

CSCI 5582

Artificial Intelligence

Lecture 12
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Today 10/10

- **Finish FOL**
 - FW and BW chaining
- **Limitations of truth conditional logic**
- **Break**
- **Basic probability**

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Inference

- Inference in FOL involves showing that some sentence is true, given a current knowledge-base, by exploiting the semantics of FOL to create a new knowledge-base that contains the sentence in which we are interested.

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Inference Methods

- Proof as *Generic Search*
- Proof by *Modus Ponens*
 - Forward Chaining
 - Backward Chaining
- Resolution
- Model Checking

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Generic Search

- **States** are snapshots of the KB
- **Operators** are the rules of inference
- **Goal test** is finding the sentence you're seeking
 - I.e. Goal states are KBs that contain the sentence (or sentences) you're seeking

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Example

- Harry is a hare *Hare(Harry)*
- Tom is a tortoise *Tortoise(Tom)*
- Hares outrun tortoises
$$\forall x, y \text{Hare}(x) \wedge \text{Tortoise}(y) \rightarrow \text{Outruns}(x, y)$$
- Harry outruns Tom?

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