

COGSCI 300
Week 4: Concepts & CYC

Please turn off and put away all electronics.

Reality:
 What
 a
 concept!

Robin Williams

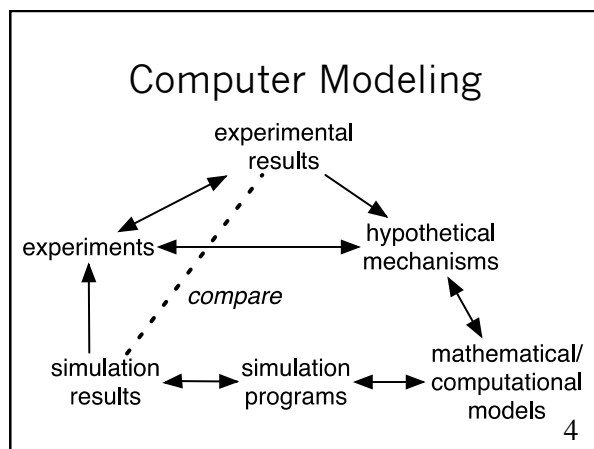
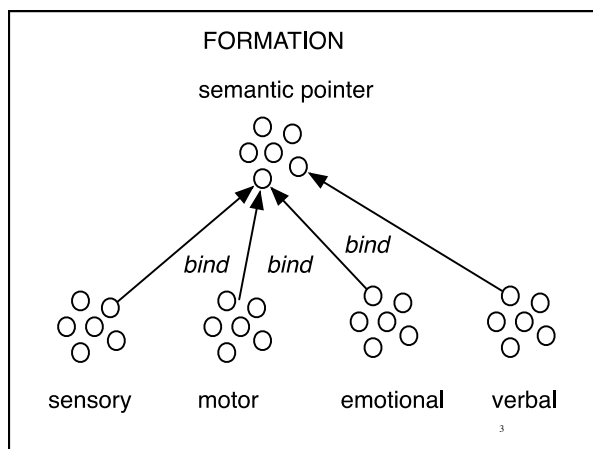
© Share Inspire Quotes - <http://shareinspirequotes.blogspot.com>

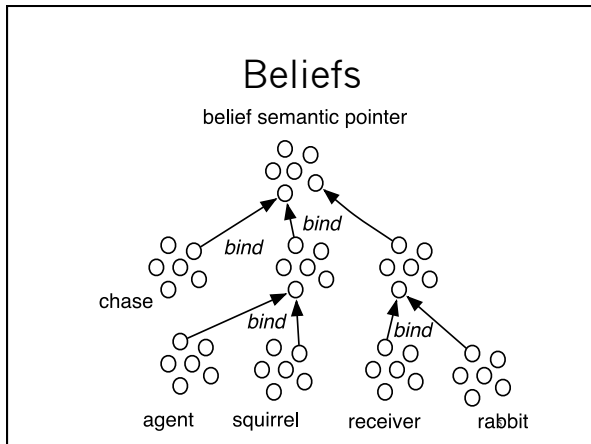
1

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

2






Discussion Questions


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

Do octopuses have concepts?



6

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.

7

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)

8

Discussion Question

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

9

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

10

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

11

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

12