The University Of Sheffield.

Electronic & Electrical Engineering.

EEE6086 VIDEO PROCESSING AND ANALYSIS

Credits: 10

Course Description including Aims

This unit introduces basics of video processing functions and their applications in a modern video chain. It provides the students an overview of various video processing algorithms for picture quality assessment and improvement. Concepts of sharpness, colour and contrast enhancement, noise reduction, scaling, motion estimation and picture rate conversion will be explored and demonstrated. Topics of video analysis including feature extraction, object detection and supervised learning will also be outlined. The students will get a realistic notion of the acceptable complexity of these algorithms and learn about the characteristics of the human visual system. The coursework component of this unit aims to provide an understanding of using software tools, such as MATLAB, in solving problems and implementing simple video processing algorithms.

This unit aims to:

1. provide an understanding of video processing functions in a modern video chain;
2. introduce the concept of filter design in the application of video processing;
3. present an overview of various video processing algorithms for picture quality assessment and improvement;
4. introduce basic video analysis techniques;
5. offer hands-on experience in video processing.

Outline Syllabus

Basic filters, image enhancement, picture rate conversion, de-interlacing, motion estimation, texture sysnthesis

Time Allocation

18 lectures, 4 seminars and 2 programming sessions.

Recommended Previous Knowledge

UG level 3 (or equivalent) understanding of basic signal processing, computing and/or applied mathematics.

Assessment

1.5 hour examination.
Coursework.

Recommended Books

Digital Video Post Processing, Gerard de Haan