Robótica Móvel e Inteligente

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Lesson 1

1. About the Course:
    - Course Objectives
    - Course Contents
    - Provisional Schedule
    - Evaluation
    - Bibliography
    - Code of Conduct
2. Robotic Agent Architectures
3. Computational Models

Course Objectives

- Provide a comprehensive training in the area of intelligent mobile robotics
- Focus on essential topics for the development of an autonomous mobile robot

Course Contents

- Robotic Agents Architecture
- Perception, Control, Sensor Fusion
- Localization, Navigation and Mapping
- Actuators / Locomotion
- Computer Vision
- Robot Learning
- Introduction to ROS

Evaluation

The course evaluation is based on two components:

- Practical evaluation (60%):
  - Assignment 1 (includes oral presentation) – 25%
  - Assignment 2 (includes oral presentation) – 35%
- Theoretical evaluation (40%):
  - Final exam

Provisional Schedule

Lesson	Date	T	Prof.	P
1	15-Sep-2023	Course Presentation Robotic Agent Architectures + Computational Models	NL	Assignment 1 Specification
2	22-Sep-2023	Control	PF	Assignment 1
3	29-Sep-2023	Sensors	PF	Assignment 1
4	6-Oct-2023	Sensor Fusion	NL	Assignment 1
5	13-Oct-2023	Localization/Navigation/Mapping	ACP	Assignment 1
6	20-Oct-2023			Assignment 1
7	27-Oct-2023	Assignment 1 Delivery/Presentation/Demo		
8	3-Nov-2023	Actuators	MBC	Assignment 2 Specification
9	10-Nov-2023	Locomotion	JLA	Assignment 2
10	17-Nov-2023	Computer vision	MBC	Assignment 2
11	24-Nov-2023	Machine Learning in Robotics	NL	Assignment 2
12	15-Dec-2023	Introduction to ROS	NL	Assignment 2
13	22-Dec-2023	Assignment 2 Delivery/Presentation/Demo		

Bibliography

- Probabilistic Robotics, Sebastian Thrun, Wolfram Burgard and Dieter Fox, MIT Press, 2005.
- Introduction to Autonomous Mobile Robots, Roland Siegwart, Illah Reza Nourbakhsh, Davide Scaramuzza, MIT Press, 2nd edition, 2011.
- Principles of Robot Motion, Howie Choset et al., MIT Press, 2005
- Autonomous Robots - From Biological Inspiration to Implementation and Control, George A. Bekey, MIT Press, 2005.
- Springer Handbook of Robotics, Bruno Siciliano, Oussama Khatib, Springer, 2017
- Robotics, Vision and Control: Fundamental Algorithms In MATLAB, Peter Corke, Springer, 2017
- A Gentle Introduction to ROS, Jason M. O'Kane, CreateSpace, 2013
- Machine vision: Theory, algorithms, practicalities, E. R. Davies, Morgan Kaufmann 2005.
- Computational Principles of Mobile Robotics, Gregory Dudek, Michael Jenkin, Cambridge University Press, 2nd edition, 2010

Code of conduct

- Students should participate in every class. Unattended classes will be considered for final evaluation.
- **Plagiarism** is the act of signing or presenting intellectual work of any nature (text, music, painting, photo, audio, video, etc) containing parts of work that belongs to another person without providing credits to the original author.
- Any initiative that, judged by the teaching team, might be considered as a plagiarism situation will have real consequences on the student(s) evaluation and may lead to disciplinary sanctions.