69317 - Computer vision perception

Información del Plan Docente

Academic Year	2016/17
Academic center	110 - Escuela de Ingeniería y Arquitectura
Degree	547 - Master's in Biomedical Engineering
ECTS	3.0
Course	1
Period	Second semester
Subject Type	Optional
Module	---

1.Basic info

1.1.Recommendations to take this course

1.2.Activities and key dates for the course

2.Initiation

2.1.Learning outcomes that define the subject

2.2.Introduction

3.Context and competences

3.1.Goals

3.2.Context and meaning of the subject in the degree

3.3.Competences

3.4.Importance of learning outcomes

4.Evaluation

5.Activities and resources

5.1.General methodological presentation

The teaching methodology is structured in three levels: theoretical classes where the main subject contents are presented and discussed, student participation is encouraged; also computer lab sessions and development of practical tasks based on a real application or specific research activity are propose

5.2.Learning activities

There will be the following activities:
A01 Theoretical classes with the active involvement of the student (18 hours) . The main course contents

are presented.

A03 Computer lab sessions (24 hours) . Different lab sessions are carried out. Notes for each lab session where the different activities are planned will be available before the session,. In the following days after the lab session, the student should fihish lab session. Each student selectcs one of the practical exercises for a more detailed study. The student has to write a 5 pages report of the selected excise including as sections: Introduction, theoretical basis, experiments, disucussion, conclusions, and bibliography.

A05 Reading reserach publications (10 hours) . Each student selects a research publication from a list of popular and influential articles in computer vision. Then the stdent has to make 10 minutes talk to orally present the selected article.

A06 Tutorials (3 hours) . Students may solve any questions they might have about unclear contents of the course.

A08 Assessment (2 hours) . The student will take an exam and several reports derived from the computer lab sessions and derived from the development of practical tasks will be evaluated.

Individual study (18 hours) , devoted to study theoretical contents and to make self evaluation exercises.

5.3.Program

Lecturing

1.- Image adquistion.

2.- Feature detection and matching.

3.- Feature based image alignment.

4.- Structure from motion.

5.- Computer vision and Augmented Reality.

6.- Visual recognition.

Lab sessions:

1.- Bundle adjustment.

2.- Uncalibrated geometry and robust matching.

3.- Visual classification.

4.- Structure from motion and Augmented Reality.

5.4.Planning and scheduling

The course schedule is defined by the official "Escuela de Ingeniería y Arquitectura" calendar.

5.5.Bibliography and recomended resources

BB OpenCV essentials : acquire, process, and analyze visual content to build full-fledged imaging applications using OpenCV / Oscar Deniz Suarez ... [et al.] . - 1st ed. Birmingham : Packt, 2014

BB Szeliski, Richard. Computer vision : algorithms and applications / Richard Szeliski London : Springer, cop. 2011

BC Forsyth, David A.. Computer vision : a modern approach / David A. Forsyth, Jean Ponce . - 2nd ed. Upper Saddle River : Prentice Hall, 2012

BC Hartley, Richard. Multiple view geometry in computer vision / Richard Hartley, Andrew Zisserman . - 2nd ed. Cambridge : Cambridge University Press, 2003