Xi'an Jiaotong-Liverpool University

西交利物浦大学

Semester 2, 2021/22 Final Exam

Undergraduate - Year 3

Human-Centric Computing

Exam Duration: 2 Hours

Crash Time Allowed: 15 Minutes

Instructions to Candidates

1. This is a remote open-book examination. Please tick the integrity disclaimer immediately when uploading your answers on LMO and complete the assessment independently and honestly.

2. Total marks available are **100 marks**. This exam consists of **three questions** in total. The mark allocated for each question is indicated at the end of the question.

3. Answer **ALL** questions. There is **NO** penalty for providing a wrong answer.

4. Write down your solutions on **blank or lined A4 sheets**. List **ALL** the sources you used to answer the questions at the beginning of your answer sheet. Clearly indicate the **question numbers** before your solutions.

5. Only **English** solutions are accepted. Answers need to be handwritten and fully and clearly scanned for submission as **one single PDF document** via LMO upon completion of the exam. Make sure your writings are clear to read.

6. The duration is **2 hours**. An additional **15-minute** crash time beyond the exam duration will be allowed for you to report and resolve minor technical issues which may be encountered during the exam. Where there are any major problems preventing you from continuing the exam or submitting your answers in time, please do not hesitate to email the Module Examiner or Assessment Team of Registry (assessment@xjtlu.edu.cn).

Paper Code: CPT208/21/22/S2/Final

Question 1 Design   (40 marks)

(a) What are the **four** basic activities of interaction design? Please draw the design lifecycle. Discuss how you have followed this in your group project. Give specific examples. [10]

(b) Is the Learning Mall login page a good design or a bad design? Please justify your answer using at least **two** design principles. How do design principles inform the interaction design? [10]

(c) The university is planning to adopt a user-centered approach to redesign the Learning Mall login page. Who should be involved in the design? Are they users or stakeholders? What is the difference between users and stakeholders? What are the benefits of involving them? [10]

(d) We talked about **five** interaction types in the class. Explain how Learning Mall supports these interactions using specific examples. [10]

Sol:

a) Group project: My group project designed an AI-powered to-do list application. It strictly follows the Life-Cycle Model: 1. The project begins with discovering requirements, focusing on understanding user needs and pain points. We mainly use questionnaire and face to face interview to collect users requirements. 2. Based on the requirements gathered, the first design phase is undertaken. This stage involves planning and creating initial design alternatives to meet user needs. 3. After that, I choose one alterniative from designs and the first prototype is built based on the initial design. 4. The first prototype undergoes evaluation to assess its effectiveness and gather feedback. Those feedback was used to start a new round of iteration.

b) 略

c) 笔记里有

d) 略

Question 2   Prototyping   (30 marks)

(a) What does fidelity mean in a prototype? Please give **two** examples of low-fidelity [10] prototypes and explain how they reflect the main advantages of low-fidelity prototypes.

(b) Please list **five** dimensions in measuring the fidelity of prototypes. How will you [10] design low-fidelity and high-fidelity prototypes in each of the **five** dimensions for a photography system?

(c) Why is the design of icon difficult? What are **two** principles of the icon design? [10] Please draw an icon for the representation of "emergency contact", and justify how it reflects the principles in icon design.

Sol:
a) 略

b) 1. Visual - Low-Fidelity: Hand-drawn sketches of the homepage, gallery view; High-Fidelity: A fully designed digital mockup of the homepage with exact color schemes, fonts, image placeholders, and button styles as they would appear in the final product.
2. Interaction - Low-Fidelity: A clickable wireframe that allows users to navigate from the homepage to the gallery; High-Fidelity: A high-fidelity prototype where users can click on photos to open a detailed view with smooth transitions.
3. Breadth - Low-Fidelity: Wireframes or sketches covering all major features; High-Fidelity: Comprehensive digital mockups or a prototype that covers all aspects of the system.
4. Depth - Low-Fidelity: Detailed sketches or wireframes for specific complex features; High-Fidelity: Interactive prototypes or detailed mockups showing complex feature interactions.
5. Content - Low-Fidelity: Wireframes with Lorem Ipsum text and grey boxes indicating where photos and text will be placed; High-Fidelity: High-fidelity mockups featuring actual text content, high-quality sample photos, and real user-generated content to provide a true sense of the final product.

c) Icon design is difficul, because Meaning of icons is cultural and context sensitive

Question 3   Evaluation   (30 marks)

(a) Identify **two** data gathering techniques that can be used to discover requirements for a takeaway app called *GanFanBa*. For each technique, explain the purpose, how you plan to do it and give specific examples. [10]

(b) A group of students have done a series of work to improve the design of the takeaway app and developed *GanFanBa 2.0*. Now they want to use an experimental study to investigate whether the usability of the app is improved. What are the independent variable and dependent variable? What is the null hypothesis? Provide a detailed experimental plan that describes your preparations, the experimental settings, what users need to do, how to collect, analyse and interpret the data. [10]

(c) As a complement of the *GanFanBa* app, you are asked to design a *SongFanQu* app which is for the delivery men to use. It should support them to take delivery orders, pick up meals from restaurants, and deliver meals to customers. How can you obtain in-depth understanding about their requirements? What, where, when and how can you evaluate your design? Please provide as many details and examples as you can, and make it clear if you are making assumptions and claims. [10]

a) Interview and questionnaire

b) 1. Identify a research hypothesis 2. Specify the design of the study 3. Run a pilot study to test the design, the system, and the study instruments 4. Recruit participants 5. Run the actual data collection sessions 6. Analyze the data 7. Report the results
➜ Reliability ➜ Validity ➜ Ecological validity ➜ Biases ➜ Scope

——— *End of Questions* ———

c) Data Gathering Techniques:
Contextual Inquiry and Interviews and Focus Groups
To observe and understand delivery personnel in their natural working environment.
What: Observe their use of current tools, communication with restaurants and customers, and how they handle deliveries. Where: On the streets, in restaurants, and at customers' locations. When: During peak and off-peak hours to capture a range of experiences. How: Take notes, record observations (with consent), and ask follow-up questions to clarify observed behaviors.

Assumptions:
Delivery personnel have varying levels of familiarity with technology and mobile apps.
The working environment for delivery personnel is dynamic and can be unpredictable.
The primary goal of the app is to streamline the delivery process and reduce friction for delivery personnel.

Claims:
A well-designed delivery app will improve the efficiency and satisfaction of delivery personnel.
Continuous feedback and iterative design based on real-world usage will lead to a more user-friendly and effective app.
Addressing both usability and practical challenges in the design will result in higher adoption rates among delivery personnel.