Course: Common Sense Reasoning

15. Other Applications of Common Sense Reasoning

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The “Discrete Event Calculus Reasoner” has been applied to multiple problems

Software engineering

- Validate specifications, check consistency of diagrams and problem descriptions

Robotics

- Reason about knowledge and sensed information

Security

- Threat and confidentiality analyses

Virtual cinematography

- Spatial reasoning for virtual cinematography

Video games

- Simulate game playing and answer questions about a game

Web services and business processes

- Verify specifications, develop consistent contractual policy

Common sense can be used to extend knowledge bases

- ConcepNet has been used to help complete the content of knowledge bases
- Examples:
  - [Li, et al., 2019]
  - [Malaviya, et al., 2019]

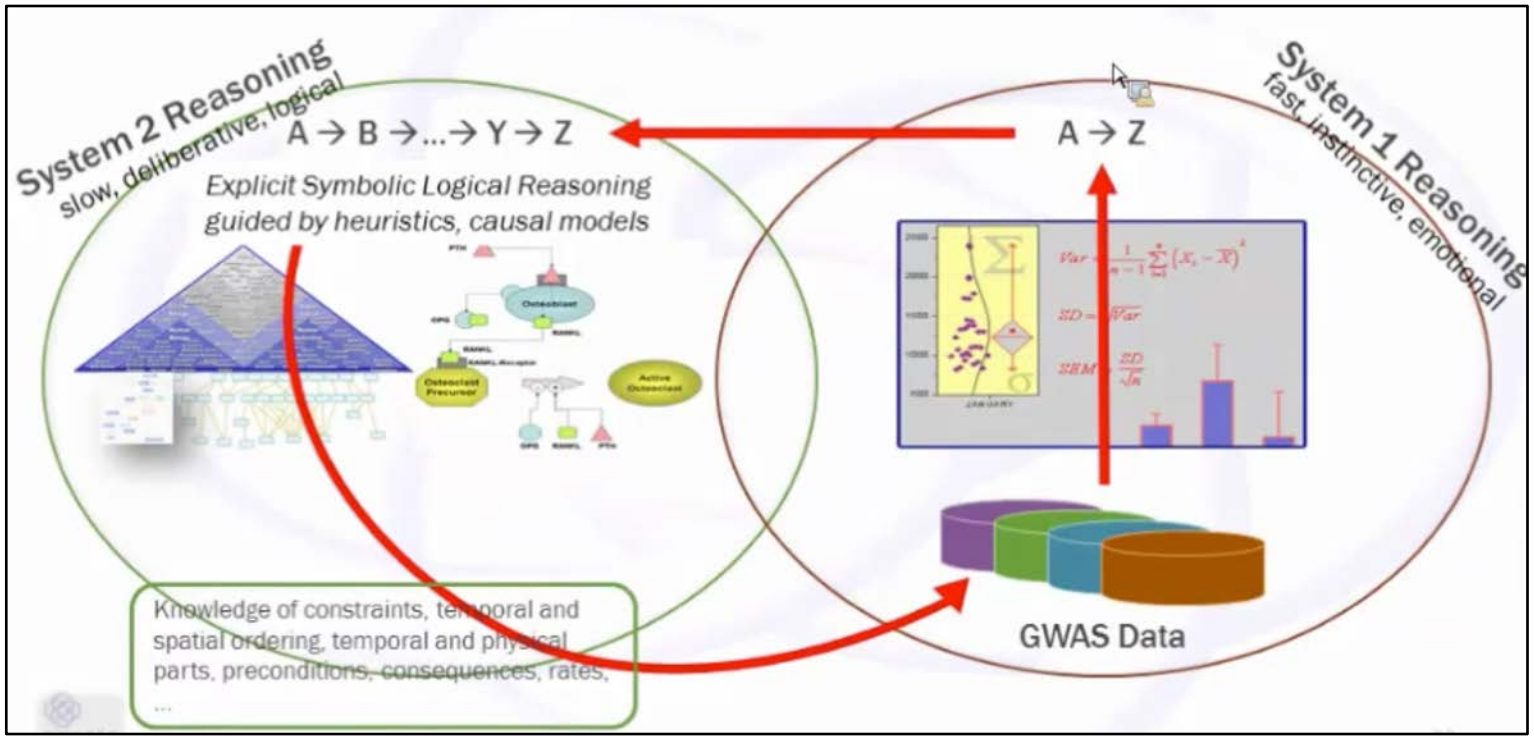
Forbus suggests multiple applications of qualitative reasoning

[Forbus, 2008]

- Automating or assisting professional reasoning:
  - Engineering problem solving (e.g., mechanical design)
  - Economics and decision support
  - Ecology and bioinformatics
- Education
  - Modeling environments for education
  - Self explanatory simulators
  - Conceptual tutoring
- Cognitive modeling
  - Mental models reasoning
  - Natural language semantics

Lenat suggests that common sense can be used to generate and confirm scientific hypothesis

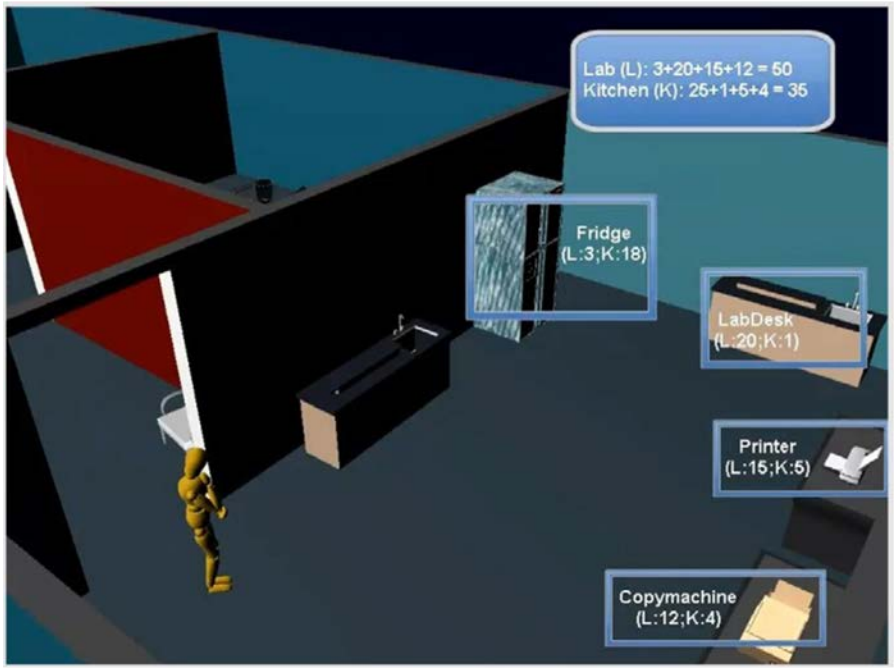
- Cyc technology can take data correlations and try to put together a rationalization (a causal argument).
- The generated rationalization can be used to confirm or reject correlations and to generate testable hypothesis



Video: https://youtu.be/2w_ekB08ohU

Video: https://youtu.be/4mv0nCS2mik

Cyc has been used to learn how to classify spaces by virtual characters



Cyc has been used to generate expectations of the objects that can be found in a room (in the context of computer games)

[Li, Allbeck, 2012]

Johnston suggests multiple practical applications of common sense reasoning

[Johnston, 2009]

- Assist human users by identifying and correcting commonsense errors and omissions:
  - A spreadsheet application that detects valid but nonsensical formulas
- Provide intelligent and context-sensitive assistance to users:
  - An online travel agent that infers the user's budget, travel objectives and preferences
- Increase the autonomy and initiative of artificial systems:
  - Calendar software that attempts to reschedule non-critical appointments if a flight is delayed
- Enable mass customization of digital artifacts:
  - Generate legal contracts by identifying appropriate paragraphs
- Appropriately respond to outlier or exceptional data:
  - A credit authorization system that recognizes the child of a wealthy or important customer

Course “Common sense reasoning”.

Work citation in APA style:

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