Liverpool John Moores University

Title:	DIGITAL IMAGE PROCESSING
Status:	Definitive
Code:	**6029ENG** (106369)
Version Start Date:	01-08-2016

Owning School/Faculty:	Electronics and Electrical Engineering
Teaching School/Faculty:	Electronics and Electrical Engineering

Team	Leader
Rebecca Bartlett	Y

Academic Level:	FHEQ6	**Credit Value:**	12	**Total Delivered Hours:**	50
Total Learning Hours:	120	**Private Study:**	70		

Delivery Options

Course typically offered: Summer

Component	Contact Hours
Lecture	24
Practical	12
Tutorial	12

Grading Basis: 40 %

Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Exam	AS1	Examination	50	2
Report	AS2	Image analysis exercise	50	

Aims

To introduce the student to the basic principles of digital image processing for the enhancement of images and for the extraction of meaningful information from them with applications in engineering.

Learning Outcomes

After completing the module the student should be able to:

1. Analyse digital images and their uses
2. Apply the theory and implementation of a range of basic image processing operations
3. Determine the applications, advantages and disadvantages of a range of basic image processing functions.
4. Analyse the advantages and disadvantages of image compression techniques
5. Specify the most appropriate image processing techniques for a particular application

Learning Outcomes of Assessments

The assessment item list is assessed via the learning outcomes listed:

EXAM   1   2   3   4   5

Image analysis exercise   1   2   3   5

Outline Syllabus

Background: digital image representation, sampling and quantization, image storage
Optical basis of image formation: imaging geometry, stereo-vision, the human visual system.
The basic principles and applications of:
Point processing and histogram manipulation,
Spatial filtering: smoothing, high-pass filtering, first and second derivative filters.
Frequency domain operations: Fourier transform, ideal low and high pass filters, Butterworth filter,
Morphology, segmentation and object labeling.
Introduction to colour images.
Image compression: Lossy and non-lossy compression.
Applications of digital image processing.

Learning Activities

Lectures, tutorials and computer laboratory sessions.

Notes

This module will provide students with a sound grasp of the basic theory and applications of modern digital image processing.