Case Based Reasoning: Learning from the Case Base

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AI Knowledge Sources

Knowledge acquisition from experts

Learning from large-scale data streams

Learning from a single experience
Exploiting Experiences

In a [medical] conference attended by a respected professor from another hospital, the chief of a service calls on that [professor], … with a request not for the latest news of research from the journals but for an anecdote: Anybody had any experience with this? (Hunter, 86)
Building AI Systems that Make the Most of Each Experience

Practical Goals:
• Enabling reasoning from limited data
• Providing customized solutions
• Providing explainable solutions

Strategy: Case-Based Reasoning
• Cognitively inspired reasoning and learning from cases
• Memory + Analogical mapping + Adaptation to fit
Case-Based Reasoning (CBR)

CBR solves new problems by remembering similar prior problems and adapting their solutions to fit new needs.

CBR is both a cognitive model and an AI approach.
Sample Projects

- Mining provenance information to support workflow generation
- Mining Web sources for knowledge to adapt cases
- Using large case bases to generate adaptation rules on demand
- Metareasoning to improve use of existing cases
- Case-base maintenance
- Case-based support for knowledge capture (collaboration with Institute for Human and Machine Cognition)