Faculty of Social Sciences   Name:

Academic year 2020-2021   First Name:

June 2021   Student number:

                                                      Programme:

Online Open Book Exam

Professor B. Zaman

Course Human-Computer Interaction B-KUL-S0C76A

Exam-specific instructions:

- The exam lasts for 2 hours.

- This exam contains two questions. The last question consists of two sub-questions.

- As it is an open book exam, it is important that your answers are paraphrased in your own words as much as possible. Where possible and relevant, try to connect various parts of the course material. As the space for your answer is limited, it is important to distinguish main from side issues.

- Formatting: Please use font size 11 or 12. Do not change the margins or any other spacing options.

- Exams will be checked for plagiarism using the Turnitin tool.

- References:

  o If you are referring to the texts of the <u>slides</u> (incl. notes) or the <u>videos</u>, it is <u>not</u> necessary to include references. Of course we expect you to <u>paraphrase</u> these ideas in your own words, and not simply copy them.

  o If you are basing your ideas on a text in the <u>reader</u>, then <u>yes</u> please use <u>in-line references</u>. For more information on in-line references in APA, please see: <u>https://owl.purdue.edu/owl/research_and_citation/apa_style/apa_formatting_and_style_guide/in_text_citations_author_authors.html</u> . It is allowed to rely on another scientific reference style than APA, as long as you use it consistently. It is, however, <u>not</u> necessary to add a <u>reference list</u> at the end of your answer for those reference that link to the reader.

  o If you include a <u>new source</u>, one that was not included in the exam material and that is not included in the exam question, then please use both an in-line reference and the full reference at the end of your answer in a separate reference list. You can rely on APA or another scientific reference style, provided you use it consistently.

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Question 1. Donald Norman (1988) explains the importance of a good conceptual model using the example of a two-compartment refrigerator. Explain in your own words what the problem was, and make sure you refer explicitly to the following concepts: "conceptual model", "visibility of the system" and "feedback". It is not necessary to go into the technical specifics.
(Answer max. 1 page, 10 points)

Question 2. In May 2021, at the online CHI conference, which is widely considered the most prestigious conference in the field of Human-Computer Interaction, Liu et al. presented their research paper entitled "Significant Otter: Understanding the Role of Biosignals in Communication". You can find the full paper in the xToledo exam folder or on https://dl.acm.org/doi/pdf/10.1145/3411764.3445200 . For these exam questions, it is sufficient that you read the abstract and the brief summary of the paper provided below, and have a look at Figure 1, Figure 3, Figure 4 and Figure 5. We do not expect you to have read the whole paper.

Summary Liu et al. 2021:

In this paper, the authors discuss a new wearable application that senses biosignals, such as heart rate, and that processes these biosignals as signs of physical and emotional responses. The application deploys the 'Significant Otter', an Apple Watch and iPhone app "that enables romantic couples to send heart rate-driven animations as messages to each other. Signifcant Otter intelligently suggests animations that match their current emotional and physical state." (p. 2) Thus, it is an AI-mediated app that suggests avatars based on a match with people's current emotional and physical state in order to promote communication and connection between romantic partners.

How does it work? Users must give permission first that the watch and app can access and sense their heart rate as well as capture motion-based activities. The app collects all these data and then suggests several animations that seem to match the emotional and physical state of the users. To initiate communication, the app gives suggestions for four types of state animations. You see examples of these state animations in Figure 3. Two of the four state animations are recommendations that the system automatically preselects based on sensing data, namely emotions (e.g., excited, angry, calm, sad, surprised, bored, neutral), and daily activities (e.g., sleeping, eating, walking, exercising). The other two states are fully determined by the user. Users

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who wish to start a communication can then view these suggestions of otter animations on their watch or phone, scroll through the list, make a final choice, and send one to their partner. Once the communication has initiated, the app also presents a list of possible reacts, but none of these reacts are sensed. Examples of react animations are shown in Figure 4 and Figure 5. Users can simply tap on the otter to send it to their partner.

Results: The authors ran an experiment to evaluate their design, that is the app based on sensing data (*sensing ON, with biosignals*) and compare it to a control condition of an app that does not rely on sensed biosignals (*sensing OFF, without biosignals*). In general, the study showed that participants viewed both versions as efficient to send quick messages. However, some participants were frustrated with the limited options, expecting a wider and more expressive variety of expressive messages and/or were sceptical of the system's ability to sense states and disagreed with the suggestions the app presented. As for the comparison of the app with or without the sensing feature, the app without the sensing feature (*sensing OFF*) was perceived as sending more ambiguous messages, inviting the users themselves to assign meaning, including meanings that were not originally designed for. When the sensing was off, some users engaged in verbal follow-up conversations to clarify the animations they sent. This ambiguity was not present in the version with sensed animations (*sensing ON*), as "participants understood them [i.e., the otter animations based on sensed data] as simply representations of their own or their partner's current state" (p10). Furthermore, people felt that "sensing ON enabled a more personal experience with each other because it was backed by data" and that they felt "more connected to both their own and their partner's otter because they were tied to their bodies' physical states, as if they were the otters themselves" (p. 10).

In what follows, we will ask two questions related to the course material associated with this study.

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Question 2.1. Based on the information in the summary presented above, where would you place this app on the spectrum ranging from a cognitive, rather first wave approach to emotions on the one hand to a more situated, interactional and rather second and third wave approach to emotions on the other? Place a cross on the scale below and motivate your answer. Make sure your explanation is sufficiently focused on the example of the study as presented above. (Answer 1 page - max. 1,5 page; 20 points)

←---X----------------------→
Cognitive approach to emotions   situated interactional approach

Question 2.2. Apply Marc Hassenzahl's (2003) framework to this case study to make sense of the design qualities of this app and how it can be categorized as a product. It is not necessary to discuss the usage modes. (Answer 1 page - max. 1,5 page; 20 points)