DynamicSlide: Reference-based Interaction Techniques for Slide-based Lecture Videos

Motivation
Lecture slide and narration are complementary
- Lecture slide: Information hierarchy & content
- Narration: Detailed explanation for each item

Interaction techniques
Highlighting currently explained item
- Attribute Classification
  - Discrete Attribute: Has a finite or countably infinite set of values
  - Continuous Attribute: Has real numbers as attribute values
- Binary attributes are a special case of discrete attributes
  - Examples: zip codes, click counts, set of words in a collection of documents

In-video highlighting and navigation
1. Hover over the attribute
2. Click to highlight

Highlighting items are collected and used for navigation

Pipeline for object-oriented video interaction

Ongoing Work
Editing support for slide-based videos
How can we find and leverage the link between slide and narration (reference)?

Motivation
Unlike offline lecture, the content of lecture video is not frequently updated
- Instructor’s editing need > Instructor’s editing expertise
- Editing often involves substituting the original slide content

How can we build a tool to help instructors directly update their video without having to patch and re-publish?

Example changes made by instructors
- Updating text (a) and figures (b)
- Updating verbal explanations (c)
- Highlight a slide item (d) in sync with explanation (e)