

Student Number:

Seat Number:

Faculty of Computer Science

Course:	Human Factors and Human-Machine Interaction	Semester:	SS 23
Programme:	Artificial Intelligence, B.Sc.	Duration:	90 min.
Examiner:	Alexander Frummet, M.Sc.	Date:	21.07.2023
Hilfsmittel:	None	Time:	11:00
Exam Type:	written exam: 90 Min.	Number of sheets:	13

Please read carefully!

- Verify that your **answer sheet** is complete.
- Write your **seat number** on each page.
- Read all exercises and get an overview of their scope.
- Do not write outside the **designated margin**.
- Write **slowly and legibly**. Do not sacrifice readability to save a few seconds.
- The **maximum** achievable points indicated are **preliminary**. Current total: 90
- For some of the questions, there is **a maximum word/sentence limit** for your answer. Your responses should not exceed this limit. Please take this restriction seriously! I reserve the right to shorten your answers to the specified word/sentence count if necessary.

Good luck!

Alexander Frummet

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DESIGN OF EVERYDAY THINGS (29 POINTS)

a) Name the two cognitive systems we have learned about. Also, provide one property of each system. (4 points)

1. _____

2. _____

b) Name the fundamental components of Jens Rasmussen's SRK taxonomy. (3 points)

S: _____

R: _____

K: _____

c) Your friend, an experienced piano player with over 10 years of experience, is playing a familiar song. Which cognitive system is she utilizing, and which level of the SRK taxonomy is impacted? Please provide the name of the cognitive system and the corresponding level on the SRK taxonomy. Additionally, include a statement explaining your selection in **1-2 sentences**. (4 points)

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d) Provide the names of two interaction principles that support discoverability and two that support understanding. (4 points)

Discoverability: _____

Understanding: _____

e) In the following, name the interaction problems or violated interaction concepts with their specifically appropriate technical terms. (6 points)

- You want to submit a research paper online. After uploading the document, you click the submit button. However, you do not receive any confirmation message indicating that your submission has been received.

- To increase the volume on your stereo system, you need to rotate a physical knob in a *counterclockwise* direction.

- You visit your grandparents to share some beautiful vacation pictures from your smartphone. Unfortunately, they encounter difficulty navigating between photos as there are no visual arrows indicating the direction of the swipe gesture.

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- The burners of your gas stove are arranged in a square pattern, while the control knobs are arranged in a linear fashion. You want to turn on the top right burner, but you are uncertain which control knob corresponds to it.

- In Germany, distances on highways are measured in kilometers, whereas in the United States, miles are used for the same purpose.

- A young person is using a word processing application for the first time. However, he/she is unaware that the "Save" button is represented by an icon resembling a floppy disk because he/she is unfamiliar with what a floppy disk is.

f) Provide the names of two interaction principles that assist in bridging the Gulf of Execution, and two interaction principles that assist in bridging the Gulf of Evaluation. (4 points)

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g) We have studied Don Norman's "Seven Stages of Action." For the following interactions, identify the stage at which they fail and provide the name of that stage. (4 points)

- You want to buy tickets for a concert. Upon entering your credit card number and clicking the "Pay" button, you do not receive a notification confirming the success of the payment.

- After clicking the login button, you receive a notification written in a language that is unfamiliar to you.

- You find yourself in front of an elegant new door that lacks any visible door handles. You know there must be a method to open it, but you don't know how.

- A 3-year-old child is too weak to open a bottle of water.

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COGNITIVE BASICS (28 POINTS)

a) What are preattentive cues, and how can they be utilized? Explain in **two sentences**. (3 points)

b) While engaged in a phone conversation with your partner on your way home from work, you fail to notice two friends who cross your path. What is the reason for not noticing them, and what is the name given to this phenomenon? Please provide your answers in two sentences. (3 points)

c) To perceive our environment, our eyes are constantly moving. How do we call the „jumps“ between fixations? (1 point)

d) Name three visual features from the first stage of visual perception. (3 points)

1. _____

2. _____

3. _____

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e) You have been provided with 9 circles. Utilize the Law of Proximity to create three groups. Draw it here: (3 points)

f) You have been provided with 3 circles, 3 squares, and 3 triangles. Utilize the Law of Similarity to create three groups. Draw it here: (3 points)


g) What does C.R.A.P. stand for? (4 points)

C: _____

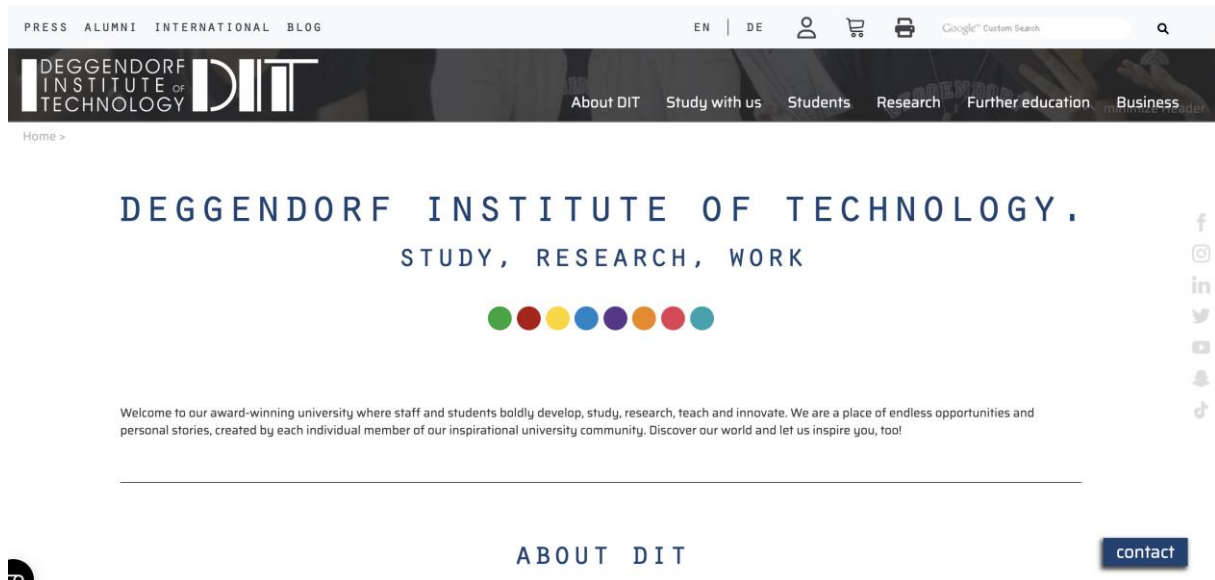
R: _____

A: _____

P: _____

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h) Which C.R.A.P. principles can you identify in the given screenshot? Provide an example for each principle. (4 points)



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- i) What is the SEEV model? Name the key components. (4 points)

S: _____

E: _____

E: _____

V: _____

INFORMATION VISUALISATION AND INFORMATION DASHBOARDS (12 POINTS)

- a) Imagine, your task is to design a student dashboard for the Deggendorf Institute of Technology (DIT). How can the SEEV model be employed in the dashboard design process? Elaborate with examples in **3-4 sentences**. (4 points)

- b) Name two main properties of an information dashboard. (2 points)

1. _____

2. _____

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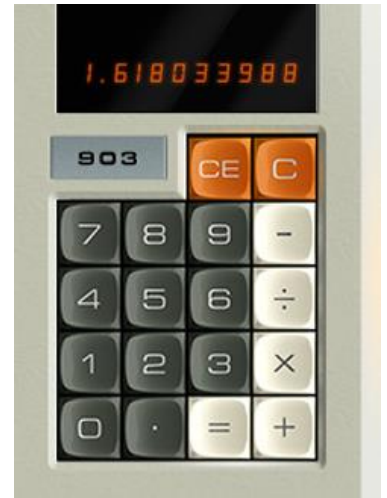
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c) Examine the provided screenshot of a calculator app. Identify and name the design principle or approach that is evident in the visual representation. Please provide your answer in **one word**. (1 point)

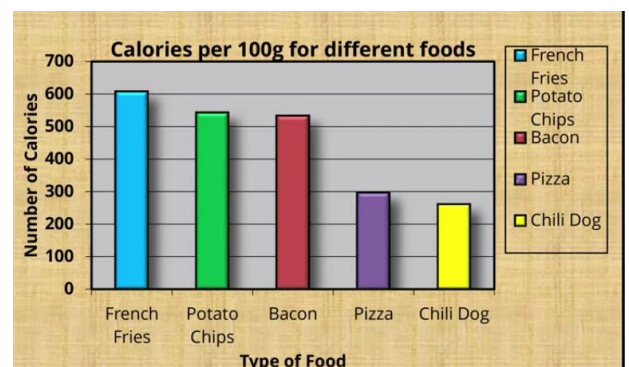


d) What are the three important aspects of situational awareness? (3 points)

1. _____
2. _____
3. _____

e) Name two ways to improve the data-ink ratio in the following graph: (2 points)

1. _____
2. _____



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USABILITY ENGINEERING (21 POINTS)

a) What are the **three** evaluation dimensions of usability according to the definition? (3 points)

1. _____

2. _____

3. _____

b) The usability process can be broadly categorized into three stages: Analysis, Design, and Evaluation. Identify and name **one usability method** for each of these stages. (3 points)

Analysis: _____

Design: _____

Evaluation: _____

c) We have studied the seven principles of dialogue design. Provide the names of **three** of these principles. (3 points)

1. _____

2. _____

3. _____

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d) Elaborate on one of these principles in greater detail and provide a real-world example where this dialogue principle is implemented (**3-4 sentences**). (4 points)

e) What is the main difference between Usability Inspection and Usability Tests?
[< 10 words] (4 points)

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f) You are in the process of developing a fitness app aimed at tracking gym progress. After several interface iterations, you wish to assess its usability using a questionnaire. While seeking to evaluate overall user satisfaction, you also want to gauge system quality (usefulness), information quality, and interface quality. Which questionnaire would be the most appropriate choice? Please justify your selection in **two to three sentences**. (4 points)