

The Hong Kong Polytechnic University
COMP3423 Human Computer Interaction
Mid-term Test (25%) Question Paper
Date: 4th November, 2023, 15:30-17:00

[Total 100 marks]

Part A: Multiple Choices (30%, 3 marks each)

Answer ALL questions in this part. Select ONE option only in {A,B,C,D} for an answer.

Question 1 (3 marks)

Which of the following are important in the design focus of HCI?

- A) Thinking of the user
- B) Testing the HCI
- C) Involving the users
- D) All of the above

Question 2 (3 marks)

Which one of these would NOT be found in a good HCI?

- A) Common short cuts, like CTRL+Z for undo.
- B) Icons that can have specific meanings.
- C) A long command line to achieve a function.
- D) Sounds that convey meanings.

Question 3 (3 marks)

Which of these is not an interface style?

- A) Command line/command prompt
- B) Menus
- C) Natural Language
- D) Voice Recognition

Question 4 (3 marks)

Which one of these is a good reason for taking care to design a good computer-human interface?

- A) Not every user is a computer expert
- B) Well designed HCIs allow the software to be sold at a better price.
- C) Well designed HCIs use less computer resources.
- D) Well designed HCIs allow the computer to run faster

Question 5 (3 marks)

Which of the following are examples of paradigms for interaction?

- A) Personal computing
- B) Hypertext
- C) Multi-modality
- D) All of the above

Question 6 (3 marks)

In problem-solving and decision-making, knowledge is regarded as _____ and strategies for solving a problem.

- A) short-term memory procedures
- B) long-term memory procedures
- C) physical memory procedures
- D) short and long-term memory procedures

Question 7 (3 marks)

Concerning the legibility of text:

- A) If lines are too long, the text is hard to read
- B) All upper case improve reading speed
- C) A good font size for flowing text is 10pt
- D) All lower case improves reading speed

Question 8 (3 marks)

If an icon for Word and one for Notepad are put together on the left side of the screen layout and the icons for PowerPoint and Paint together on the right side, then these four icons are arranged according to which pattern recognition principles?

- A) Similarity and proximity
- B) Similarity and continuity
- C) Proximity and closure
- D) Closure and continuity

Question 9 (3 marks)

When typing in “polyu email” on Google, two links appear:

At the top: Email, Messaging and Collaboration Services, leading to information about electronic messaging.

Below that: Sign In, leading to the email Inbox.

When typing in “polyu blackboard” on Google, also two links appear:

At the top: LEARN@PolyU, leading to the Blackboard system.

Below: Sign In, leading to information about Online Teaching Delivery.

Which design principle is violated by this constellation of labels and links?

- A) Reciprocity
- B) Fitts' Law
- C) Production rules
- D) Consistency

Question 10 (3 marks)

The sequence of menu items in the earlier Windows interface **Start > Shut down > Standby > OK** is an example of poor:

- A) Feedback
- B) Syntactic parsing
- C) Semantic priming
- D) Optic flow

End of Part A

Part B: Short Questions (50 marks)

Answer ALL questions in this part.

Question 11 (10 marks)

Describe the two kinds of illusions that a fully immersive Virtual Reality (VR) system uses to give users a sense of reality in a virtual environment.

Answer:

Place Illusion (PI) (1 mark)

- The illusion of being in a place (1 mark)
- despite the sure knowledge that you are not there. (1 mark)
- Realistic perception of senses (e.g.: stereo vision, stereo/3D sound), 360-degree view point. (1 mark)
- Sense of “being there” / Sense of “presence” (1 mark)

Plausibility Illusion (Psi) (1 mark)

- The illusion that what is apparently happening is really happening (1 mark)
- even though you know for sure that it is not (1 mark)
- You are the player in a VR, and then perceive a virtual world responds, which is what you expected, high credibility. (2 marks / 1 mark for partial description for this point)

Question 12 (10 marks)

(a) Describe briefly the *Uncanny Valley* effect. (4 marks) Additionally, please provide one possible strategy for humanoid robots to avoid the Uncanny Valley effect. (2 marks)

(b) Describe briefly the two factors that affect the human experience of presence in VR. (4 marks)

Answer:

(a) It is a hypothesis that

- a person’s response to a humanlike robot (1 mark)
- would abruptly shift from empathy to revulsion as it approached (2 marks)

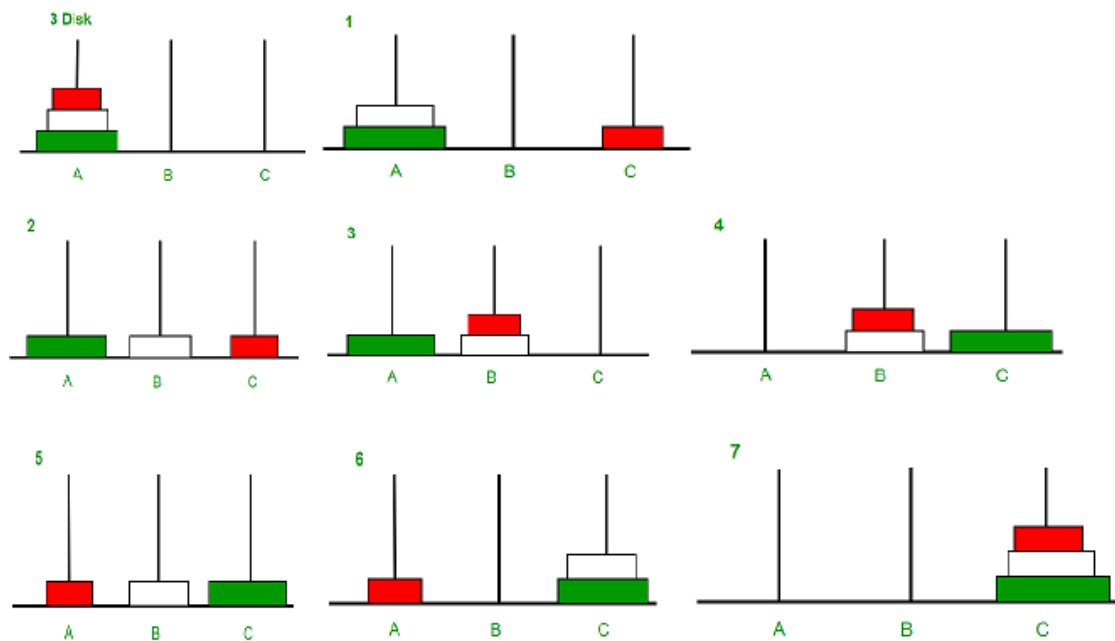
- but failed to attain a lifelike appearance. (1 mark)
- Either increase/decrease the human likeness; (2 marks)

(b)

- Vividness (1 mark) describes how realistic (breath and depth) the media is to the user (1 mark)
- Interactivity (1 mark) describes the two-way communication or action/response from the human user to the system (1 mark)

Question 13 (10 marks)

The following graphic illustrates the solution to the *Towers of Hanoi*, a well-known mathematical problem. Determine whether the “difference reduction” or “means-end analysis approach is to be used, then describe how the used approach works and how it is used to tackle this problem?



Answer:

Means-End Analysis (2 marks for correct name, partial correct no mark)

To reduce the difference between the initial state and the goal state by creating sub-goals (1 mark) until a sub-goal can be reached directly (1 mark)

The initial state = different sized discs being stacked in order of size on the first of three pegs (the “start-peg“). (1 mark)

The goal state = these discs being stacked on the third pegs (the “end-peg“) (1 mark) in exactly the same order. (1 mark)

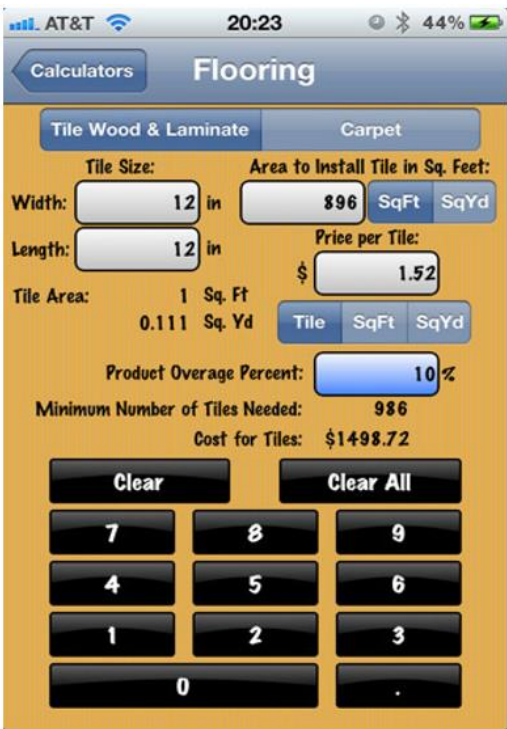
Perform the following sub-goals, recursively until solved

1. Moving the discs lying on the biggest one onto the second peg. (1 mark)
2. Shifting the biggest disc to the third peg. (1 mark)
3. Moving the other ones onto the third peg, too. (1 mark)

Question 14 (10 marks)

Case (a): Determine whether the given mobile app interface is a Good or Poor design. Give two justifications. (5 marks)

Case (b): Determine whether the upper or lower dialog interface is better designed. Give two justifications. (5 marks)

Case (a)	Case (b)
	<div style="border: 1px solid #ccc; border-radius: 10px; padding: 10px; margin-bottom: 10px; background-color: #f9f9f9;"> <p style="text-align: center; font-weight: bold; margin: 0;">Delete Account</p> <p style="margin: 5px 0;">Are you sure you want to delete your account? If you delete your account, you will permanently lose your profile, messages, and photos.</p> <div style="display: flex; justify-content: space-around; margin-top: 10px;"> Cancel Delete Account </div> </div> <div style="border: 1px solid #ccc; border-radius: 10px; padding: 10px; background-color: #f9f9f9;"> <div style="display: flex; align-items: center; margin-bottom: 10px;"> <div> <p style="font-weight: bold; margin: 0;">Delete Account?</p> <p style="margin: 0;">You'll permanently lose your:</p> <ul style="list-style-type: none"> • profile • messages • photos </div> </div> <div style="display: flex; justify-content: space-around; margin-top: 10px;"> Cancel Delete Account </div> </div>

Answer:

Note for TA/Marker: the answer to this question is more flexible. We can give mark(s) for reasonable justifications related to UI/UX design principles. For each bullet/point, give max. 2 marks for detailed answer while 1 mark for a brief or superficial description/explanation)

Case (a):

- Poor design (1 mark)
- Either two of the following or other reasonable answers (s), max. 2 marks each: Too crowded, needs some “white space” / The font is too small / The text label’s font type is hard to read / The text labels are too long, ...

Case (b):

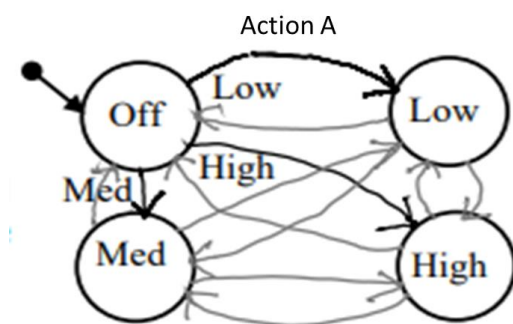
- Lower is better (1 mark)
- Either two of the following or other reasonable answers (s), max. 2 marks each: The text message is too long / With an icon, easy to understand / Highlight Delete button with red/danger color

Question 15 (10 marks)

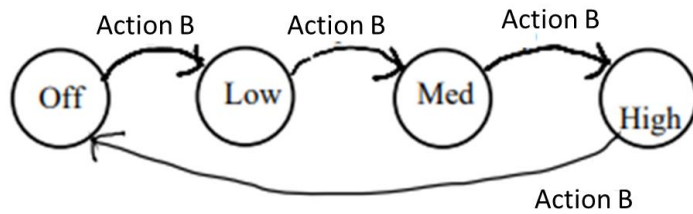
Given the following two STNs showing two different button arrangements of an electric fan. Determine how the buttons are arranged for each STN and draw them. Explain how each STN relates to your drawing. What are **Action A** and **Action B** representing respectively?

(Note for marker: the fan is a physical fan, buttons are physical/tangible buttons.)

Case (a) – (5 marks)



Case (b) – (5 marks)



Answer:

Case (a)	Case (b)
<p>3 marks for drawing</p> <p>Action A is pressing the LOW button, while the current button would release (2 mark)</p>	<p>3 marks for drawing</p> <p>Action B: Turn clockwise only (2 marks)</p>

Reasonable drawing/design can be awarded either full or partial marks, justify by how good student had explained.

Part C: Long Question (20 marks)

Answer ALL questions in this part.

Question 16

Extraction from an article: Chat GPT — Can This AI Chatbot Replace Human Jobs?

ChatGPT is best viewed as a tool that can improve human productivity. Dealing with routine and repetitive tasks can free up employees to focus on more complex and value-added activities.

Customer service and support: ChatGPT can significantly improve customer service experiences by providing immediate responses and handling basic inquiries. This may lead to better customer satisfaction but is unlikely to fully replace the need for human agents who can solve more complex problems and provide emotional intelligence.

Content Creation: When creating content, ChatGPT can be helpful, for example, in creating emails, creating reports, or even preparing marketing materials. However, it hardly replaces the creativity, nuanced understanding, and strategic judgment of human content producers.

Ethical considerations: Artificial intelligence like Chat GPT should be used responsibly and ethically. It is very important to ensure that people remain in the circle of critical decision-making, especially in sensitive areas such as health, law, and finance.

Reference: Sheetal (Oct 14, 2023). In Medium, URL=<https://medium.com/@sheetal20034/chat-gpt-can-this-ai-chatbot-replace-human-jobs-af1cee3cef3c> [Accessed: Nov 3, 2023]

- (a) After reading the provided article, present two arguments for how ChatGPT (GPT) could improve the productivity of human labor. (4 marks)
- (b) What is Pragmatics? (2 marks) Give one example to comment on whether GPT has an idea about pragmatics. (4 marks)
- (c) What is associative empiricist? (2 marks) And how does it relate to the design principle of feedback? (4 marks)
- (d) Hence, with the above information, justify whether GPT can replace a human student counsellor who take care about human's mental needs? (4 marks)

Answer:

(a) GPT

- is a kind of LLM (1 mark)
- It generates output by pretrained corpora of text with human feedback (2 marks)
- Which is one of the steps in the modern General NLP approach. (1 mark)

(b) Pragmatics

- Meaning with regard to the individuals involved and the context of the situation (2 marks)
- GPT has no idea about pragmatics (1 mark)
- As it only knows the dictionary meaning of words, but it does not understand conversational goals/needs. For example: as mentioned in lecture notes, GPT is confused with the word “depressed” actual context in the conversation. (3 marks)

(c) Associative empiricism (or associative empiricist) is (any two, 1 mark each)

- a mindset to solve problems with “having freedom”
- feel happy in open systems
- who make unstructured decisions
- they know they are doing something but they may not know what they are doing

Feedback is (1 mark)

- providing immediate responses and handling basic inquiries for users, such as alerts, pop-ups, error/warning messages, etc. (1 mark)

Relationship of feedback to associative empiricist (3 marks)

- When a user is using a UI, they may like to navigate (1 mark)
- but sometimes they may get lost e.g. don't know where they are, don't what they are doing, or doing correctly or wrongly (1 mark)
- Feedback can provide guide/information when a user get lost (1 mark)

(d) GPT

- Cannot replace a human student counselor (1 mark)
- A student with mental needs may need someone to understand (1 mark)
- GPT can reply with standard assumptions but does not understand the underlying meaning of human conversation (no knowledge) (1 mark)
- The feedback and response are not useful because GPT has no goal in conversation, which a goal (to thrive and recognize their strengths, as

well as improve their interpersonal relationships/to resolve one's problem, etc.) is important in counseling. (1 mark)

End of Mid-term Test Solutions