

Academic Year: (2021 / 2022)

Review date: 17-05-2021

Department assigned to the subject: Systems Engineering and Automation Department

Coordinating teacher: ARMINGOL MORENO, JOSE MARIA

Type: Compulsory ECTS Credits : 6.0

Year : 1 Semester : 1

OBJECTIVES

With this subject it is tried that the student acquires basic knowledge that allow him to analyze and to design computer vision systems.

DESCRIPTION OF CONTENTS: PROGRAMME

1. Introduction
 - Applications
 - Elements
2. Bottom-up design
 - Image preprocessing
 - Edge detection
 - Region segmentation
 - Object description
3. To-down design
 - Rigid models
 - Deformable models
 - Optimization
4. Stereo Vision
 - Perspective projection
 - Camera calibration
 - Image rectification

LEARNING ACTIVITIES AND METHODOLOGY

Skillful classes, individual presentations of the students, individual tutorials and personal work of the student; oriented to the theoretical knowledge acquisition.

ASSESSMENT SYSTEM

Continuous evaluation based on works, participation in class and tests of evaluation of abilities and knowledge.

% end-of-term-examination:	40
% of continuous assessment (assignments, laboratory, practicals...):	60

BASIC BIBLIOGRAPHY

- Duda, R. O., Hart, P. E., and Stork, D. G. Pattern Classification, John Wiley & Sons, 2000
- Gonzalez, R. C. and Woods, R. E. Digital Image Processing, Prentice Hall, 2007
- Jain, R., Rangachar, K., and Sunk, Computer Vision, McGraw-Hill.
- Pratt, W. K Digital Image Processing, Wiley Interscience.
- Russ, J. C. The Image Processing, Handbook CRC.
- Shapiro, L. G. and Stockman Computer Vision, Prentice-Hall.

ADDITIONAL BIBLIOGRAPHY

- Baggio, Daniel Lélis Mastering OpenCV with Practical Computer Vision Projects, Packt Publishing, 2012
- Davies, E. R. Computer and machine vision: theory, algorithms, practicalities, Elsevier, 2012

- Gary Bradski, Adrian Kaehler Learning OpenCV: Computer Vision with the OpenCV Library, O'Reilly Media, 2008
- Margarita N. Favorskaya, Lakhmi C. Jain Computer Vision in Control Systems-2, Springer, 2015
- Nixon, Mark S. Feature extraction & image processing for computer vision, Academic Press, 2012

BASIC ELECTRONIC RESOURCES

- Carnegie Mellon University . The Computer Vision Homepage: www.cs.cmu.edu/~cil/vision.html
- Richard Szeliski . Computer Vision: Algorithms and Applications: <http://szeliski.org/Book/>
- Stanford . Stanford Computer Vision Lab: <http://vision.stanford.edu/>