UCL Computer Science Examination Paper

Paper Details

Academic Year:	2022/23
Module Title:	Perception and Interfaces
Module Code:	COMP0160
Exam Period:	Practice Exam
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) Describe the main components of the 2 main early selection models of attention. How do these 2 models differentially deal with the attentional bottleneck

[6 marks]

(b) What can a feature-search task tell us about feature-based attention?

[3 marks]

(c) You are tasked with designing a virtual-reality driving simulator, in which users can experience a visual and auditory experience of driving when using a virtual reality headset.

(i) What approach could you take to ensure that the sounds presented over headphones are correctly localised by the users?

HRTFs

[8 marks]

(ii) You would like to evaluate how users in the driving simulation notice pedestrian movement. Explain briefly how you address such a question by designing a study to investigate visual change blindness.

measure

who

control condition

base line

[8 marks]

[Total for Question 1: 25 marks]

实验条件：
控制组：在虚拟现实环境中进行常规驾驶，**不引入行人。**
实验组：在相同的虚拟环境中进行驾驶，但随机引入行人穿越马路的情况。

变量定义：
自变量：行人的出现**（有无）。**
因变量：参与者的反应时间和准确性**（是否及时并正确地响应行人的出现）。**

数据收集方法：
使用眼动追踪技术来记录参与者在驾驶过程中的视觉焦点。
通过模拟器记录参与者的反应时间和制动、转向等操作的数据。

QUESTION 2

(a) What is the ventriloquism effect?

[2 marks]

(b) How does the ventriloquism effect differ from the McGurk effect?

[2 marks]

(c) What is meant by spatial congruence?

[2 marks]

(d) You are creating a novel display screen that can provide feedback in the form of visual and audio output.

(i) How may you take the flicker-flutter illusion into account when designing the output to be effective?

[6 marks]

(ii) How may you design a constant stimuli task to evaluate the users' detection of the visual response of your display screen?

[5 marks]

(iii) Sketch a typical psychometric function that may represent users' detection versus visual response of the screen

[7 marks]

(iv) Explain what the 75% point on the psychometric curve represents

[1 mark]

[Total for Question 2: 25 marks]

END OF PAPER