Learning Through Interaction

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This poster presents real-time learning through interaction. In sequential decision making domains and domains in which creating representative dataset is expensive and time consuming, learning through interaction is the only feasible way to train a system. Examples of such domains include system adaptation to particular user, control problems, learning to play games and similar.

Reinforcement learning is an approach for learning optimal action policy via experiencing, i.e. using observed reward in environment states. Reinforcement learning algorithms include adaptive dynamic programming, temporal difference learning and Q-learning[1]. Examples of successful applications of reinforcement learning are controller for sustained inverted flight on an autonomous helicopter [2] and learning to play the soccer game Keepaway[3].

We researched possibilities for adaptation of rule-based alarm detection system in the domain of remote elderly care using the CONFIDENCE system [4]. Experimental results show that reinforcement learning can be used for adaptation of the alarm detection system to the particular needs and preferences of the user.

References:

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[3] P. Stone, R. S. Sutton, and G. Kuhlmann. Reinforcement Learning for RoboCup-Soccer Keepaway. In *Adaptive Behavior*, 13(3), pp.165–188, 2005
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