Course guides
32095 - AIPM - Advanced Image Processing in Matlab

Unit in charge: Barcelona School of Telecommunications Engineering
Teaching unit: 731 - OO - Department of Optics and Optometry.

Academic year: 2015 ECTS Credits: 2.5 Languages: English

LEADERE

Coordinating lecturer: Artur Carnicer
Others:

TEACHING METHODOLOGY
Presencial Teaching + activities

LEARNING OBJECTIVES OF THE SUBJECT
This subject overviews several advanced topics on digital image processing. The course provides an in-depth treatment of advanced image processing techniques, emphasizing software principles and practical implementation. This is a hands-on course and a basic knowledge of the MATLAB/Octave computing environment is required.

CONTENTS

Fundamentals of Digital Image Processing
Images as matrices. Brief review of matrix- and array-based operations in MATLAB
Basic Image operations in MATLAB: Intensity transformations and Spatial Filtering
Color Image Processing. Color Spaces: RGB, YCbCr, HSV, CMY
2D Fast Fourier Transform in MATLAB
Image compression: the JPEG Compression algorithm
Morphological Image Processing: dilation and erosion. Morphological operations

Image segmentation: point, line and edge detection. Line detection and the Hough transform. Thresholding methods. Region-based segmentation

Watermarking and encryption

GPU programming

GRADING SYSTEM

Students have to implement one of the algorithms analyzed in the course, providing examples of how it is used in practice. A written report of his/her work is required.

EXAMINATION RULES.

The usual in University teaching

BIBLIOGRAPHY

Basic: