Crime Scene Modeling & Diagnosis

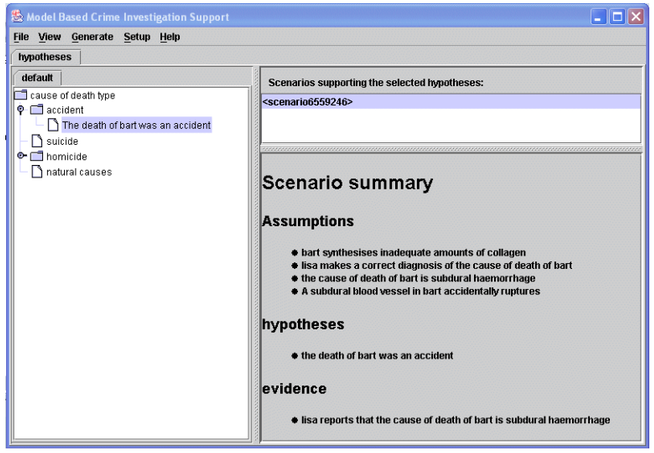
Model-based reasoning to help distinguish homicides from suicides

Description:

- The variety of possible crime scenarios is almost infinite and therefore difficult to store in a decision support system.
- This system automatically constructs representations of crime scenarios.
  - By storing component events of scenarios.
  - And providing an algorithm to compose these components into scenarios.
- It then refines scenario likelihoods through constraint propagation.
- A prototype application has been developed.

Technical approach:

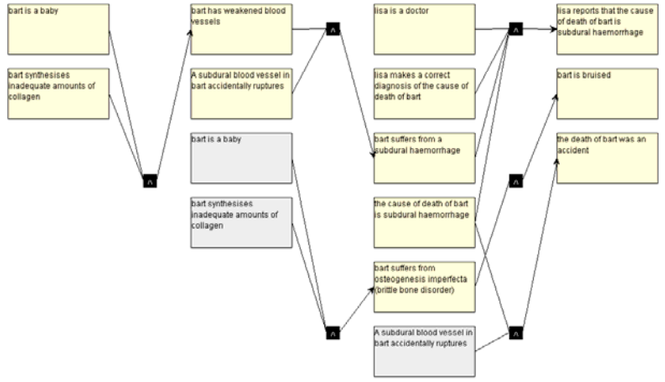
- Model based reasoning provides robustness in domains where not everything is black & white.
  - By using domain knowledge to guide creation and combination of models.
  - instead of requiring problem-specific reasoning.
- Backward reasoning generates new or combined scenarios.
- Forward reasoning identifies evidence that would distinguish scenarios.
- ***Success through good selection of a reasoning technique.***



Example of a scenario

Benefits:

- Can provide information such as
  - Which scenarios may have produced the available evidence?
  - What evidence can be expected if a certain scenario were true?
  - Which sources of evidence may help differentiate between two or more alternative scenarios?



Causal hypergraph

Acknowledgement for image of mock crime scene: Massachusetts State Police Crime Laboratory

Joseph Bell Centre for Forensic Statistics & Legal Reasoning

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