



Department of Computer Science

Dr. Daniel Sonntag
Takumi Toyama (Msc.)
Markus Weber (Msc.)
Indra Praveen Sandrala (Msc.)

Exercise Sheets 2 and 3

Intelligent User Interfaces: Design and Implementation (course 89-7159)

Fall Semester 2014/2015

Exercise 1-4 can be answered by reading Chapter 3 (Cognitive Aspects) of the course book Interaction Design.

Exercise 1: (1 + 2 = 3 points)

Answer the following questions:

1. What does Miller's 7 +/-2 mean?
2. Which impact does it have for you as user interface / interaction designer?

Exercise 2: (2 + 4 = 6 points)

We have learned that "recognition is better than recalling". Provide an example for recognition and one for recalling. Name four implications for the design process of a product or system.

Exercise 3: (4 points)

What is the advantage when people understand the mental model a system uses?

Exercise 4: (3 + 3 = 6 points)

Explain the following concepts and provide one example for each concept (do not use examples from the book or the lecture):

1. Externalising to reduce memory load
2. Computational offloading

Exercise 5: (3 points)

Explain the term "Binocular View".

Exercise 6: (4 points)

Develop a PEAS description of the task environment (including environment characteristics) for two intelligent user interface agents, e.g., Robot soccer player, Eliza, or Automatic Internet book-shopping (with Siri).

Exercise 7: (2 + 4 = 6 points)

Explain the differences between forward and backward chaining production rules. Explain two IUI situations where forward chaining or backward chaining is an advantage, respectively.

Exercise 8: (4 + 4 points)

1. What are the main features of cognitive architectures? Which role do modular plausible cognitive architectures for language processing have to play?

Due to Friday, December 5, 2014 (before recitation at 10am)

2. What is the difference between the two cognitive architectures Soar and ACT-R? Give two examples where the differences are relevant to the intelligent behaviour of an AI system, e.g., what are the consequences that Soar allows for “open decisions” and ACT-R does not.

Exercise 9: (4 points)

What are the advantages when people understand the mental model a system uses. What could a cognitive system know about the mental model of a specific user? And how could this knowledge be turned into an improved intelligent interaction between the system and the user?

Exercise 10: (8 bonus points)

1. Watch the following four videos about vision-based augmented reality systems:

- <http://www.youtube.com/watch?v=5rtxz1P2Ogw> (Airscouter)
- <http://business-glasses.com/> (Itizzimo)
- http://av.dfki.de/projects_recent/ar-handbook (DFKI)
- <http://www.dfki.de/RadSpeech/ERmed-CHI2013video.wmv> (DFKI)

Explain the commonalities and differences by using the IUI classification system: attention, perception, memory, learning, reasoning.

2. Come up with a creative way to make each of these workspaces more intelligent. Include and describe a new intelligent aspect of the solutions.