ADVANCED ROBOTICS

Mestrado em Engenharia Eletrónica e de Computadores

Code: 26806

Main Scientific Area: Intelligent Systems and Control

Lecturer: João Luís Araújo Martins Vilaça

Language of Instruction: Portuguese

Regime: S2

Contact Hours: 30h Total Workload: 138h

ECTS: 6,0

Objectives

This course aims to provide students with the fundamental theoretical knowledge of manipulation robotics, complemented with practical experience in programming these robots, either in virtual environment or in real scenario.

Learning Outcomes

It is expected that students who successfully complete this course are able to: • Acquire skills in programming of robot manipulators • Identify the programming structures appropriate to each problem, develop methods of optimization and debugging programs command manipulators.

Course Contents

Robotics technology in industries and medicine areas. Robotic Manipulation: Industrial robots, industrial robots specifications; most common configurations in industrial robots and their applications; robot programming, features of programming languages. Programming of Industrial Robots: Overview of the components of a robot system; Moving the robot; Startup; Executing robot programs; Working with program files: Creating and modifying programmed motions; Using logic functions in the robot program; Loops, conditional instructions and case distinctions; Interrupt handling.

Recommended Bibliography

Peter Corke, Robotics, Vision and Control: Fundamental Algorithms in MATLAB (Springer Tracts in Advanced Robotics), Springer, 2011

Manual de programacao Kuka

Main conferences: ICRA, IROS, RSS, ISER, ISRR Main journals: IJRR, T-RO, Autonomous Robots

Learning and Teaching Methods

The syllabus of this course will enable the student to acquire a set of skills in robotics, specifically in robotics applied to industrial and health sectors. Thus, this course will enable students to know and understand the different types of robots and technologies applied to the development and programming of the same. After this foray theoretical, students will be confronted with a set of real problems in the areas of robotics and autonomous manipulation, and will be encouraged to find solutions to solve them. Through discussion of these will be presented to the student, techniques and methods essential to the motion control of robots, which allow you to achieve your resolution.

Simultaneously, the student will also stimulate demand autonomous solutions to implement strategies more advanced motion control.

Assessment Methods

The final grade of the students is obtained on the basis of the following elements: 1 practical work carried out along the semester in the laboratory - minimum grade 9.5 The student shall be approved in the CU when the grade is greater than or equal to 9.5. Otherwise the student may apply to appeal or special season.