

## SIKS- courses "Combinatory Methods" and "Learning and Reasoning"

Vught, May 09-13 2005

### Monday May 9

10.00 - 10.15	Welcome	<i>Richard Starmans (UU/SIKS)</i>
10.15 - 11.15	Neural Networks 1 Introduction: The Biology of Neural Networks (the biological computer, brain-inspired models, basic notions)	<i>Eric Postma (UM)</i>
11.15 - 11.30	Break	
11.30 - 12.30	Neural Networks 2 Attractor Neural Networks for Constraint Satisfaction (the stochastic neuron, statistical mechanics of many neurons, phase transitions and simulated annealing)	<i>Eric Postma (UM)</i>
12.30 - 14.00	Lunch	
14.00 - 15.00	Neural Networks 3 Feedforward Neural Networks (the perceptron, multilayer perceptron)	<i>Eric Postma (UM)</i>
15.00 - 15.15	Break	
15.15 - 16.15	Neural Networks 4 Neural Networks for Machine Learning (preprocessing, learning methodologies, some applications)	<i>Eric Postma (UM)</i>
16.15 - 16.30	Break	
16.30 - 17.30	Neural Networks 5 Overview of recent developments	<i>Eric Postma (UM)</i>
18.00 - 20.00	Dinner	

### Tuesday May 10

09.00 - 10.00	Constraint Satisfaction 1 -A practical problem and exercise -What is a Constraint Satisfaction Problem? Problem specification, examples and exercises	<i>Nico Roos (UM)</i>
10.00 - 10.15	Break	
10.15 - 11.15	Constraint Satisfaction 2 -Complexity van CSP's -Solution methods for CSP's (generate and test -> depth first search, backward checking, forward checking + exercise: zebra problem)	<i>Nico Roos (UM)</i>
11.15 - 11.30	Break	
11.30 - 12.30	Constraint Satisfaction 3 Constraint propagation (node, arc and path consistency, weak and strong k-consistency)	<i>Nico Roos (UM)</i>
12.30- 14.00	Lunch	
14.00 - 15.00	Constraint Satisfaction 4 Constraint propagation (node, arc and path consistency, weak and strong k-consistency)	<i>Nico Roos (UM)</i>
15.00 - 15.15	Break	
15.15 - 16.15	Constraint Satisfaction 5 Back jumping, Learning, Heuristics, Phase transition	<i>Nico Roos (UM)</i>
16.15 - 16.30	Coffee break	

16.30 - 17.30	Local Search (neighborhood space, hill climbing, min-conflict in CSP's, tabu search, simulated annealing)	<i>Nico Roos (UM)</i>
18.00 - 20.00	Dinner	

### **Wednesday May 11**

09.00 - 10.00	Intelligent search methods (conspiracy-number search, proof-number search, opponent-model search)	<i>Jos Uiterwijk (UM)</i>
10.00 - 10.15	Break	
10.15 - 11.15	Game programming (game programming basics, transposition tables, retrograde analysis in endgames)	<i>Jos Uiterwijk (UM)</i>
11.15 - 11.30	Break	
11.30 - 12.30	Heuristics in games (evaluations functions, move-ordering heuristics, directing knowledge)	<i>Jos Uiterwijk (UM)</i>
12.30 - 14.00	Lunch	
14.00 - 15.30	Adaptive learning systems	<i>Maarten v. Someren (UVA)</i>
15.30 - 16.00	Break	
16.00 - 17.30	Optimal Control and Reinforcement Learning	<i>Marco Wiering (UU)</i>
18.00 - 20.00	Dinner	

### **Thursday May 12**

09.00 - 10.30	Adaptive Hypermedia	<i>Alexandra Cristea (TUE)</i>
10.30 - 11.00	Break	
11.00 - 12.30	Probabilistic Reasoning	<i>Peter Lucas (RUN)</i>
12.30 - 14.00	Lunch	
14.00 - 15.30	Qualitative Reasoning 1 (Building Qualitative Models, demo)	<i>Bert Bredeweg (UVA)</i>
15.30 - 15.45	Break	
15.45 - 17.15	Qualitative Reasoning 2 (Building Qualitative Models, demo)	<i>Bert Bredeweg (UVA)</i>
18.00 - 20.00	Dinner	

### **Friday May 13**

09.00 - 10.30	Learning and Reasoning for Information Access	<i>Maarten de Rijke (UVA)</i>
10.30 - 11.00	Break	
11.00 - 12.30	Argumentation Systems	<i>Henry Prakken (UU)</i>
12.30 - 14.00	Lunch	
14.00 - 15.00	Knowledge Compilation 1	<i>Cees Witteveen (TUD)</i>
15.00 - 15.15	Break	
15.00 - 16.00	Knowledge Compilation 2	<i>Cees Witteveen (TUD)</i>
16.00 - 16.15	Evaluation / End of the course	