECTS: 2 ECTS
Date and time: **June 25th – July 6th**, 2 weeks, 5 h per day.
Language: English/Spanish (depends on the participants).
Number of students: minimum 3, maximum 20
Requisites: Basic programming skills (at least in one of following: C++, python, Matlab, C, C#, java).
Be currently enrolled in any of the following degrees: electrical, computer science or mechanical engineering or related fields.
It would be preferable to have students with more experience (non first year degree students)
To feel motivation and curiosity about robotics

https://www.tecnun.es/short-term-programs