Human Computer Interaction

December 23rd, 2011

The exam text is in English. You can answer the questions in either English or Dutch. In either language and for all answers you should be **concise**! Mark the answer with the question number and use a new page for each of the answers. Clarity in the arrangement of the answers is much appreciated as it greatly helps correction of the exam. **At completion of your exam, hand in the question sheet together with your answer sheets.** The exam starts at 10.00 hrs. and ends at 13.00 hrs. Success!

Question 1 (30 points)

Answer the following fifteen statements by first stating whether it is correct or incorrect and then followed by a ONE-sentence motivation of the answer.

a) The interaction model of Abowd & Beale is a reduced version of the 7 stages model of Norman.
b) The Hawthorne Effect explains bias in user evaluations as a result of bringing users in a test environment.
c) The PACT system is a compact strategy for defining and analyzing interaction.
d) The Model Human Processor is a simple model to be able making predictions in cognitive aspects of HCI.
e) A touch-point is an interactive locus in service design.
f) CMYK is a subtractive color model that is used to define colors on a screen.
g) Humans can deal with multiple loci of attention in a GUI; this should be taken into account in design.
h) Constructivists state that all vision is acquired through learning and that is why it relates well with the theory of Gestalt.
i) A mental model helps in predicting the behavior of a machine.
j) Bringing the concept model as close as possible to the user model is considered good practice in design of interfaces.
k) Fitt's law is used to understand the efficiency of a pointing action to objects on a screen.
l) Event based programs are underlying GUI interactive programs by means of events.
m) An earcon is an audio message represented by an icon.
n) In design artifacts are used to simulate the completed design.
o) Visibility is giving information on how a function in the interface is perceived by the user.

Question 2 (25 points)

One of the key concepts in HCI is usability. In total we distinguish five (5) different major concepts in HCI.

a) Explain the other for major HCI concepts.

Usability is important in the evaluation of the user interface and user interaction. To that end, usability is incorporated in an ISO standard (#9216) on software metric and evaluation and it has its own definition captured in an ISO standard (#9241). To understand usability 4 components are described.

b) List and explain these 4 components.

Usability is part of the design trajectory of interactive products and therefore next to functional specifications, usability specifications are formulated.

c) In what part of the design trajectory are these specifications formulated and why.
d) Explain the purpose of the usability specifications in the context of the design process.

The usability aspects need to be assessed in the trajectory of design and so a palette of evaluation techniques is used.

e) What is the specific purpose of evaluation; give the 4 characteristics.

Question 3 (15 points)

User interaction is considered to be task oriented. Different kinds of Task analysis are used in the design of software; for the design of interactive software systems task analysis is an important tool. One class of task analysis methods is the cognitive task analysis

a) Explain the main goal of cognitive task analysis and discuss three (3) methods for cognitive task analysis.

Another class of task analysis is that of hierarchical task analysis.

b) Explain how this class differs from the cognitive task analysis; what are the two major techniques that are applied for hierarchical task analysis?

Task allocation is a concept that is used in the hierarchical task analysis

c) Explain the concept of task allocation in the context of task analysis. How is it applied?

Question 4 (30 points)

Recently (CES 2011), a new product was launched on the market: the Aroma Programmable Generator (APG). This device releases scent in a controlled and programmable manner. This device addresses the olfactory system and is used to enhance experiences of digital media, such as email, film and games. It is connected to a computer via USB and cartridges with different scents are available. As it will enhance the experience of digital media, a company involved in developing products for the "second life" virtual social community is considering producing scent cartridges and selling them to the "second life" residents so as to add another dimension in their communication.

A student in HCI is asked to participate in a design team and starts with an assignment to analyze this new application of the APG. First, it need be established what stakeholders to this new product are.

a) Explain the concept of stakeholders and rank the stakeholders for this project.

In order to understand the potential use of the product an analysis of users is made. From previous experiences the HCI student knows that the use of scenarios and persona's can be helpful.

b) Explain the concepts of scenario and persona in the context of designing interactive products.

In discussions with cognitive psychologists the design learns that the APG can be used to help users in "second life" overcome nervousness by connecting the experience with a scent the user can associate with pleasant thoughts. In this manner a behavioral change in using "second life" can be triggered. The HCI student explains the team such approach is known as Captology.

c) Explain what Captology is and why this interface can be classified as such.

The company requests the student to further develop this olfactory interface. To that end the student formulates usability specifications.

d) What are the ingredients of a usability specification?
e) Write out an example of a usability specification for this particular new product development.

In working out the design path for this product, specific interactive software needs to be written. In order to assess the progress of the development evaluations are planned. The student now realizes that the situation is quite complex as users exist in the virtual world as well as in the real world. This requires a special approach, maybe …

f) Write a plan for an evaluation strategy throughout the design trajectory. Carefully motivate each step of the plan.