Studentische Mitschrift von
André Egners
Last Update: November 8, 2006

<Introduction to AI: Notes>

<Wintersemester 06/07>

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Abstract

This document only provides the notes Prof. Lakemeyer makes on the board during the lecture.
I do not claim this document to be without errors, so if you find any, please contact me at andre.egners@rwth-aachen.de .

Contents

Vorlesung [30.10.2006]

1 Agents

Ideal Agent

- automatic taxi driver
  - sensors: GPS, radar, camera, microphone, odometer
  - actuators: steering wheel, brake pedal, accelerator, loud speaker
  - percepts: location, traffic signs, directions from customer, distance to other cars
  - performance (means/goals): safety of customer, avoid traffic tickets, earn money, reach destination quickly, comfortable ride
  - environment: traffic, streets, weather, customers

Note: Goals may interfere.

Reflexive Agents

if car_in_front_brakes **then** decelerate
if stop_sign_ahead **then** brake

Agents with internal world model

Example: Remember that you saw a car in the rear mirror.

Vorlesung [06.11.2006]

Vacuum Robot (for the corresponding example see slides)

Actions: Left, Right, Suck
Goal States: all rooms are clean (states 7,8)
$1 \xrightarrow{S} 5 \xrightarrow{R} 6 \xrightarrow{S} 8$ robot is happy now. (this is a **single-state** problem)
$\{1, 2, \ldots, 8\} \xrightarrow{R} \{2, 4, 6, 8\} \xrightarrow{S} \{4, 8\} \xrightarrow{L} \{3, 7\} \xrightarrow{S} \{7\}$ (**multiple-state** problem)

Murphy's Law for vacuumers:

"Sucking dust sometimes generates dust, but only if the room is clean."

$4 \xrightarrow{S} \{4, 2\}$
$\{1, 3\} \xrightarrow{S} \{5, 7\} \xrightarrow{R} \{6, 8\} \xrightarrow{S} \{6, 8\} \ldots$
(**contingency** problem)
Solution:$\{1, 3\} \xrightarrow{S} \{5, 7\} \xrightarrow{R} \{6, 8\} \xrightarrow{sense\_dust} \{.\} \xrightarrow{if\_clean->noop;if\_dirty->suck} \{8\}$