Overview

ELEC6213 Image Processing

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- There are 22 lectures, 12 practical labs and 2 tutorials in this module.
- The assessment is 70% written exam and %30 lab.

- The Lecture materials can be downloaded from the web with the following link:
  https://secure.ecs.soton.ac.uk/notes/elec6213/

- The main references are as follows:
Processing Scheme

1. Acquire image
2. Low-level processing
3. High-level processing
Images consist of picture elements known as "pixels"
2D Images are therefore matrices of numbers
Point Operations

Recalculate point values

Modify brightness

Find Intensity
Group Operations

Process neighborhoods

Image Filtering  Edge Detection
Feature Extraction

Finds shapes

Roads in remotely-sensed image

Artery in ultrasound image
Overview

- The list of subjects we discuss in this module is as follows:

1. Image acquisition and Sampling theory
2. Image Transformations: Fourier, Discrete Cosine, Hartley and Wavelet
3. Histogram Processing and Image Filtering
4. Shape Descriptors
5. Edge Detection: Prewitt, Sobel, Canny, scale invariant filters
6. Segmentation using Active Contours based on Level set Formulation
7. Shape Registration: Contours, SDFs
8. Noise Reduction in Images: Anisotropic Diffusion, Wiener Filter, and Total Variation Method