UNIVERSITY OF EDINBURGH

COLLEGE OF SCIENCE AND ENGINEERING

SCHOOL OF INFORMATICS

INFR11017 HUMAN-COMPUTER INTERACTION (LEVEL 11)

Friday 15th May 2015

09:30 to 11:30

INSTRUCTIONS TO CANDIDATES

Answer any TWO questions.

All questions carry equal weight.

CALCULATORS MAY NOT BE USED IN THIS EXAMINATION

Year 4 Courses

Convener: I. Stark
External Examiners: A. Cohn, T. Field

THIS EXAMINATION WILL BE MARKED ANONYMOUSLY

1. (a) Discuss the differences between conceptual design and detailed design. Do you think it is important to differentiate between the two stages? Why, or why not? [*5 marks*]

   (b) Describe the following Interaction Types:

      i. Instructing
      ii. Conversing
      iii. Manipulating
      iv. Exploring

   [*4 marks*]

   (c) List *two* advantages and *two* disadvantages for each of the Interaction Types listed above. [*8 marks*]

   (d) Give *one* example of a practical interface for each Interaction Type and justify your choice. [*8 marks*]

2. You have been presented with a brief in Interaction Design to develop the concept of a head-up display (e.g., based on Google Glass) for cyclists viewing a map when navigating around a city. It is controlled by gestures to indicate the desired actions, e.g., choosing the destination from a list, zooming in and out, and scrolling the map in one of the four cardinal directions - north, east, south and west.

   (a) Provide a conceptual model for the system, specifying the underlying metaphor, and outlining the concepts, the functions and their relationships. The solution should be as simple as possible in order to ensure safe riding. [*6 marks*]

   (b) Describe ways that the features of the bicycle itself might form the basis for a tangible user interface, and an augmented reality interface. Explain what sensor processing would be involved. How might the two alternative interfaces be compared experimentally? [*8 marks*]

   (c) Explain how you might involve other potential users at the requirements specification stage to derive a comprehensive understanding of the requirements. [*5 marks*]

   (d) Provide a detailed specification and justification of how you would carry out user evaluation of a prototype system (e.g., number and type of participants, independent and dependent variables, data analysis methods). [*6 marks*]

3. (a) i. Define briefly the idea of affordance as used in the field of Interaction Design. [*2 marks*]

ii. Give two examples each of Physical, Semantic, Cultural and Logical constraints. [*8 marks*]

(b) Interface metaphors and analogies are commonly used as part of a conceptual model to convey to users what a product does and how to use it for an activity.

i. Give four *disadvantages* of using interface metaphors. [*4 marks*]

ii. Give an example of a metaphor which in your view has been successful, and another which has not, stating the reasons for your choice. [*6 marks*]

(c) What is Fitts' law? Explain what variables would affect the interaction times when switching between controlling different devices. [*5 marks*]