

**OLLSCOIL NA hÉIREANN**  
**THE NATIONAL UNIVERSITY OF IRELAND**  
**COLÁISTE NA hOLLSCOILE, CORCAIGH**  
**UNIVERSITY COLLEGE, CORK**

**Summer Examinations 2010**

**CS2511 Usability Engineering**

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**Time: 1.5 Hours**

Answer *all* Questions  
All questions carry equal marks

The use of calculators is permitted

1

- (a) The World-Wide Web Consortium has proposed a number of guidelines as part of its Web Accessibility Initiative (WAI). Guideline number 5 of version 1.0 of the guidelines states:

Create tables that transform gracefully.

Explain what is meant by *transform* in this context.

Using an example (e.g., a calendar), discuss how you would create a table that transforms gracefully.

(9 marks)

- (b) State Fitts' Law and explain its significance.

Compare the use of menus in Microsoft Windows and the Macintosh OS in the light of Fitts' Law.

(9 marks)

- (c) Using KLM, the task of closing a window by selecting 'close' from a menu is modelled as follows:

$$\mathbf{P}[\text{to menubar}] \mathbf{B}[\text{LEFT down}] \mathbf{M} \mathbf{P}[\text{to option}] \mathbf{B}[\text{LEFT up}]$$
$$T_{\text{execute}} = 2t_P + 2t_B + t_M$$

Explain the meaning of each of the terms.

Suggest ways in which accuracy of the KLM model of this task could be improved.

(12 marks)

2

- (a) Explain the major differences between the following interaction styles, indicating the type(s) of application each is suited to.

Command-Line  
Form-Fill  
Menu-Selection  
Direct-Manipulation

Suggest some guidelines for use with each style of interaction.

(10 marks)

(b) Explain the meaning of the following terms:

Re-engineering and mental models  
Task Analysis and Cognitive Modelling  
Normative, Expressed and Felt needs

(10 marks)

(c) A used-car dealer has commissioned you to develop an interface for its new, online search tool. The tool will allow customers to search the company's database and obtain a set of results matching broad criteria (make and model of car, price, colour, age, mileage, etc.). Users will then be able to interactively sort and filter the data on the client-machine.

Describe an interface that would allow interactive sorting and viewing of such data. Include a sketch or diagram if appropriate.

Explain how your proposed solution would provide/support:

overview  
filter  
zoom  
details-on-demand

(10 marks)

3

(a) You have been asked to evaluate the data from a usability study. The aim of the study was to compare two user-interfaces, A and B, which were designed for use on a piece of medical equipment. The subjects were all medical doctors and they were divided into two groups. Each subject performed the same task, but those in one group used interface A while those in the other group used interface B. The data collected represents the number of errors made by each group while performing the task a set number of times. The subjects who used interface A made fewer errors on average than those who used interface B. In order to determine if the difference in error-rates is significant, it is proposed that the data be analysed using a statistical test.

State which statistical test you would use, and explain the reasons for your choice.

(9 marks)

(b) Explain the meaning of the following terms:

Nominal, Ordinal and Interval data  
Normal Distribution  
One-tailed and Two-tailed predictions

(9 marks)

- (c) It has often been predicted that we will one day be able to interact with computers entirely through speech. However, despite enormous advances in speech recognition and related technologies, speech-based interaction remains confined to a few specialised applications.

Describe the major problems involved in creating speech-based interfaces to interactive systems, and discuss their significance for the future development of such systems.

*(12 marks)*