Goldsmiths College

UNIVERSITY OF LONDON

Department of Computing

BSc Examination 2006

CIS322: USER INTERFACE DESIGN

Duration: 2 hours 15 minutes
This paper consists of 4 questions. Each question carries 25 marks
Answer any 3 questions

THIS EXAMINATION PAPER MUST NOT BE REMOVED FROM THE EXAMINATION ROOM

QUESTION 1

a. Enumerate **two** advantages of GUIs (Graphical User Interface). [2]
b. Describe the concept of **direct manipulation** in GUIs. [3]
c. Give **two** examples of direct manipulation in GUIs. [2]
d. A principle of GUI design is to minimize the memorizing effort of users. Discuss, in brief, **three** ways of achieving this. [3]
e. Give **three** schemes of ordering screen data and content. [3]

Scenario

Requirement 1: You are asked to design an interface for a screen based information system in a zoo.
Requirement 2: The user group is children of 4 to 6 years old, who are not capable of reading and writing.
Requirement 3: The users have to be able to navigate easily and get information about the animals.
Requirement 4: The users can use touch screens and customized joy-sticks.

The following sub-questions relate to this scenario:

f. State **two** design criteria and explain the way you apply them to the design of button objects in order to suit the target group. [4]

g. Users of the above age group tend to be motivated to acquire information by playing.

Illustrate **two** examples of how the users could be motivated while they navigate. [4]

h. Assume that the users have to use a joy-stick to navigate. (the joy-stick can **only move horizontally and vertically**)

Give **two bad** examples of buttons arrangement on the screen and explain why these are bad choices. [4]

QUESTION 2

a. Enumerate **two disadvantages** of GUIs (Graphical User Interface). [2]
b. Present **three** common usability problems encountered in GUIs. [3]
c. Describe the notion of **mental model.** [3]
d. Discuss, in brief, **four** guidelines for designing good conceptual models in GUIs. [4]

Scenario

Requirement 1: You are asked to design a web interface for a Museum.
Requirement 2: The museum site consists of 4 sections (North, South, East, and West)
Requirement 3: The main **theme of the current exhibition is "Opening the Worlds."**
Requirement 4: The users can download big multimedia materials.
Requirement 5: The user groups vary in the ability navigate websites.
Requirement 6: One of the user groups is deaf people.

The following sub-questions relate to this scenario:

e. Give **two** examples of how deaf users could be helped in interacting with the website, and explain your choices. [4]

f. The design of the navigation system can be based on "metaphors" from the real world.
Choose **two** metaphors that suit the spatial arrangement of the website (4 sections: North, South, East and West) and the main theme of the exhibition, and **illustrate** how they could be applied to the navigation system. Draw **a rough sketch** of your design alongside the textual description [7]

g. Describe **one** possible problem that could be encountered by users downloading big multimedia materials and give a solution for them. [2]

QUESTION 3

a. Describe the notion of **tangible interface**. [2]

b. Describe the notion of **wearable computing.** [2]

c. Describe, in brief, **two** criteria that have to be considered when designing tangible interaction. [2]

d. Discuss the importance of **(1) location, (2) movement,** and **(3) spatial arrangement** in the context of ubiquitous computing. (Try to gauge your answer to contain a minimum of 30, and a maximum of 50 words for each aspect.) [6]

Scenario

Requirement 1: You are asked to develop a tour guide system for a museum

Requirement 2: The system has to get information of visitors' location in the museum.

The following sub-questions relate to this scenario:

e. Visitors' movements and positions in relation with the position of an artwork can indicate their interest in the artwork.

Illustrate how the system can detect a visitor's interest in an artwork, describing:

i. **Two** situations indicating a visitor's interest in an artwork.
ii. What types of sensors could be employed to detect the situations.
iii. Where the sensors would be placed.
iv. How the sensors would work. [6]

f. You have to design a **virtual museum** that allows visitors to explore some of the artwork using **tangible (haptic) interface, and/or virtual reality.**

Illustrate how you would design the system, describing:

i. The format(s) or type(s) of experience the visitors would get.
ii. The device(s) that would be employed.
iii. The technology that would be applied. [7]

QUESTION 4

a. Describe the notion of **invisible computing** using the terms of **implicit input** and **implicit output**. [4]
b. Describe, in brief, **two** criteria that have to be considered when designing wearable computing. [2]
c. Present the basics of the RFID Technology. [3]
d. Explain the difference between **active** and **passive** RFID tag. [2]

Scenario

Requirement 1: You are asked to develop a health monitoring system in a hospital.
Requirement 2: The system has to provide doctors with **real-time** information and **records** of patients' conditions.
Requirement 3: The doctors should be able to access the information **wherever they are in the hospital**.
Requirement 4: The doctors should be able to carry on their activities hands-free while they get the information from the system.

The following sub-questions relate to this scenario:

e. Illustrate the system you would design, describing:
   i. What technology would be employed to allow the system to connect to the intranet of the hospital.
   ii. How the system could be designed to meet requirements 3 and 4.
   iii. What kinds of display devices would be used for doctors to visualize the information.
   iv. How the system works. [9]

f. Explain **two** examples of how doctors could use RFID technology to identify patients and the benefits of using this technology. [5]