COMP3204/COMP6223 - Computer Vision Revision Lecture

Jonathon Hare

jsh2@ecs.soton.ac.uk
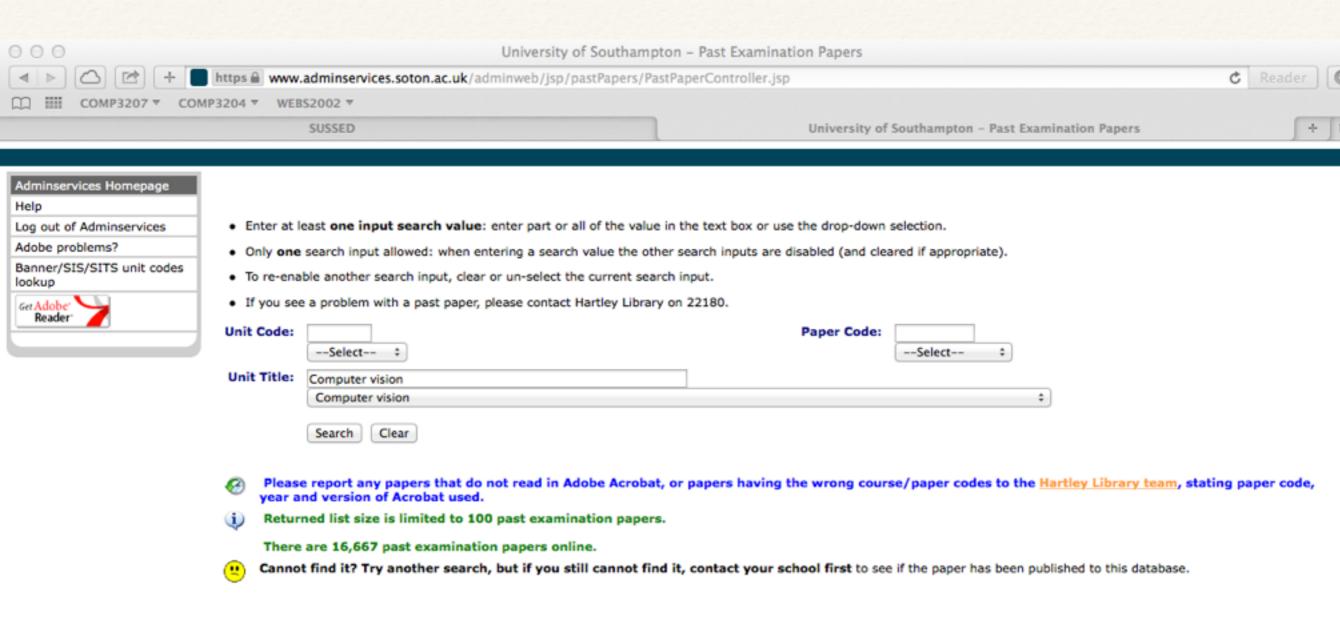
Wednesday 21st January
1430-1630

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!

  - The marks for each question are **there to help you**

    - Use them to judge how much to write and how much time to spend

https 🔒 www.adminservices.soton.ac.uk/adminweb/jsp/pastPapers/PastPaperController.jsp

COMP3207 ▾   COMP3204 ▾   WEBS2002 ▾

SUSSED

University of Southampton – Past Examination Papers

Adminservices Homepage

Help

Log out of Adminservices

Adobe problems?

Banner/SIS/SITS unit codes lookup

Get Adobe® Reader®

- Enter at least **one input search value**: enter part or all of the value in the text box or use the drop-down selection.

- Only **one** search input allowed: when entering a search value the other search inputs are disabled (and cleared if appropriate).

- To re-enable another search input, clear or un-select the current search input.

- If you see a problem with a past paper, please contact Hartley Library on 22180.

Unit Code: [   ]   **Paper Code:** [   ]

[--Select-- ⬍]   [--Select-- ⬍]

Unit Title: [Computer vision   ]

[Computer vision   ⬍]

[Search] [Clear]

🌐 Please report any papers that do not read in Adobe Acrobat, or papers having the wrong course/paper codes to the Hartley Library team, stating paper code, year and version of Acrobat used.

ⓘ Returned list size is limited to 100 past examination papers.

There are 16,667 past examination papers online.

🙁 **Cannot find it? Try another search, but if you still cannot find it, contact your school first** to see if the paper has been published to this database.

Search Results - 17 papers

Unit Code	Unit Title
COMP3005	**Computer Vision**
COMP3005W1 **2013-14/S2** 43k	COMP3005W1 **2012-13/S2** 181k	COMP3005W1 **2011-12/S2** 63k	COMP3005W1 **2010-11/S2** 12k COMP3005W1 **2009-10/S2** 652k	COMP3005W1 **2008-09/S2** 20k	COMP3005W1 **2007-08/S2** 124k	COMP3005W1 **2006-07/S2** 108k COMP3005W1 **2005-06/S2** 1.9M	cm306w1 **2002-03/S2** 267k	cm306w1 **2001-02/S2** 191k	cm306w1 **2000-01/S2** 259k cm306w1 **1999-00/S2** 340k	cm306w1 **1998-99/S2** 120k	
el424	**Computer vision**
el424w1 **1999-00/S2** 63k	el424w1 **1998-99/S2** 39k	
ez424	**Computer vision**
ez424w1 **2002-03/S2** 197k	

✉ Please send us your questions/comments; digitise@soton.ac.uk

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]

5.

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 face-recognition 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