Exam in Ubiquitous Computing 7.5 ECTS (5DV024)

Date: Thursday June 13th 2013
Writing time period: 9:00 - 13:00 hours
Location: ÖP 7
Number of questions: 16
Total number of points: 24

The teacher can be contacted on his mobile (0705417846) between 10:00 a.m and 11:00 a.m.

Instructions

• Your answers to the exam questions should be written in English language.
• Write your name and personal number only on the first sheet where you also provide your signature. Subsequent answer sheets should not include your name or your other identities.
• In all the sheets, write you code. Leave Q Points and Total Points so far empty.
• Answers to the questions should be written in the space provided below the questions. If the space is not sufficient then use additional papers and attach them at the end of this booklet. Do not forget to include the question number in the additional booklet.
• Do not write one-sentence answers (unless it is specified in the question to do so) as you are expected to expand your answer and discuss it based on your understanding of the subject. One suggestion to know the expected length of your answers is to fill up at least half of the space below each question.
• Do not write too much either even though you could have additional papers. 2 point questions should have a maximum length of 3 pages and 1 point questions should have a maximum length of 1.5 pages.
• If you think a question is unclear, decide for an interpretation and answer the question according to your interpretation. Describe all interpretations made. Some questions are vague with the sole purpose of making you think and discuss from the interpretations that you make.
• Write very clearly. Every unclear sentence will be interpreted to your disadvantage.
• Motivate your answers to all questions. If possible provide examples and diagrams to present your answers with better clarity.
• Be creative in answering some of the questions.

Good luck! Dipak

Code: Total Points: /24 Exam Grade:
Ubiquitous / Pervasive Computing

Q1. How is minimum client thickness determined in ubiquitous computing? Explain briefly with an example.

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(1 point)
Ubiquitous / Pervasive Computing

Q2. Mention and describe any two promising interaction technologies that will affect ubiquitous computing environments. 

------------------ (2 points)
Code: Q2 Points: Total Points so far:
Context-Aware Computing

Q3. What are the features of context-aware applications? Explain them with reference to a “cooking assistant application” in a smart kitchen.

------------------ (2 points)
Code: Q3 Points: Total Points so far:
Smart Objects and Environments

Q4. What are smart objects? Mention the three types of smart objects discussed during the lecture.

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(1 point)
Tangible User Interfaces

Q5. What is the difference between “In-Band” and “Out-of-Band” Interaction? Describe the role of Tokens and Constraints in making it difficult or easy to distinguish between “In-Band” and “Out-of-Band” Interaction with an example. 

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(2 points)
| Code: | Q5 Points: | Total Points so far: |
Activity Based Computing

Q6. Mention and describe any two principles of Activity Based Computing according to Jacob Bardram.

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(1 point)
Activity Based Computing

Q7. How will you recognize the following activities?
   a) Picking blueberry in a forest
   b) Arrested by cops for a car accident (negative scenario)
   c) Preparing dinner together with a friend

Describe your approach in terms of the technology (sensors) that will be used and the computing techniques for activity recognition. Discuss why your approach is better in terms of recognition accuracy and cost compared to alternative technologies.

-------------- (3 points)
Code: Q7 Points: Total Points so far:
Graspable / Tangible User Interfaces

Q8. Discuss about any 4 advantages of tokens and constraints with necessary examples.

---------- (2 points)

Code: Q8 Points: Total Points so far:
Code: Q8 Points: Total Points so far:
Proxemic Interaction / Egocentric Interaction

Q9. Compare proxemic interaction with egocentric interaction in terms of proximity.

--------- (1 point)
Location Aware Systems

Q10. Describe the 3 approaches to automatic location sensing with necessary examples.

---------- (2 point)
Code:  Q10 Points:  Total Points so far:
Wearable Computing

Q11. Draw a figure with the common parts of a wearable computer. 

-------- (1 point)
Wearable Computing

Q12. Describe Licklider’s vision of Man-Computer Symbiosis in your own words?

---------- (1 point)
Augmented/Mixed Reality

Q13. How is augmented/mixed reality used in the entertainment industry? What benefits does it bring?

---------- (1 point)
Q14. Why do activity recognition systems have a training phase?

---------- (1 point)
Evaluation Techniques

Q15. Why are the conceptual models an important evaluation factor for ubiquitous computing in comparison to desktop computing? Discuss briefly. 

--------- (1 point)
Ubiquitous Computing Applications

Q16. Describe the role of data mules in vineyard computing. Also, discuss the role of ethnographical studies in coming up to the concept of data mules.

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