Exam - Integrative Modelling *(Tuesday, January 13, 2015, 18.30-21.15)*

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.

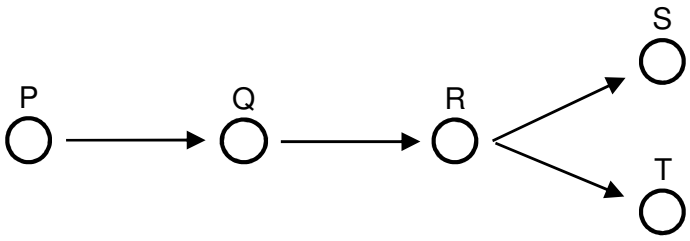
Open questions:

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. *Explain the difference between 'weak' and 'strong' agency. (10 points for a correct explanation)*

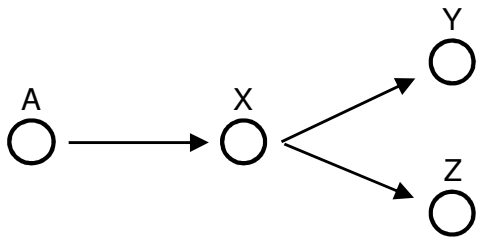
3. *For the development of agent models, typically five 'interface agent concepts' are used (in particular, three main concepts, two of which can be subdivided into two sub-concepts). Mention all five concepts (2 points per correct answer)*

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 backward reasoning. (10 points maximum; -2 points per incorrect circle or arrow)*

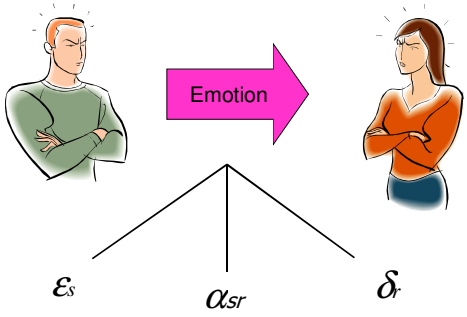


6. *Answer question 5 again, but this time using forward reasoning. (10 points maximum; -2 points per incorrect circle or arrow)*

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. *Consider the following picture describing the process of ´emotion contagion´. In the reader, a model of this process is presented, in which the strength of the contagion is dependent on three factors that are represented with the symbols ε_s, α_{sr} en δ_r. Which concepts do these three symbols represent? Give the concepts and provide a brief (informal) explanation for each of them. (3 points per symbol for the correct concept + explanation; 1 point free)*



10. *For the model on driver support, give an example of a <u>qualitative</u> concept and an example of a <u>quantitative</u> concept. (5 points per correct answer)*

Closed questions:

11. *What is not a property of 'weak agents'?*

    a) autonomous

    b) intentional

    c) reactive

    d) social

12. *What is not an 'internal agent concept'?*

    a) desire

    b) history

    c) passive observation

    d) world model

13. *What is abduction?*

    a) a method to convert a domain model to an analysis model

    b) a technique to run simulations

    c) a type of backward reasoning

    d) none of the above answers

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 scientist proposed the idea of the ´as-if-body-loop'?*

    a) Antonio Damasio

    b) Daniel C. Dennett

    c) Rosalind Picard

    d) Robert Plutchik

16. *In domains where professionals operate in complex and dynamic environments (such as aviation and the navy), the perception and interpretation of elements in these environments play an important role. What is the name of this process?*

    a) bottom-up attention

    b) extended mind

    c) situation awareness

    d) top-down attention

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. *For which model can supervised learning be used?*

    a) domain model

    b) analysis model

    c) support model

    d) parameter adaptation model

19. *Which of these parameters is <u>not</u> 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. *Approaches like 'temporal logic' and 'production rules' are difficult to use if you want to model __ processes.*

    a) cognitive

    b) dynamic

    c) human

    d) quantitative