

Chapter 33. Ubiquitous Artificial Intelligence

The Quest for Artificial Intelligence, Nilsson, N. J., 2009.

Lecture Notes on Artificial Intelligence

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Overview of Chapter 33

- Applications of the AI
 - At home
 - Driving
 - Navigating
 - Game

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33.1 AI at Home

AI at Home

- What you might find today (or sometime soon)
 - thermostats for heat and air-conditioning systems that anticipate temperature
 - microwave ovens that read barcodes on packages to determine how long to cook an item
 - washing machines that automatically adjust to different conditions to wash clothes better
 - refrigerators that automatically inventory their contents and inform owners of needed items
 - cameras with computer vision systems to identify faces and to control focusing, exposure, and framing
 - hearing aids that adapt to ambient sound levels and block out 'cocktail party' chatter
 - robotic pet "animals" and toys that interact with people

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33.2 Advanced Driver Assistance Systems

Advanced Driver Assistance Systems

- **ADAS (Advanced Driver Assistance Systems)**
 - adaptive cruise control (ACC) for providing more intelligent control of speed
 - intelligent speed adaptation (ISA) for monitoring local speed limits
 - lane control systems for monitoring the presence of vehicles or obstructions in adjacent lanes and for monitoring when a driver drifts into an adjacent lane or off the roadway
 - automatic parking systems for assisting a driver when executing a parallel parking maneuver
 - traffic sign recognition systems
 - driver drowsiness detection systems
 - intelligent tire pressure control systems

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33.3 Route Finding in Maps

Route Finding in Maps

- Navigation device for automobiles
 - Specialized A* algorithm for two-dimensional maps
 - Google
- Estimated travel times
 - Microsoft's 'ClearFlow'
 - Using Bayesian networks
 - Traffic-monitoring sensors to estimate traffic densities

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33.4 You Might Also Like...

You Might Also Like...

■ Collaborative (social) filtering

- Recommendation system of 'Amazon.com'
- A DB of preferences (books, movies ...) is maintained for every user
- iTunes, TiVo and Netflix have same recommendation systems

■ Content-based filtering

- Analyzing to find similarities with other items and the most similar items are recommended

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33.5 Computer Games

Checker-Playing Program

- The late 1960s~the mid-1970s
 - Computer chess programs gradually improving from beginner-level to middle-level
- 1959-1962
 - John McCarthy & a group of MIT students developed a chess-playing program
- 1967
 - Kotok-McCarthy program : The first match to be played by a computer against a computer
 - MAC HACK VI : the first program to play against human
 - It won two games, drew two games, 1450th on US
- “The basis of human chess strength, by contrast with computers, is accumulated knowledge” -Berliner