Two hours

UNIVERSITY OF MANCHESTER
SCHOOL OF COMPUTER SCIENCE

Interactive Technologies and Design

Date: Tuesday 26th May 2009
Time: 14:00 – 16:00

Please answer Question ONE and TWO other questions

This is a CLOSED book examination

The use of electronic calculators is NOT permitted
1. **Compulsory**

Darwin suggested that there are a number of fundamental facial expressions.

a) What are these expressions? (2 marks)

b) Discuss what parts of the face are involved in making each expression. (3 marks)

c) Describe, in general, how an image of a face might be processed to recognise each expression. (3 marks)

d) Could this method be successfully applied to images of any person? (2 marks)

e) What is a wiki? What are the potential costs and benefits of using a wiki to support university education? (10 marks)

2. I control devices at home using quite simple switches. For example, I turn lights on with a switch on the wall, the heating is controlled by a simple programmer that controls on-off cycles plus a thermostat to control temperature. How could my home be instrumented to reduce the number of switches that are involved?

Factors you should consider are:

a) What type of input will be used: sound, images, a handheld device? Justify your choice(s). (2 marks)

b) How will you indicate what device is to be controlled? Consider the scenario of the homeowner sitting in the lounge and trying to control the heating, the tv, or close the curtains. (3 marks)

c) Some devices have simple controls: a light switch can only change states between on and off. But other devices are more complex: the dvd player can be turned on or off, I can play, fast forward, skip, search forwards or backwards, etc. How can these devices be controlled? (6 marks)

d) Is it possible to define a toolkit of control signals that are suitable for all devices? If so, how would this be done? (6 marks)

e) Are there any devices that do not require my input to work correctly? If so, how are they controlled? (3 marks)
3. It is possible to build computer systems that interpret and react to a user’s gestures, rather than commands issued in a conventional manner.

Give two examples of users who might benefit from gesture based interfaces. (2 marks)

For each example:

a) Discuss the type of gesture that might be recognised. (2 marks)

b) For one of the examples, describe what is required of the data that is to be collected, and define how the data is collected. (4 marks)

c) Describe how the data is processed in order to extract information that will allow the gestures to be recognised. (4 marks)

d) Describe the methods that could be used to recognise the gestures that are made. How suitable would each method be for processing data from the other example? (8 marks)

4. a) Describe one decision making model of how people choose products on the web. (8 marks)

b) How might the interactive properties of a device, particularly the time costs of action, impact a purchaser’s decision making strategy? (8 marks)

c) Critique the claim that one reason that images are a useful feature of an e-commerce web site is that they encourage revisits? (4 marks)

5 a) Describe Buxton’s (2007) framework of multi-touch interface dimensions. (8 marks)

b) What are the costs and benefits of the interactive properties of a multi-touch interface? (8 marks)

c) Critique the claim that multi-touch is particularly useful for collaborative work, e.g. when two or more people solve a jigsaw puzzle. (4 marks)

END OF EXAMINATION