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.
Content

Fundamentals of Digital Image Processing

Degree competences to which the content contributes:

Images as matrices. Brief review of matrix- and array-based operations in MATLAB

Degree competences to which the content contributes:

Basic Image operations in MATLAB: Intensity transformations and Spatial Filtering

Degree competences to which the content contributes:

Color Image Processing. Color Spaces: RGB, YCbCr, HSV, CMY

Degree competences to which the content contributes:

2D Fast Fourier Transform in MATLAB

Degree competences to which the content contributes:

Image compression: the JPEG Compression algorithm

Degree competences to which the content contributes:

Morphological Image Processing: dilation and erosion. Morphological operations

Degree competences to which the content contributes:

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

Degree competences to which the content contributes:

Watermarking and encryption

Degree competences to which the content contributes:
32095 - AIPM - Advanced Image Processing in Matlab

**GPU programming**

**Degree competences to which the content contributes:**

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**Qualification 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.

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**Regulations for carrying out activities**

The usual in University teaching

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**Bibliography**

**Basic:**

