

EEU44C08 Digital Image and Video Processing [5 credits]

Lecturer(s): Ussher Assistant Professor François Pitié

Module organisation

Semester	Start Week	End Week	Associated Practical Hours	Lectures		Tutorials	
				Per Week	Total	Per Week	Total
2	1	12	20	3	30	0	5
Total contact Hours: 55							

Module description

The Digital Image and Video Processing module develops the concepts learned in Signal Processing and Information Theory and applies them to images and video. Image and Video Processing is the basis of all digital media technology and is an active area of research over a wide range of applications such as Compression and Medical Image Analysis. The course features an introduction to digital image/video processing algorithms that form the core of digital media technology. There is a particular emphasis placed on the issues pertaining to the coding (compression) of both images and videos. At the end of this module students should have a basic knowledge of JPEG, MPEGx, Motion Estimation and other well-established image/video processing applications. The students should also be able to implement and test the algorithms in software.

Learning outcomes

On completion of this module, the student will be able to:

1. describe the elements of current media formats;
2. describe the building blocks of compression systems and select processing modules to enable efficient compression;
3. use Matlab to perform fundamental image processing applications such as image filtering;
4. use Matlab to perform video processing applications such motion estimation;

Teaching strategies

The teaching strategy for this module is a mixture of lectures, problem-solving laboratories and interactive class demonstrations. There are 5 assignments to be undertaken throughout the course that complement the material covered in the lectures and are designed to deepen understanding of the course material. The assignments are MATLAB based.

All lecture material can be accessed online and lectures are recorded and posted on YouTube.

Assessment

The final written end-of-year examination counts for 75% of overall mark with the remaining 25% comprised of continuous assessment made from laboratory work and one design problem.

Supplemental assessment is by individual examination.

Textbooks

- Digital Image Processing. Gonzalez and Woods. Prentice Hall (a good general purpose image processing text book)
- JPEG: Still Image Processing Standard. Pennebaker and Mitchell. Van Nostrand Reinhold. (a reference for JPEG)
- Digital Video: An Introduction to MPEG2. Haskell, Puri and Netravali. Chapman and Hall (a reference for MPEG2)
- Two Dimensional Image Processing, J Lim, Prentice Hall (for 2D signal processing)