Lecture 14b: Probabilistic Latent Semantic Analysis (paper discussion)

CS540 4/26/18

Project #2 Presentation

Much better
- Timing
- Organization
- Clarity

Why?
- Experience
- Something else?

What did you learn?
- About subgoals
  - Block-to-x, clear, support, near?
- About path planning
  - Often simple, but when its not…
  - Recursive? Call-backs?
- Problem definition
- What else?

Project #3

Optional
- Due Wed., May 9th
- Do as a group
  - If some don't want to, you may add new members

Task
- Write a program that takes in
  - An initial blocks world state (as in Projects 1 & 2)
  - An English language statement describing a goal state
- Your program should generate plan to accomplish goal state
  - Translate sentence into goal state
  - Solve as in Project #2

What's Due
- 4 page paper, same format at Project #2
- Except this time, you create the test cases

Project #3 (cont)

Example

Start state matching Project #2, Problem #1

Sentence: *Put a red block on top of a tower of height 5*

Alternative sentence: *Put a red block on a black block*

Approach

Use code from web – don't build from scratch

Brill parser, Stanford parser, etc

Translate into goal frames

(x1, y1, z1, color1)

Example: (?, ?, 5, red)

Alternate: (x1,y1,z1,black) (x1, y1, z1+1, red)

Advice

Choose examples to show *strengths & limits* of your system

Probabilistic Latent Semantic Indexing

Reading assignment

Thomas Hoffman. *Probabilistic Latent Semantic Indexing.* ACM SIGIR Forum, 51(2), 2017. (Original: 1999)

Explain the Bayesian Model

$$P(w|d) = \sum_{z \in Z} P(w|z)P(z|d)$$

$$P(d,w) = \sum_{z \in Z} P(z)P(w|z)P(d|z)$$

What does this look like graphically?

PLSI (cont)

Mixture model

Bottleneck variable

Expectation Maximization
- Tempered EM

Word Perplexity

ROC curve

Factor Representation