

LEARNING THROUGH INTERACTION



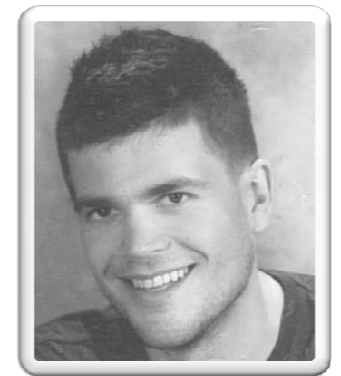
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Imagine playing chess without any knowledge about the rules of the game. After hundred or so moves, your opponent says, "Yes, you loose!". How can you use this feedback in order to develop successful playing strategy?

LEARNING OPTIMAL BEHAVIOR THROUGH INTERACTION

Sequential decision making problems which are difficult to be represented with examples accurately and consistently

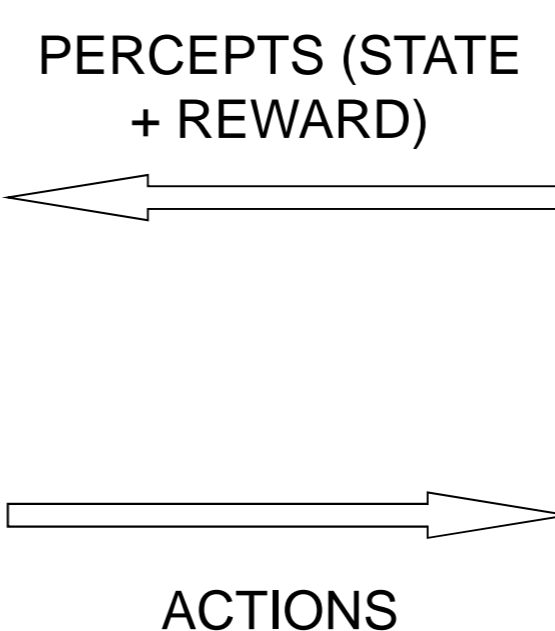
- System adaptation to user based on received feedback: user does not evaluate every low level action the system makes, but overall system performance
- Control: a traffic system can measure the delay of cars, however it is difficult to develop a strategy how to decrease the delay using this kind of data.
- Game playing: player knows whether it wins or loses, however this does not provide information how to move at each step.

REINFORCEMENT LEARNING

Learning from success and failure

- Adaptive dynamic programming
- Temporal difference learning
- Q-learning

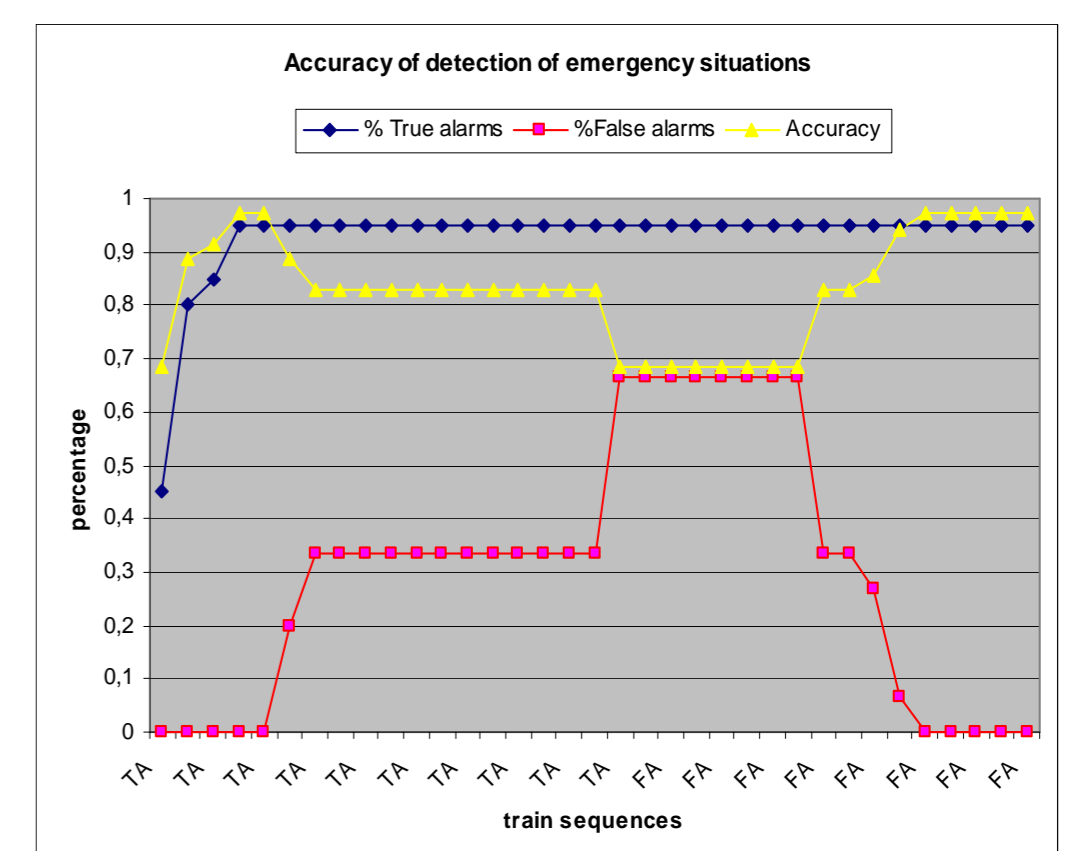
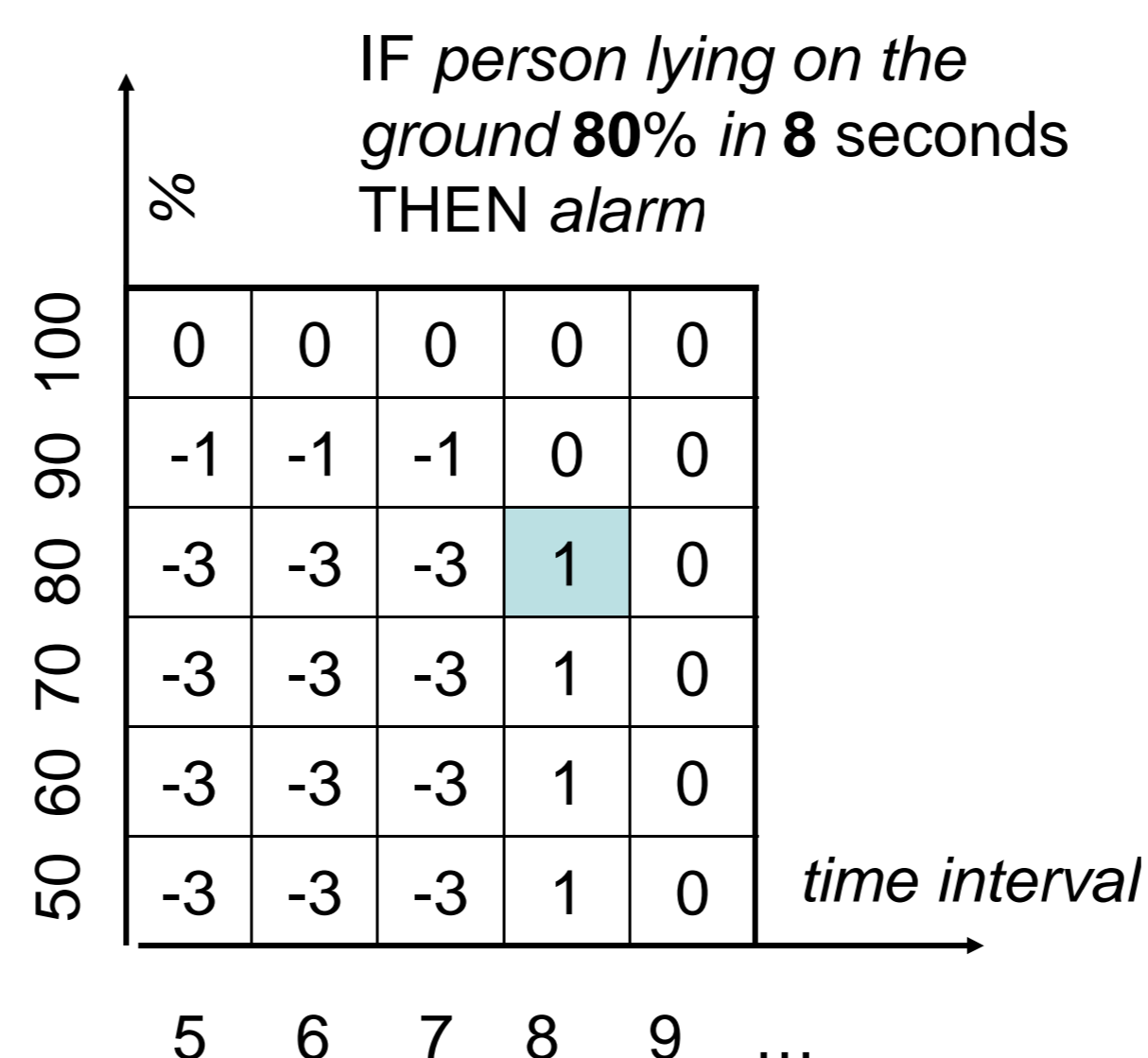
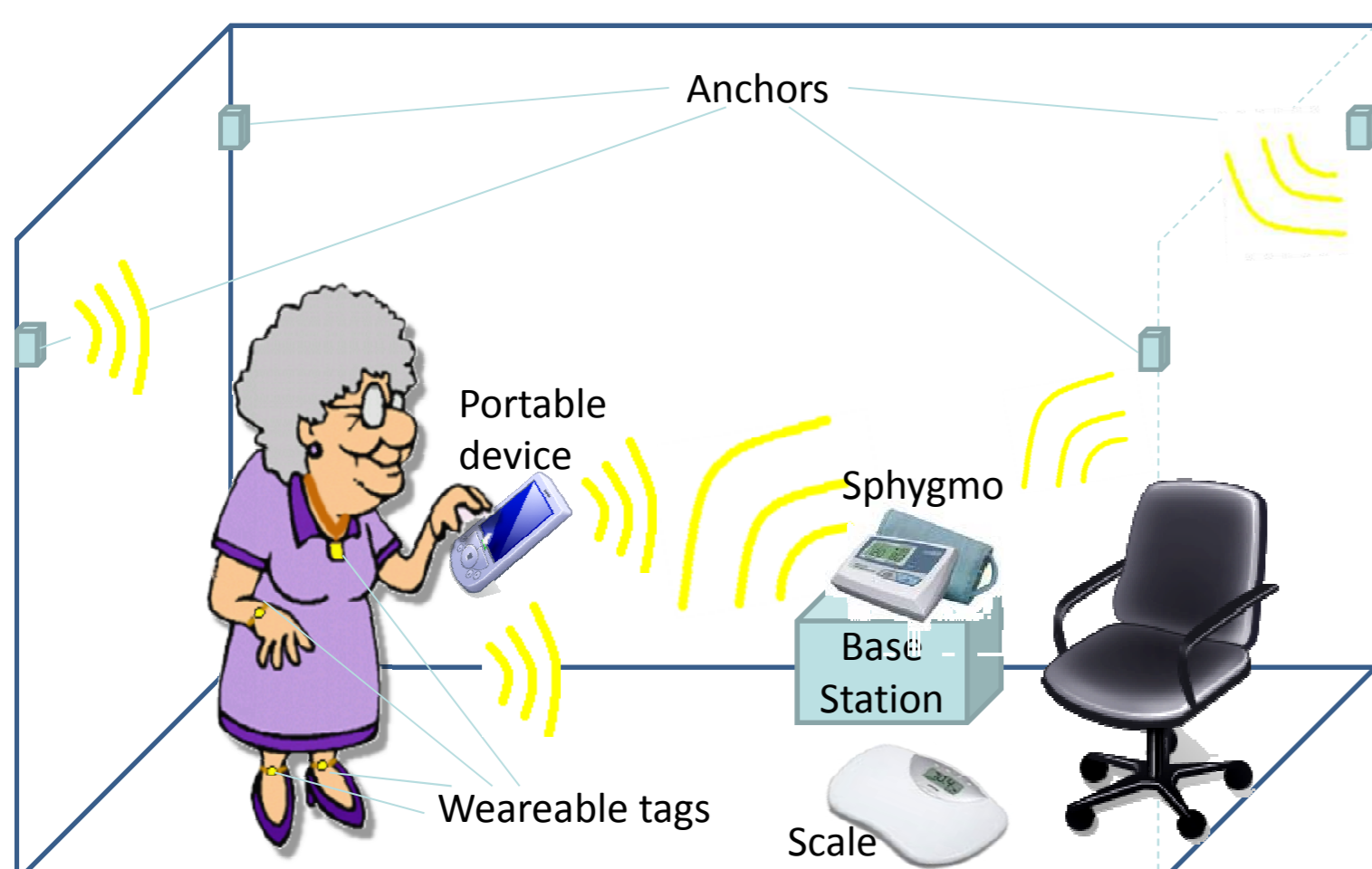
» EXPLORATION VS EXPLOITATION «



* Peter Stone, Richard S. Sutton, and Gregory Kuhlmann.
Reinforcement Learning for RoboCup-Soccer Keepaway.
Adaptive Behavior, 13(3):165–188, 2005.

APPLICATIONS

REMOTE HEALTH CARE – DETECTION OF EMERGENCY SITUATIONS



* CONFIDENCE Ubiquitous Care System to Support Independent Living - <http://www.confidence-eu.org/>