Engineering Tripos Part IIB, 4I15: Mobile Robot Systems, 2020-21

Leader
Dr A Prorok

Lecturer
Dr A Prorok

Lecturer
Dr F Iida

Lecturer
Dr F Forni

Timing and Structure
Lent term. Lectures and coursework. Assessment: 100% coursework.

Prerequisites
4M20 useful; 3F2 useful; 3F3 useful

Aims
The aims of the course are to:

- This course teaches the foundations of autonomous mobile robots, covering topics such as perception, motion control, and planning.
- It also teaches algorithmic strategies that enable the coordination of multi-robot systems and robot swarms.
- The course will feature several practical sessions with hands-on robot programming. The students will undertake mini-projects, which will be formally evaluated through a report and presentation.

Objectives
As specific objectives, by the end of the course students should be able to:

- understand how to control a mobile robot;
- understand how a robot perceives its environment;
- understand how a robot plans actions (navigation paths);
- know paradigms of coordination in systems of multiple robots;
- know classical multi-robot problems and their solution methods;

Content
Further notes

Requirements:

Students are expected to have laptops running Linux, with installations of ROS Kinetic and Gazebo. An installation guide will be provided.

Coursework

Students will be expected to hand in two reports and attend an individual questioning session.

<table>
<thead>
<tr>
<th>Coursework activity #1 : Assignments</th>
<th>Format</th>
<th>Due date &amp; marks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Individual Report</td>
<td></td>
<td>February 2021</td>
</tr>
<tr>
<td>anonymously marked</td>
<td></td>
<td>60% (30% each) assignment</td>
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| Coursework activity #2 : | |
|----------------------------|--------|------------------|
| Individual Report          |        | April 2021       |
| anonymously marked         |        | 40%              |

Format and Due date & marks for each coursework activity.
Booklists


Examination Guidelines

Please refer to [Form & conduct of the examinations](http://teaching.eng.cam.ac.uk/content/form-conduct-examinations) [4].

Last modified: 07/10/2020 08:53

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Links

[1] mailto:asp45@cam.ac.uk
[2] mailto:fi224@cam.ac.uk
[3] mailto:ff286@cam.ac.uk