UNIVERSITY OF EDINBURGH

FACULTY OF SCIENCE AND ENGINEERING

MASTER OF SCIENCE IN COMPUTER SCIENCE

HUMAN-COMPUTER INTERACTION

Wednesday 26 April 2000

9:30 to 11:00

Examiners:

I. Watson (External)

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INSTRUCTIONS TO CANDIDATES

Answer any TWO questions.

All questions carry equal weight.

1. (a) Consider natural language-based interfaces. Many HCI researchers have been sceptical of their utility, although some—such as Gentner and Nielsen—have argued in their favour. Provide three reasons for, and three reasons against, the use of natural language in HCI. *[6 marks]*

   (b) Consider this example of a spoken dialogue system using speech recognition and synthesis:

   A1 Annie here.
   U1 Hello Annie, could you give me the information on a meeting I have tomorrow?
   A2 What was that?
   U2 I need to find out uh, a meeting time and place. Kim sent me a message about it.
   A3 For all options say help me out.
   U3 Help me out.
   A4 Help. Say call or say send a message, followed by a label or a number. Or say get my messages [User interrupts]
   U4 Get messages. [Annie hears "Get me SIPS."]
   A5 Speech and Image Processing Lab.
   U5 Cancel.
   A6 Annie here.
   U6 Help.
   A7 Help. Say call or say send a message ... [User interrupts]
   U7 Get messages. [Annie hears "Get me SIPS."]
   A8 Speech and Image Processing Lab.
   U8 Help.

   i. Identify the primary cause of the problem in this particular dialogue, and identify the nature of a usability problem revealed by the system's responses.
   ii. Suggest at least one guideline to be followed in re-designing to eliminate the usability problem.
   iii. Indicate a dialogue feature you should implement, and what information about the interaction would need to be captured to support it. *[6 marks]*

   (c) Suppose you have been asked to compare the original spoken dialogue system and a version which has been developed, implementing your redesign. Specify and justify two general criteria you would use to measure the effectiveness of the two systems. *[4 marks]*

   (d) Using the two criteria, indicate how you would empirically evaluate the two systems, stating what kinds of data you would collect, and how you would analyse it. *[9 marks]*

2. (a) Two basic usability principles are:

   i. learnability
   ii. robustness

   For each of the above, describe three relevant contributory principles and give an illustration of the application of each to user interface design. [*10 marks*]

   (b) Consider adaptive user interface management systems. State the distinction between an adaptive system and an adaptable one, and give two reasons for preferring the former. Distinguish at least two kinds of adaptivity, and indicate the key components of an adaptive UIMS architecture. [*7 marks*]

   (c) Consider Nielsen's classification of web design mistakes. For each of the items in the following list, indicate whether it is (A) a mistake characteristic of early web design, (B) a mistake which emerged later, or (C) neither. In each case, indicate why it falls into the relevant category, and the usability consequences of the item. If you consider an item to be of type A, indicate to what extent it is still a problem.

   i. Lack of biographies
   ii. Outdated information
   iii. Using frames
   iv. Anything that looks like advertising
   v. Long scrolling pages
   vi. Doing the same as everybody else
   vii. Breaking or slowing down the back button

   [*8 marks*]

3. Successfully embedding new systems within existing organisations requires an understanding of human factors within the organisational context, as well as design practices which build on this understanding.

   (a) Identify and comment on three relevant human factors issues influencing organisational users' responses to new systems. [*7 marks*]

   (b) Consider the range of possible user participation-based evaluation techniques. Select one which would be appropriate at early stages in designing a new support facility for group working, and one which would be more appropriate later on. Explain why they differ in this respect. Illustrate by showing how they could be applied to groupware with which you are familiar. [*12 marks*]

   (c) Discuss the possible obstacles in the way of implementing the selected techniques in an organisational context. Contrast those obstacles which are likely to arise from the client organisation, and those which arise from the design organisation. [*6 marks*]