Human Computer Interaction
December 19th, 2007

The exam text is in English. You should answer the questions either in English or in 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) Schemata are over-simplified scenarios.
b) In a usability test the planned target level is to define to state-of-the-art upper limit.
c) The Stroop Effect is a typical illustration of interference with cognitive processing.
d) CMIK refers to a subtractive color model for defining screen colors.
e) The focus of multimodal user interfaces is on simultaneous use of channels.
f) An interface based on recall will work better than one based on recognition.
g) Consistency in color application is sometimes obstructed by cultural conventions.
h) In Incremental Prototyping the next prototype is an improved version of the current.
i) Groupware is a class of user interfaces based on communication tools.
j) The room-building concept is today still applied in modern windowing applications.
k) The cocktail party phenomenon refers to getting attention of a waiter in a noisy crowd.
l) Captology is the major concept in pervasive computing.
m) Fitt's law can be applied in usability studies.
n) In Norman's interaction model the gulf of execution tells something about user expectation of system state and the change in system state.
o) According to Gestalt past experiences affect individual perception.

Question 2 (25 points)
In User-Centered design the usability the product is one of the three essential ingredients.
a) Name the other two essential ingredients of User Centered design.

In the design process the usability specifications are set and evaluation is used to obtain information about the usability of a design. It may be applied at several occasions in the design process.
b) Name the three (3) goals of evaluation.

The stage of the design process in some way dictates the choice of the evaluation method. Let us simplify the design process in three stages: System design, Interaction design and Prototype design.
c) Select an appropriate evaluation method for each of these three stages and motivate your choice. Your motivation should be based on a selection of comparable criteria that you use in assessing the different methods. Therefore the first part of your answer should be your selection of criteria.

Evaluation is sometimes used in an incorrect manner so that the outcome can not be used beyond doubt.
d) Describe (at least 3) some of the malpractices in evaluation.
e) Usability and usability testing are underlying concepts of evaluation. Name the 4 major components of Usability for a system.

Question 3 (15 points)
In HCI we know the Desktop, with variations in different operating systems and find it included in daily computer practice. The Desktop is often referred to as a composite metaphor.
a) What is a metaphor and how is it used in the context of HCI.
b) What is the relation of the mental model with the metaphor? Motivate your answer.
c) What is meant with a composite metaphor?

Question 4 (30 points)

In this assignment you are presented a case study for which you develop a satisfying solution using HCI practices. Carefully read the complete question before answering!

The so-called BodyPad is manufactured for gaming; and in particular games that involve lots of fighting. Using the BodyPad, the interactivity with the game increases significantly. A manufacturer plans to use the BodyPad to introduce a new service for instructional purposes. The company is elaborating an idea for keep-fit exercises for the young mother (to be) for pre- and post pregnancy exercises. Their Product will be marketed as the BodyFitPad. All the controls and features are used in a dedicated training. The BodyFitPad and the keep-fit instructions will be sold with a Playstation. A high quality DVD is used to give instructions to the user. The keep-fit exercises are "played" in a virtual world in which the user has do pick up things and do workouts. A memory module can keep track of the exercise level and progress the user is making with the exercises. The company intends to involve the community of gynecology-midwife & pregnancy fitness instructors in the development. In this manner the company hopes for a good propagation of their product in this market.	

BodyPad features*: two arm/leg sensors with elastic bands, two handles with elastic bands, a belt module with 4 cables, radio-frequency receiver box connectable to Playstation consoles, three 1,5 Volts batteries. Ergonomic shape of the sensors allowing them to generate their on/off signal even when away from their first position. Multi-signal light on the receiver box to check the quality of the radio signal.*

   a) Write a *scenario* including 2 *personas* for the suggested of use the BodyFitPad. This scenario is used in this assignment as bases for an application that you further elaborate.
   b) Name the stakeholders for this particular application.
   c) In what manner are scenarios, personas and stakeholders important in HCI?
   d) Sketch a **two-screen** paper design of the easy-to-use interface for your BodyFitPad application based on the scenario given in answer (a).
   e) What interaction style(s) are used in your BodyFitPad application?

To further formalize your application and in support of the prototyping and implementation you have to decompose the tasks that you wish to address in your BodyFitPad application.

   f) List the 4 principal questions of task decomposition.
   g) Draw a hierarchical task diagram of the major tasks in your application.

At some point in the design trajectory a usability study of your BodyFitPad application with the intended users is performed.

   h) Write and motivate a specification for a usability study including levels and time dimensions.