



Part II

Methods of AI

Chapter 3

Knowledge and Reasoning





Chapter 3 – Knowledge Representation and Reasoning

- 3.1 Summary of Logic and Reasoning
- 3.2 Reasoning: Deduction Systems
- 3.3 Rulebased Reasoning
- 3.4 Knowledge Representation:
General Issues
- 3.5 Knowledge Representation:
Semantic Nets
- 3.6 Knowledge Representation:
Description Logics
- 3.7 Knowledge Representation:
Analogue Representation





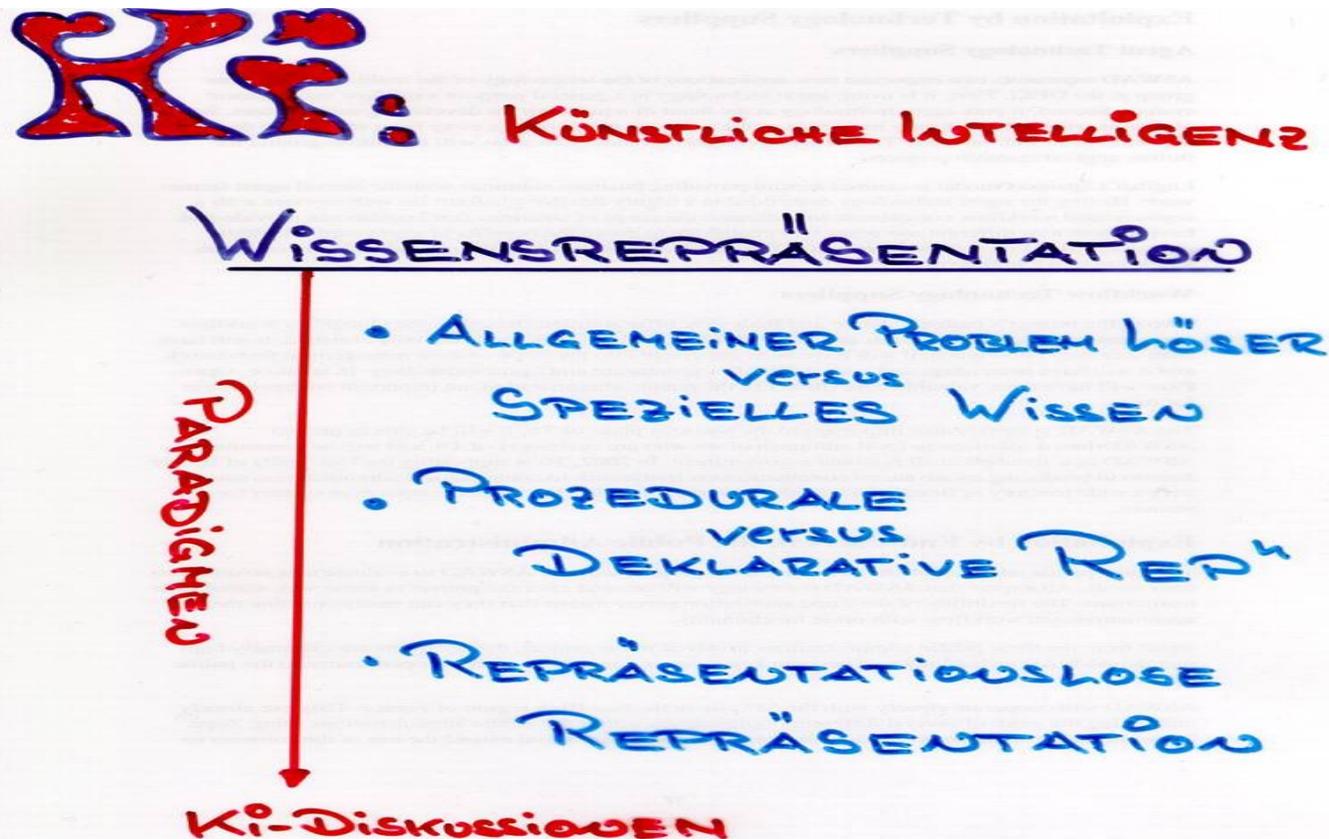
3.4 Knowledge Representation

General Issues



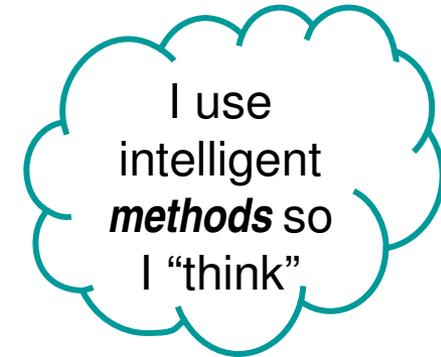
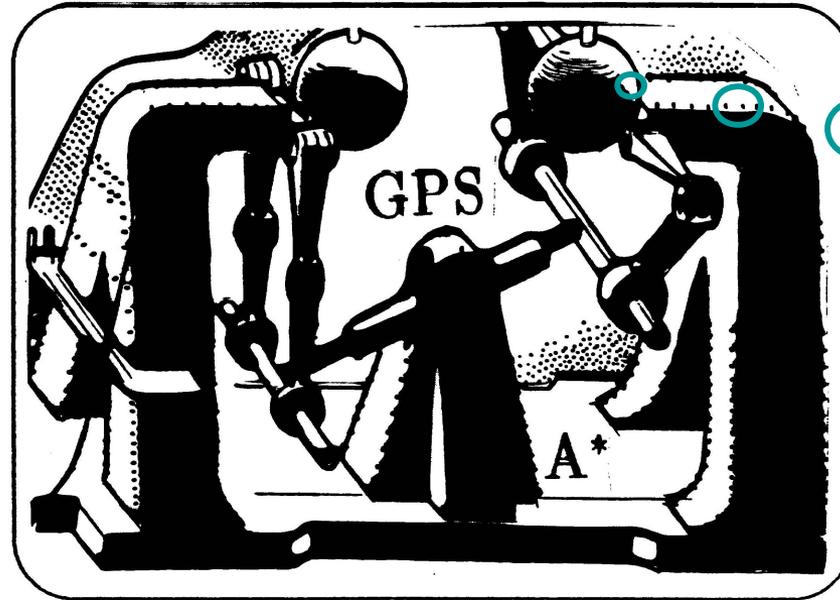


Three Historical Paradigms in Artificial Intelligence



Good old fashioned AI (GOF AI-1)

“General Principles for Symbol Manipulation in AI”



Paradigm: General Search, but no specific Knowledge
„One had not to ‘cheat’ by giving the problem-solver the solution in any sense.“ (Pat Hayes 1974)

But: Humans don't use only general methods for problem solving, but also domain specific knowledge

And: there are inherently knowledge intensive very specific tasks!



Good old fashioned AI (GOF AI-2)

“General Principles for Symbol Manipulation in AI”



I use
knowledge -
so I “think”!

This lecture!



- TOPICS:
1. Representation of Knowledge
 3. Effective methods to apply this knowledge



New fashioned AI (NeFAI-3)

“Intelligence without Representation” ?



Let the world
be its own
representatio
n – and I
“think”

- Neuronal Nets
- Rodney Brooks
- Patty Maes
- etc

TOPICS:

1. Symbolic versus Subsymbolic Representation
3. Subsymbolic Repⁿ - Methods: - Subsumption Architecture
- Neural Networks
. . . and others.

