

UNIVERSITY OF LONDON

GOLDSMITHS COLLEGE

B. Sc. Examination 2013

COMPUTING AND INFORMATION SYSTEMS

IS53008A User Interface Design – RESIT

Duration: 2 hours 15 minutes

There are five questions in this paper. You should answer no more than THREE questions. Full marks will be awarded for complete answers to a total of THREE questions. Each question carries 25 marks. The marks for each part of a question are indicated at the end of the part in [.] brackets.

There are 75 marks available on this paper.

No calculators should be used.

**THIS PAPER MUST NOT BE REMOVED
FROM THE EXAMINATION ROOM**

Question 1 Usability and user experience

- (a) You are designing an online educational game for children aged 10 to help them learn maths. What methods would you undertake for gathering user requirements and why? [4]
- (b) State five things you might have to consider in terms of the user's physical characteristics . [5]
- (c) State two usability and two user experience goals might your game have and suggest how these could be measured. [8]
- (d) Imagine you have been asked to go into a school to see a prototype of your game being played by a group of children. You are to undertake direct observation. What problems might you experience with this method? Is it worthwhile? [8]

Question 2 Understanding the user

- (a) The Gestalt approach emphasises that we perceive objects as well-organized patterns rather than separate component parts. How might we use this knowledge in interface design where users must input personal information on a web site? Use diagrams and illustrations where appropriate. [5]
- (b) Suggest three ways that sound can be used as part of an interface. Give examples. [6]
- (c) Fitts' Law, a model of human movement, takes the form

$$\textit{Movement time} = a + b \log_2(\textit{distance/size} + 1)$$

where a and b are empirically determined constants.

- i. Explain what this means in terms of a user using a mouse to move to a target on screen. [3]
- ii. What implications does Fitts' Law have for interaction design? [3]
- (d) Discuss the impact of the limitations of human memory on interactive user interface design. Provide examples to support your answer. [8]

Question 3 User requirements and task analysis

- (a) What is the difference between a scenario and a persona? [2]
- (b)
 - i. Explain who the stakeholders are for a new model of a mobile phone? [4]
 - ii. How would the success of the mobile phone affect each one of them? [4]
- (c) Write a scenario for making a phonecall on a mobile phone where the number is already stored in the phone. [2]
- (d) Task analysis can be used to describe a situation in terms of the user's actions.
 - i. Explain the premise of Hierarchical Task Analysis [3]
 - ii. Write a Hierarchical Task Analysis for the scenario mentioned above. [6]
 - iii. Draw the above Hierarchical Task Analysis in graphical form [4]

Question 4 Concepts and models

- (a) Describe how a user develops his or her model of a computer system. Give examples to illustrate your answer. [5]
- (b) The term “mental model” was developed by Craik in the 1940s.
- i. What is meant by “mental model”? [2]
 - ii. Explain a disadvantage of using a mental model. Give an example. [2]
 - iii. How can mental models be used in interface design? [2]
- (c) Norman 1986 theory of action introduces the concept of the Gulf of Execution and Gulf of Evaluation.
- i. How can a user bridge the Gulf of Execution? [1]
 - ii. How can a designer bridge the Gulf of Execution? [1]
 - iii. How can a user bridge the Gulf of Evaluation? [1]
 - iv. How can a designer bridge the Gulf of Evaluation? [1]
- (d) How would you apply an understanding of mental models and metaphor if you had to design the interface and the metaphor to be used for an address book application synched to your mobile phone and notebook computer [10]

Question 5 Evaluation

- (a) Why is it important to test an interface design early in the software development cycle? [2]
- (b) Interviews with users can be unstructured, structured or semi-structured. Explain each of these terms. [3]
- (c) Predictive evaluation models such as GOMS allow analyses of interfaces without involving actual users. Explain how this is possible, why this might be useful, and give two reasons why its usefulness might be limited. [5]
- (d) Heuristic evaluation is a method of analytical evaluation.
 - i. Explain the process of heuristic evaluation. [5]
 - ii. Explain Nielsen's set of heuristics. [10]