Middlesex University Dubai

PDE4430

Mobile Robotics

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Syllabus

- Basics of **robot programming** (e.g. Python)
- **Coordinate systems** and **transformations** for mobile robotics
- **Robot locomotion** and **navigation**, obstacle avoidance
- Localisation and mapping (**SLAM**)
- Mobile robot **sensors** and control
- Use of **simulation systems** for mobile robotics
- **Programming** in an appropriate language for mobile robot control, such as Python and **ROS**

Learning Outcomes

- Explain **robot kinematics** and reference **frame transformations** in the context of mobile robotics.
- Examine and discuss **fundamental concepts in mobile robotics**
- Analyse and understand **code for programming robot systems** using a range of software tools, including simulations.
- **Program a mobile robot** to carry out a task using an appropriate programming language.

Resources

- **Essential:**
  - Lecture notes + supplementary material provided in class

- **Recommended:**
  - A Gentle Introduction to ROS (free)
  - Online resources about ROS: **wiki.ros.org**
  - ROS by Example – Goebel, P (2013)
  - Software Engineering for Experimental Robotics – Brugali, D (2007)

Assessment

- **Coursework:**
  - Assessed coursework: 30%
  - Final project: 70%

- **Consultation Hours:**
  - Monday: 5:30pm – 6:30pm

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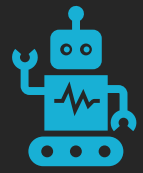

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