BSc, BEng and MEng Degrees Examination 2020-21

DEPARTMENT OF COMPUTER SCIENCE

HUMAN-COMPUTER INTERACTION 2 (HCI2)

Open Individual Assessment

Issued: Wednesday 28th October 2020, 12:00 noon
Submission due: Wednesday 13th January 2021, 12:00 noon
Feedback and marks due: Wednesday 10th February 2021, 12:00 noon

All students should submit their answers through the electronic submission system: http://www.cs.york.ac.uk/student/assessment/submit/ by **Wednesday 13th January 2021, 12:00 noon**. An assessment that has been submitted after this deadline will be marked initially as if it had been handed in on time, but the Board of Examiners will normally apply a lateness penalty.

Your attention is drawn to the section about Academic Misconduct in your Departmental Handbook: https://www.cs.york.ac.uk/student/handbook/.

Any queries on this assessment should be addressed by email to Dr Jo Iacovides (jo.iacovides@york.ac.uk) or Dr Leonardo Sandoval Guzman (leonardo.sandoval@york.ac.uk). Answers that apply to all students will be posted in the Discussion Board on the VLE site for HCI2. No queries will be answered more than 6 weeks after hand-out.

Rubric:
This assessment contains five questions. You should answer all parts of all five questions. Where specific word limits are given for a particular answer, any words beyond those limits will not be marked. The work should be single-spaced, using a 12-point Sans Serif font. No programming is required as part of this assessment. Instead, all answers will be judged on the soundness of the application of the concepts, theoretical approaches and ethical values learnt in the module to the problems described in each question.

Your exam number should be on the front cover of your assessment. You should not be otherwise identified anywhere on your submission.

Question 1 [16 marks]

Fitbit fitness trackers are a popular example of a wearable technology. A Fitbit can track data about users' activity, exercise, food, weight and sleep. Users access this data through a dashboard on their app or computer that displays visualisations of their stats, and allows them to set goals and share their progress with others. As with any other interactive technology, interacting with Fitbit requires the use of multiple capabilities.

A. Identify three perceptual, cognitive or memory processes involved in the use of Fitbit and explain how they relate to its use. (150 words) [6 marks]
B. Pick one of the abilities you have identified and discuss:
    a. Two problems that a user might encounter when using such a device (100 words). [4 marks]
    b. What changes could you make to the design of Fitbit that would overcome one of these problems? (150 words) [6 marks]

Question 2 [16 marks]

As part of a UX design team, the Natural History Museum in London wants you to create an interactive experience that will help people visiting the museum in person to explore the different eras of dinosaurs.

A. Give two examples of how different pervasive computing interfaces could be used to address this brief (150 words). [6 marks]
B. Select one of these ideas and apply the theory of distributed cognition to explain how it would support the situated use of this technology in the museum (100 words). [4 marks]
C. Suggest how you would evaluate the interactive experience and justify your choice of methods (150 words). [6 marks]

Question 3 [18 marks]

Select and read one of the following papers:

- Hassenzahl, M. (2003). The thing and I: Understanding the relationship between user and product. In M. Blythe, C. Overbeeke, A. F. Monk, & P. C. Wright (Eds.), Funology: From usability to enjoyment (pp. 31–42). Dordrecht, the Netherlands: Kluwer Academic
- Mekler, E.D, and Kasper Hornbæk. K. (2019). A Framework for the Experience of Meaning in Human-Computer Interaction. In Proceedings of CHI Conference on Human Factors in Computing Systems (CHI '19), May 4–9, 2019, Glasgow, Scotland UK. ACM, New York, NY, USA

A. Briefly describe an interactive technology you have used recently e.g. mobile app, video game, website, wearable etc. (50 words) [2 marks]
B. Apply the framework in the paper you selected from the list above to analyse your experience of using this technology. (200 words) [8 marks]
C. Discuss the strengths and limitations of the theory or framework you have applied i.e. how does it capture/fail to capture different aspects of your experience? (200 words) [8 marks]

Question 4 [20 marks]

Select an application from the list below. Write up an article for the student newspaper (350-500 words) that explains how a value-based design approach could be used to address ethical issues in relation to the application. Your article should contain the following:

- A brief description of the application. [2 marks]
- A reference to an academic or online article that discusses the application in relation to an ethical concern. [2 marks]
- A description of how this ethical concern could influence the user experience. The description should also consider whether the issue has violated either the ACM Code of Ethics and Professional Conduct (https://www.acm.org/about-acm/acm-code-of-ethics-and-professional-conduct) or the BCS Code of Conduct (www.bcs.org/category/6030). [4 marks]
- An explanation of how incorporating values into the design process may have avoided or helped overcome the ethical concern. The explanation should include an example of a specific value that could have been taken into account. [6 marks]
- A justification of a design suggestion that would mitigate the ethical concern raised in the article. [6 marks]

List of applications:

- Pokemon Go
- TikTok
- Nextdoor
- Candy Crush
- Amazon Echo
- Facebook

Question 5 [30 marks]

Space X and NASA have chosen you to design a new interactive system to support the experience of commercial human space travel. You are free to suggest any type of interactive system (e.g. communication and control systems, wearables for crews and passengers, entertainment etc.). Your system could be used before, during or after space travel. Remember to consider that space missions could involve different users in a wide range of situations and settings.

Use the following template to briefly describe this interactive system and to consider how each of the three waves of HCI applies to the technology you have selected.

Technology proposed:	
A. Briefly describe this technology and its main users. Explain its main features, primary users and how they will interact with it. (50 words) [3 marks]	
First wave considerations	
B. Describe two user capabilities (perceptual or cognitive) that users require in order to interact with the technology? (50 words) [4 marks]	
Second wave considerations	
C. Who else would be involved in or affected by interactions with the technology? (50 words) [2 marks]	
D. What main user goal does the technology aim to support? (100 words) [3 marks]	
E. How do you think the interactions with the technology might differ in accordance to context of use (e.g. around other people, in different locations etc) (100 words) [3 marks]	
Third wave consideration	
F. What is the intended user experience of the technology? (50 words) [3 marks]	
G. Explain how the technology reflects two different values (whether positive or negative). (200 words) [6 marks]	

H. To what extent do you think the technology will be successful in delivering the intended experience? Why/why not? (200 words) [6 marks]	

END OF PAPER