COMP3204/COMP6223 - Computer Vision Revision Lecture

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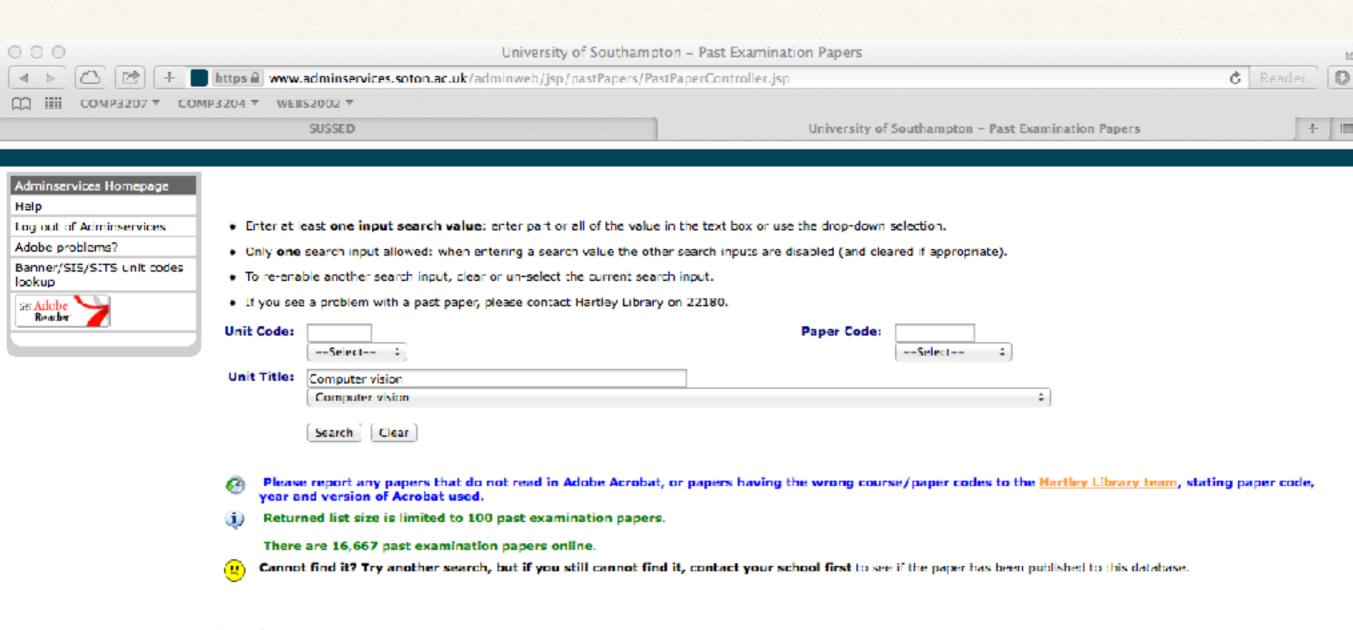
Thursday 19th January 0930-1130

Exam Format

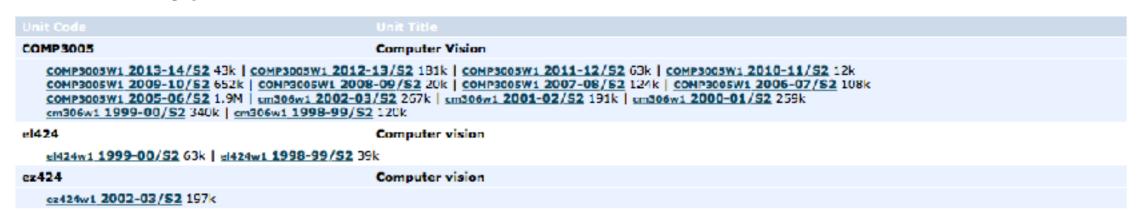
- * 2 hours duration
- Choose 3 questions from 6
 - * Each question worth 33 marks
 - * Mark wrote 3; I wrote 3
 - * Expect that Mark's will *typically* cover lower level vision & mine will cover higher level vision
 - * but, there will probably be some overlap!

Typical mark scheme

- * 80% from lectures and notes; 20% from independent reading
 - * Most questions will be broken down into sub-parts
 - * Mark has a tendency to write a single question with 33 marks!
 - * I might have adopted this approach for one question to make you less likely to leave me with all the marking;)
 - * The marks for each question are there to help you
 - Use them to judge how much to write and how much time to spend



Search Results - 17 papers





4.

Feature morphology and segmentation

- (a) **Describe** with the aid of sketches three different morphologies of image feature. [6 marks]
- (b) **Describe** two strategies for segmenting an image. [13 marks]
- (c) **Compare** the two strategies from the previous answer, highlighting advantages and disadvantages of one with respect to the other. [8 marks]
- (d) **Identify** parameters that will need to be set, either manually or automatically for the segmentation methods you described and strategies to choose them. [6 marks]

Eigenfaces and PCA: Eigenfaces uses principle component analysis to reduce the dimensionality of a feature based on the raw grey-level pixel values in a face image. Face recognition is achieved by training a classifier on these low-dimensional features.

- (a) **Describe** what Eigenvalues and Eigenvectors are, and in terms of the distribution of a set of data points describe what they represent.

 [7 marks]
- (b) For a 2x2 covariance matrix, demonstrate with the help of diagrams the effect of different values within the covariance matrix on the principal axes. [6 marks]
- (c) **Provide** a description of the steps to achieving dimensionality reduction using PCA. [10 marks]
- (d) **Describe** two classification approaches that could be used with the reduced dimension features to build a facerecognition system. What are the advantages and disadvantages of the two techniques? [10 marks]

Visual Words

- (a) **Describe** in detail an approach to learning a set of "Visual Words" from a local feature like SIFT. [11 marks]
- (b) **Describe** what is meant by vector-quantisation. [3 marks]
- (c) **Describe** how you might use a Bag-of-Visual-Words to create a system for searching large numbers of images. Relate your answer to the techniques used in text indexing and search. [11 marks]
- (d) One key parameter of a Bag-of-Visual-Words representation is the size of the vocabulary. Provide details of the trade-offs in vocabulary size for the tasks of (a) image search and (b) image classification. [8 marks]

Questions