

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

Summer Examinations 2011

CS2511 Usability Engineering

Dr. C. Shankland
Professor J. Bowen
Dr. I. Pitt

Time: 1.5 Hours

Answer *all* Questions
All questions carry equal marks

The use of calculators is permitted

1

- (a) It has often been predicted that conventional GUIs will soon be replaced with 3D interfaces. However, while the technology to display 3D graphics is now generally available, 3D interfaces are used only in a few, specialised applications.

Describe the major factors involved in 3D visual perception and discuss their significance for the future development of such systems.

(12 marks)

- (b) Studies have shown that people experience more difficulty reading text from a computer display than from a printed sheet. Summarise the research findings in this area, and suggest some measures that might be taken to minimise these problems when presenting text on computers.

(6 marks)

- (c) A number of statistical tests are commonly used to analyse data gathered during usability testing.

Explain why so many different tests are needed, indicating the type of data each is designed to analyse. Give an example of a test that might be used to analyse each type of data.

(12 marks)

2

(a)

Briefly explain the meaning of the following terms:

- (i) Null and alternate hypotheses
- (ii) Normal distribution
- (iii) One-tailed versus two-tailed

(9 marks)

- (b) Cognitive models are classified variously as *task/goal hierarchies*, *linguistic/grammatical models*, and *physical/device-level models*. Using examples, compare the three types of model, noting their relative advantages and disadvantages.

Explain how cognitive modelling differs from other modelling/analysis techniques, such as task analysis.

(12 marks)

(c) Briefly explain the meaning of the following terms:

- (i) Sensory memory
- (ii) Structural and functional mental models
- (iii) Fitts' law

(9 marks)

3 Miller (1956) reviewed research-findings on human memory and came to the now-famous conclusion that our short-term memories can hold 'seven plus-or-minus two' items of information.

Discuss the capacity of human short-term memory in the light of Miller's conclusions, and consider the implications of this knowledge for interface designers.

(9 marks)

(b) Listed below are three of Shneiderman's Eight Golden Rules for Interface Design.

- (i) Strive for consistency
- (ii) Design dialogs to yield closure
- (iii) Reduce short-term memory load

Using examples, show how each of these guidelines might be applied in practice.

(12 marks)

(c) An important aspect of Usability Engineering is user-profiling - identifying the target users, gathering relevant information about them, and assembling this information in such a way that it can be used by developers.

Using examples, explain the meaning of the terms *segmentation* and *persona* in the context of user-profiling.

Describe the advantages of using segmentation and personas compared with other approaches to user-profiling.

(9 marks)