Meaning Machines
CS 672
Deictic Representations (4)

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Agenda

Using deictic representations
Ballard et al

Computing rich representations
Siskind – Juan presenting

Discussion
How does language reflect the computational relationships between mind and world?

What might a robot need to do the same?

Motivating deictic representations

Strategy for making vision goal-directed and using its results
- "do-it-where-I'm-looking" strategies.
- Placing a grasped object: the location can be selected using an eye fixation and that fixation can then be used to guide the hand movement.

Motivating deictic representations

Working memory as a "deictic" representation
- In the same way fixation maintains a physical link with an object that determines what gets computed, attention/memory maintains a cognitive link that determines what gets remembered.

Acting on deictic representations

Programs – picking up a green block in a stack:

- Fixate(Green)
- Fixate(Top-of-where-I'm-fixating)
- Pickup
- Fixate(Somewhere-on-the-table)
- Putdown
- Fixate(Green)
- Pickup

Acting on deictic representations

Deictic primitives simplify complex behaviors because each sensory-motor primitive defines the context for its successor using only the information immediately fixated or attended.

Arguments

Why only a few memory items?
- It works.
- Smaller search space for planning and learning.
- Don't have to worry about information getting stale.
- Interface between cognitive and perceptual/motor functions.

Deictic strategies in behavior

Model
Pickup
Dropoff

M-P-M-D copying