

## Exam - Integrative Modelling

(Tuesday, October 20, 2015, 8.45-11.30)

This exam consists of 20 questions (10 open questions and 10 closed questions). For each question, you can obtain a maximum of 10 points in case of a correct answer. Your final grade will be determined by dividing the sum of all points obtained by 20. You can give your answers either in English or in Dutch.

### Open questions:

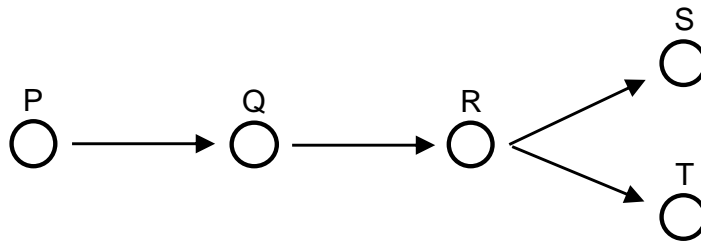
1. Explain by means of an example what is the difference between a 'domain model' and an application. (10 points for a correct explanation)

2. Consider the following text:

"Paro is a robot seal, used for therapeutic purposes. By moving a switch on Paro's back to the left or the right, she can be set to two modes, namely a happy and a sad mode, respectively. In the happy mode, Paro produces a loud sound when touched by the user. In the sad mode, Paro produces a soft sound when touched by the user. Moreover, in the happy mode, Paro can react to voices: when hearing a human voice, she moves her tail and blinks her eyes."

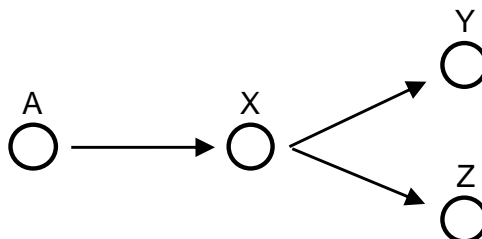
List all input states, internal states and output states that are described in this text. (10 points maximum; -2 points per incorrect or missing concept)

3. Give the definition of an agent. Also, give an example of an agent and explain why this example satisfies the definition. (5 points for a correct definition; 5 points for a correct example with explanation)
4. Consider the following picture of a domain model. Assume that  $S$  can be observed by the agent, and that the agent desires not( $Q$ ). Draw the corresponding analysis model. (8 points maximum; -2 points per incorrect circle or arrow)



Did you use forward or backward reasoning? (2 points)

5. Consider the following picture of a domain model. Assume that the agent desires  $Y$ , and that  $A$  is a possible support action. Draw the corresponding support model that makes use of forward reasoning. (10 points maximum; -2 points per incorrect circle or arrow)



6. Answer question 5 again, but this time using backward reasoning. (10 points maximum; -2 points per incorrect circle or arrow)
7. Mention 4 properties of an object that play a role in 'bottom-up attention'. (2.5 points per correct answer)
8. For systems that support operators in their task to closely monitor the various items displayed on radar screens (e.g., on board of a naval ship), which two types of support can be distinguished? (5 points per correct answer)
9. For the model on driver support, give an example of a qualitative concept and an example of a quantitative concept. (5 points per correct answer)
10. Mention 4 potentially negative consequences of using the type of intelligent support systems discussed in this course. (2.5 points per correct answer)

See the next page for the closed questions!

Closed questions:

11. What is not a property of 'weak agents'?
  - a) intentional
  - b) pro-active
  - c) reactive
  - d) social
12. What is not an 'internal agent concept'?
  - a) desire
  - b) history
  - c) passive observation
  - d) world model
13. How do we use backward reasoning within an analysis model?
  - a) from observed causes to believed effects
  - b) from observed effects to believed causes
  - c) from assumed actions to predicted effects
  - d) from desired effects to proposed actions
14. Which of these concepts does not play a role in the driver model from the reader?
  - a) alcohol level
  - b) drug level
  - c) emotions
  - d) fatigue
15. Which of these concepts does not play a role in the emotion contagion model from the reader?
  - a) channel strength
  - b) expressiveness
  - c) openness
  - d) sensitivity

16. Which of these models generates assessments?
- a) domain model
  - b) analysis model
  - c) support model
  - d) none of the above
17. Consider the following approach to validate the attention model: 'asking participants about their opinion on the system's actions to change the colour of the objects'. Which type of validation is this?
- a) subjective validation of the domain model
  - b) objective validation of the domain model
  - c) subjective validation of the support model
  - d) objective validation of the support model
18. What is the main source of information for a parameter adaptation model?
- a) an analysis model
  - b) a support model
  - c) data about human behaviour
  - d) domain-specific knowledge
19. Which of these parameters is not used in predator-prey models?
- a) attack rate
  - b) birth rate of the prey
  - c) conversion efficiency of consumed prey into predators
  - d) death rate of the prey
20. Microsoft Excel is an environment that is particularly suitable for developing \_\_\_\_ models.
- a) hybrid
  - b) logical
  - c) numerical
  - d) qualitative