Human-computer interaction – examination

Course Code: TDA286, TDA460, INL040
Date: 05-10-17
Time: 8.30-12.30
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Please answer in English or Swedish

The examination can give a maximum of 100 points.
You need at least 50 points to pass the examination (G).
Max points per question are indicated after each question.

Please give brief/short answer to the questions and follow by motivation for your answer if appropriate.

Examination review (tenta granskning): Nov. 2, kl 9-12, at Edit-hus, room 6103 A
1. **Human cognition**
   In the ‘70s and ‘80s, cognitive psychologists were interested in studying the cognition that happens in individual’s brain. Human information processing theory was developed during that time.
   a. Give a short description (with drawing) about this theory (4p)
   b. What is short term-memory? What is long term-memory? (2p)
   c. What is attention? (2p)
   d. What kind of factors can affect perception? (2p)

2. **Usability concept**
   a. Give a short statement of the ISO standard for usability (1p)
   b. How can we measure it? (1p)
   c. Give a short explanation about (6p):
      - Learnability
      - Flexibility
      - Robustness
   d. Different products have different usability requirements? Give at least 2 examples (2p)

3. **Usability evaluation methods**
   a. People use different methods to evaluate the usability of a product or an interface. Provide 3 methods that are normally used on user tests, and 3 methods applied by cognitive experts (4p)
   b. It is recommended that one should apply both user tests and expert methods simultaneously, why? (2p)
   c. Give a short description of user test process. How many users would you recommend for such test, why? (4p)

4. **Interaction design basics**
   a. Explain the differences between design guidelines, standards and principles. Provide one example for each of them (4p)
   b. Why do we need to have design theories? Give a short description of 3 design theories that you have learned so far (6p)

5. **Design process**
   a. Give a short description of the iterative design process. (3p)
   b. At which design stage(s), the designers should carry out the usability tests? (2p)
c. Scenarios have been regarded as very useful tools for design, why? (3p)
d. Social impact is analysis in the early design. Please list at least 4 factors that such analysis will normally concern (2p)

6. Research methodologies
a. To have a better understanding of human cognition and human interaction, many research works are carried out in the laboratory. People often use the terms: hypothesis, independent variables, dependent variables, within-subject design and between-subject design. Give a short description of each term. (5p)

7. Task analysis
a. Do an HTA analysis of the scenario (5p):
   Call your friend from your mobile cellular phone.
   You have your friend’s phone number in the phone’s address book.
   (Of course the actual actions will be different for different phones, but at this moment you do not need to consider that)
b. Now, translate the HTA into a GOMS analysis. What different insight into the task does this give you? (5p)

8. Multimodal interaction
a. What is universal design? What are the design principles? (3p)
b. What is multimodal interaction design? (2p)
c. Why is speech technology such an important part of multimodal interaction? (2p)

9. Social-organizational issue
a. What is a stakeholder? (1p)
b. Give the categories of the stakeholders (2p)
c. Why is an analysis of stakeholders important for the usability design (1p)
d. When people try to introduce a new technology to an organization, it is necessary to evaluate if it is suitable or not. How to carryout such evaluation? Why is it so difficult? (4p)

10. What are the Grudin’s eight challengers for CSCW (computer supported collaborative work)? (4p)

11. Ubiquitous computing
a. What does ubiquitous computing mean? (1p)
b. There are three application themes people are often used, which are they? (2p)
c. What does augmented reality mean? (1p)
12. **Design a machine**

Now, as you have enough knowledge on usability design, you are asked to take the responsibility of designing a machine. This machine can be worked as printer and scanner. It can also be used as a fax and copy machine. It can be installed at home, or in small offices.

How will you do to enhance the usability issue in such product? Please make up a project plan of what kind of process you need to take place, who shall be your design team members, and what kind of design and evaluation methods you are planning to apply. (12p)