

PHIL 371  
**Week 4: Concepts & Google Cars**

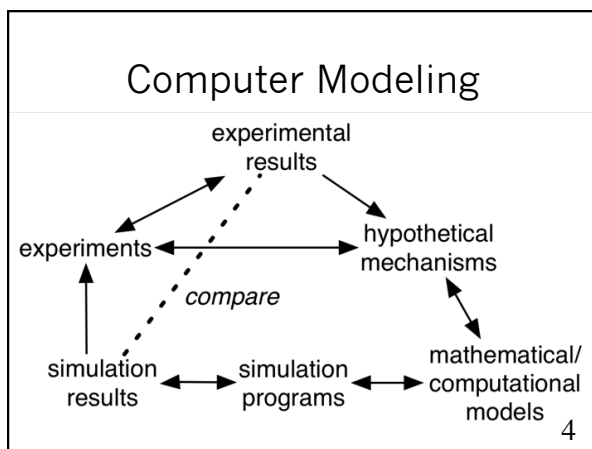
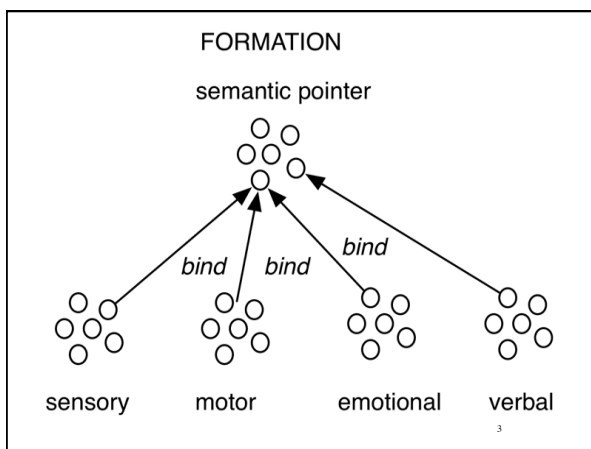
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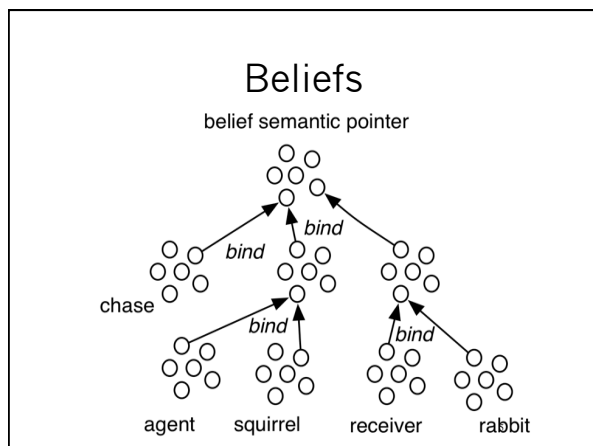
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## Concepts 3-analysis

1. Exemplars: *ungoogleable*, etc.
2. Typical features: mental representation, roughly correspond to words, learned
3. Explanations:
  1. explain categorization, language use, inference, etc.
  2. explained by semantic pointers

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### Discussion Questions


How well do semantic pointers explain how concepts are learned and used in problem solving, language, etc?

Do octopuses have concepts?



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### What CYC does



Started by Douglas Lenat in 1984.

OpenCyc 4.0 (2012) has 239,000 concepts and 2 million facts

Many applications: military (e.g. terrorism), medical, etc.

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### How Does it Work?

**Representations:**

- Concepts organized into an "ontology" (conceptual system)
- Facts (rules) expressed in formal logic

**Procedures:**

- Logical inference (deduction)
- Special purpose inference modules (> 1000)

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### Discussion Question

How does CYC compare with IBM Watson? Humans? What are CYC's strengths and weaknesses?

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### CYC Strengths

1. Huge data base of organized concepts and facts
2. Many kinds of inference
3. Rigorous formalization
4. Overcomes brittleness of ordinary software

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### CYC Limitations

1. Concepts have word-word meaning, but not word-world meaning
2. Concepts are purely verbal, not multimodal, e.g. vision
3. Requires heavy formalization
4. Limited in recursive binding, imagery, analogy, emotions, consciousness, creativity

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### CYC vs. Humans

1. Advantages of CYC: huge data base, easily transferred, not distracted
2. Advantages of humans: multimodal concepts, emotions for motivation, recursive binding, creativity, context
3. CYC can't access as much info as Watson, but has more reasoning

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