UCL Computer Science Examination Paper

Paper Details

Academic Year:	2022/23
Module Title:	Perception and Interfaces
Module Code:	COMP0160
Exam Period:	Central Assessment Period: Main Summer
Duration:	2 hours
Deliveries for which suitable:	A7P (Postgraduate Taught, Level 7)
Cohorts for which suitable:	2022-23

Instructions

There are TWO questions in total.

Answer ALL TWO QUESTIONS.

A maximum of 50 marks is available: 25 marks for Question 1, and 25 marks for Question 2. The marks available for each part of each question are indicated in square brackets [n].

Submit your answers as a single PDF file. Any handwritten answers should be scanned and compiled according to the guidance provided by the UCL Central Assessment Team.

QUESTION 1

(a) You have designed an interface environment, of your choice, that needs to be evaluated. For this interface environment you need to assess whether the user can detect a change in stimulus light level within the interface environment.

(i). Describe how you would design a detection task using the method of constant stimuli to evaluate the interface with participants. In your answer include a description of the stimulus to be used, the procedure used, and the measure(s) recorded.

[6 marks]

(b)

(i). Describe the key features of a psychometric function.

[4 marks]

(i). Describe how using a psychometric function you may obtain a measure of the 50% threshold point for the data obtained in the study described in section (a) above.

[6 marks]

(c)

(i). In signal detection theory what is meant by a “false alarm” and a “correct rejection”.

[2 marks for each description; Total 4 marks]

(ii). How may you use a Receiver Operating Characteristic curve to evaluate if some participants were using a different criterion for conducting the detection task in the study described in section (a) above.

[5 marks]

[Total for Question 1: 25 marks]

QUESTION 2

You would like to construct an interface environment that can be used to assess whether participants can fail to perceive an unexpected visual event in plain sight (inattentional blindness).

(a) Provide an example of inattentional blindness.

[4 marks]

(b) How may you design an experimental condition to test for inattentional blindness. Provide an explanation of your design choice.

[10 marks]

(c) How would you design a control condition to compare with your experimental condition described in part b) above?

[5 marks]

(d) What kind of statistical test could you use to compare findings between your experimental and control condition. Provide a reason for your answer

[6 marks]

[Total for Question 2: 25 marks]

END OF PAPER