Exercise sheet 7 – Mensch-Maschine-Interaktion 2

Time frame: 1.5 week
Group size: individual submission
Tipp: This assignment is for one and a half weeks. If you start working in the second week, it might feel like there is too much to do. If you start early, the time frame should be fine!
Note: Exercise 1 is one of the „harder" exam questions. Those students, who want to get a good grade, might also need to solve tasks like exercise 1. Don't worry; you will pass the exam if you can answer the „simpler" questions.

For this assignment you receive a maximum of 20 points. If you reached at least 15 points you get <u>two</u> bonus points. Bonus points will be added to the points achieved in the final exam.

Submission

Please Submit a pdf document with the solution until 3.02.2014 15:00 in UniWorx.

Exercise 1: Fitts' law (5 points)

Maraike and Sarah want to compare how long it takes to start an application on their respective moile phones. Maraike has an iPhone and Sarah has an HTC smartphone running Windows Mobile.

Hint: use Fitt's law parameters a=0ms and b=100ms.

(a) The size of the iPhone application icon is about 9 mm. Maraike's index finger rests at a distance of 1,35 cm from the squared icon of the application she wants to start. Predict the time it takes Maraike to hit the icon of the application she wants to start. (1 point)
(b) Discuss how the predicted time could change when Maraike would take a Stylus? Which Fitts' parameters change? Estimate how (higher/lower) and explain your decision. Which technical requirement does this Stylus need to work with the capacitive iPhone screen? Explain your answer. (2 points)
(c) Sarah places her phone on a tabletop too. Her index finger rests at the same distance (1,35 cm) from the squared application icon of 1mm. Is Fitts' law still a good fit? If not, present a formula from the lecture that is a good fit for this situation and explain the parameters. (1 point)
(d) Detect one major error that makes their comparison not valid. Explain your answer. (1 point)

Exercise 2: Small Screen (2 points)

(a) Name two techniques to visualize off-screen targets. From which human abilities do they take advantage of? (1 point)
(b) What are the advantages of a back-of-device interaction? Describe one interaction scenario where back-of-device interaction helps? Explain your answer. (1 point)

Exercise 3: Sensing interaction (3 points)

   (a) Name four sensors that we could use to detect device movements. Explain also what
       types of movements they detect and what their limitations are. (2 points)
   (b) What does an accelerometer measure? How can it be used to measure device tilt
       movements? (1 point)

Exercise 4: Social aspects and context (3 points)

   (a) Why became privacy an increasing issue with mobile phones (compared to traditional
       desktop computers)? (1 point)
   (b) You are standing in the subway. Your phone uses unlock patterns. Name 2 types of
       attacks that someone else in the Metro could use to violate your privacy. (1 point)
   (c) Name two examples of how mobile devices can build up and strengthen social
       environments. Mention also what this is good for. (1 point)

Exercise 5: Read and reflect on a research paper (7 points)

Read the following paper:

Sebastian Boring et al.: „The Fat Thumb: Using the Thumb's Contact Size for Single-Handed
Mobile Interaction", Mobile HCI 2012
(http://www.sebastianboring.com/content/publications/prints/boring.MobileHCI-
2012.fatthumb.pdf)

Formulate in a clear way and in your **own words**...

   (a) (1 point) what is the problem that this research paper addresses? Answer in the format
       of <Problem Name>: <Problem Description>
   (b) (1 point) which other techniques did we discuss that address this problem?
   (c) (1 point) what do they propose as a solution/approach to solve the problem? How did
       they implement it? What is the limitation of their approach?
   (d) (1 point) what other research systems have explored touch pressure or contact shape as
       additional input dimension?
   (e) (1 point) how did they apply their technique to pan & zoom navigation?
   (f) (1 point) think about an interaction scenario on your phone where the fat thumb
       technique could be useful.
   (g) (1 point) what this paper found out in their experiment.