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WRITTEN EXAMINATION  
“ECommerce”  
WINTER TERM 08/09  
March 2TH, 2009  
PROF. DR. RALF MÖLLER

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**Name, Student Id:**

**Name of curriculum:**

**Signature:**

**IT IS NOT PERMITTED TO WRITE ON THESE PIECES OF PAPER BEFORE THE START SIGNAL. IN ADDITION, WRITING ON THESE PIECES OF PAPER AFTER THE END SIGNAL WILL HAVE THE EFFECT THAT YOU DO NOT PASS THIS EXAM WITHOUT FURTHER WARNINGS. THIS ALSO APPLIES IF YOU WRITE YOUR NAME AND/OR STUDENT ID AFTER THE END SIGNAL.**

**Please note:**

- 1. Do not open the exam sheets until permitted by the supervisor!**
- 2. Put your student identification card as well as your passport on the table.**
- 3. If you are not registered for the exam, then fill out a proviso, which will be given to you by the supervisor.**
- 4. You have 90 minutes for answering the questions. Additional resources are not allowed.**
- 5. There is sufficient space for your solutions on the examination sheets.**
- 6. If you receive additional pieces of paper from the supervisor, please write your name and student Id also on these pages.**
- 7. If you need to leave the examination room, silently inform the supervisor.**
- 8. The exam is closed book. That means that the only things you are allowed to have on your desk or use during the exam are pens and the exam itself.**
- 9. All phones off. A switched on phone is considered cheating.**
- 10. Cheating will cause you to fail this exam.**

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- 1) Explain disintermediation and reintermediation in your own words. Provide a concrete example for a disintermediation scenario as well as for a reintermediation scenario.  
(2 pts)

- 2) Name and explain four different environment types used in the context of PEAS descriptions (Performance, Environment, Actuators, Sensors).  
(4 pts)

(continue your answer on the reverse of this sheet if necessary)

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- 3) In complex decision making scenarios it is often the case that it is impossible to search the complete search space. Name and explain two approaches that are used to reduce the search space. (4 pts)

- 4) List and explain the assumptions that are used to reduce the complexity of Dynamic Bayesian Networks. (4 pts)

(continue your answer on the reverse of this sheet if necessary)

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- 5) Hidden Markov Models (HMM) and Kalman Filters are special forms of Dynamic Bayesian Networks. Describe their particularities and the advantages of the „Country Dance“- algorithm for HMM. (6 pts)
- 6) There are two methods for finding the optimal policy in Markov Decision Process (MDP) Name and explain the two methods as well as the differences. (6 pts)

(continue your answer on the reverse of this sheet if necessary)

- 7) List and explain four criteria for evaluating Multi Agent Systems. (4 pts)

- 8) The following table shows three possible decisions for agents (D1, D2, D3) and the associated possible states (S1, S2, S3). For each state also the payoffs are given. (6 pts)

	S1	S2	S3
D1	+100 000	+40 000	-60 000
D2	+50 000	+20 000	-30 000
D3	+20 000	+20 000	-10 000

The probabilities of the states are:

$$P(S1)=0.1 \quad P(S2)=0.3 \quad P(S3)=0.6$$

The two agents have given the following utilities for the different payoffs:

Gewinn/Verlust	Agent I	Agent II
\$100,000	100	100
\$50,000	94	58
\$40,000	90	50
\$20,000	80	35
-\$10,000	60	18
-\$30,000	40	10
-\$60,000	0	0

(continue your answer on the reverse of this sheet if necessary)

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Compute the decision for the two rational agents based on the expected utility. How would characterize the risk behavior of the two agents (a graph for the utilities can help).

(continue your answer on the reverse of this sheet if necessary)

- 9) Imagine a decision for future products of an ecommerce store in which 100 voters express the following preferences:

#	51 voters	5 voters	23 voters	21 voters
<b>1st</b>	CD-Player	MP3-Player	DVD-Player	Plasma TV
<b>2nd</b>	MP3-Player	DVD-Player	MP3-Player	MP3-Player
<b>3rd</b>	DVD-Player	Plasma TV	Plasma TV	DVD-Player
<b>4th</b>	Plasma TV	CD-Player	CD-Player	CD-Player

- a. Determine the winning product using the Condorcet approach. (3 pts)

- b. Determine the winning product using Borda Count (3 pts)

(continue your answer on the reverse of this sheet if necessary)

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10) Name and explain two approaches for implementing recommendation systems. (4 pts)

(continue your answer on the reverse of this sheet if necessary)