60822 - Computer Vision and Robotics

Syllabus Information

Academic Year:	2018/19
Subject:	60822 - Computer Vision and Robotics
Faculty / School:	110 -
Degree:	532 - Master's in Industrial Engineering
ECTS:	6.0
Year:	2
Semester:	First semester
Subject Type:	Optional
Module:	---

General information

Aims of the course

Context and importance of this course in the degree

Recommendations to take this course

Learning goals

Competences

Learning goals

Importance of learning goals

Assessment (1st and 2nd call)

Assessment tasks (description of tasks, marking system and assessment criteria)

Methodology, learning tasks, syllabus and resources

Methodological overview

The methodology followed in this course is oriented towards achievement of the learning objectives. A wide range of teaching and learning tasks are implemented, such as lectures, practice sessions, projects, laboratory sessions, and autonomous work and study.

Learning tasks

The course includes the following learning tasks:

- **Lectures**. The theoretical components of the course will be explained, discussed and illustrated with examples.
- **Practice sessions**. During these sessions there will be problems and examples proposed, discussed and solved.
- **Laboratory sessions**. Different lab sessions are carried out in small groups and supervised by teachers.
- **Project**. Practical project supervised by the professor to apply the different learned topics. In the project, students will apply their knowledge and skills as training and as self-evaluation.
- **Autonomous work and study**. Study of the theoretical contents, to make self-evaluation exercises and prepare the laboratory sessions.

Syllabus

The course will address the following topics:

1. Image acquisition.
2. Basic Image processing.
3. Feature, detection and matching.
4. Contour and region segmentation.
5. Visual Recognition.
6. 3D Vision.
7. Image alignment.
8. Structure from motion.
9. Perception for Robotics.
10. Applications: visual inspection and 3D vision for robotics.

Laboratory sessions

1. Image processing.
2. Feature detection and matching.
3. Image segmentation and Recognition.
4. Camera calibration.
5. Two-view geometry.
6. 3D reconstruction.
7. Visual servoing.

Course planning and calendar

Further information concerning the timetable, classroom, office hours (http://diis.unizar.es/ConsultaTutorias.php), assessment dates and other details regarding this course, will be provided on the first day of class or please refer to the EINA website and (http://add.unizar.es).

Bibliography and recommended resources