RELECTURE

Lecture slides and voice recording synchronizer

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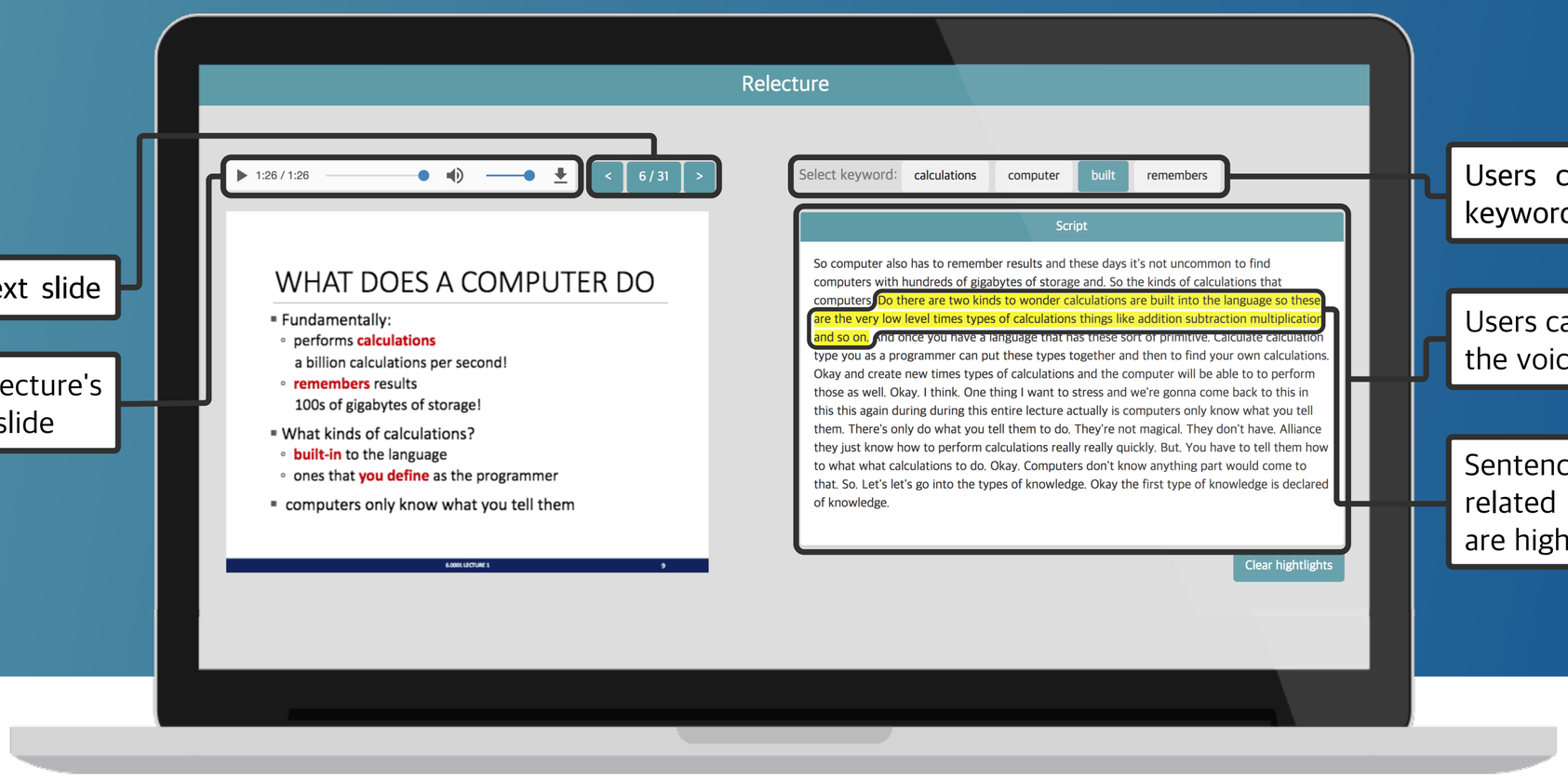


OVERVIEW

- Given a voice recording of a lecture and the lecture slides, synchronize them so that each slide is matched with its corresponding portion of the voice recording
- Instead of the user having to find the starting points of a slide in the recording, when user selects a slide the lecture recording for that slide is provided
- Text scripts of the recording and automatic highlighting of keyword related sentences are provided to make studying more effective

PROBLEM STATEMENT

- Many students voice-record their lectures to listen to it when revising
- Finding a slide's exact starting point in the long recording is difficult
- We want a smarter way to use and combine the lecture recording and slides

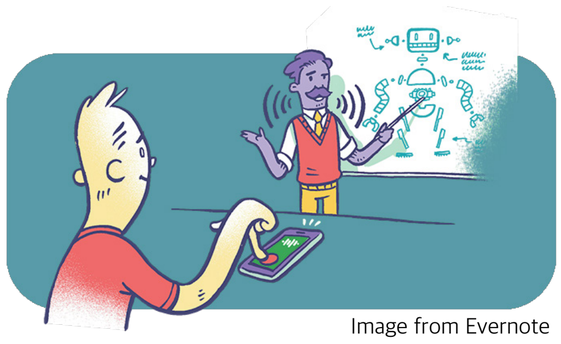


Image from Evernote

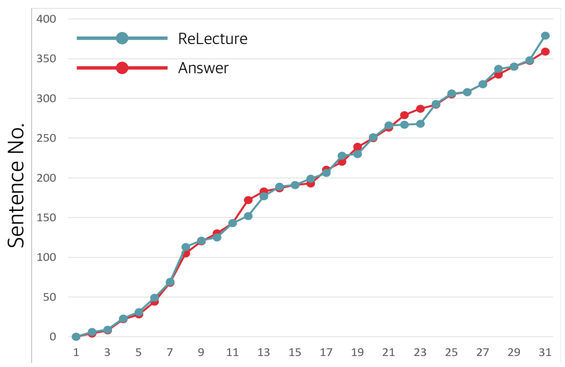
TECHNICAL CHALLENGES

- Accuracy of voice-to-text conversion (Solved using custom dictionary)
- Accuracy of text script and lecture slides synchronization
  - Picking meaningful keywords that represent each slide (NLP, slide layout)
  - Finding the correct metric and mechanism to match slides' keywords with sentences in text script

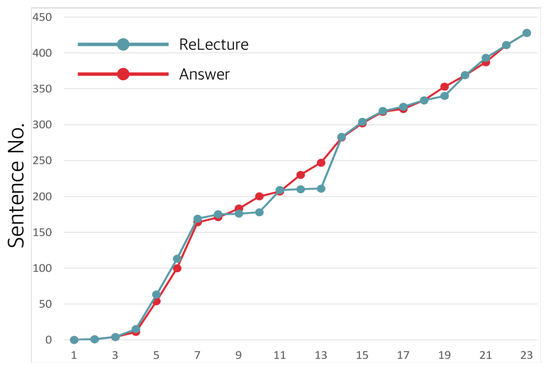
ACCURACY

- Lecture Domain: MIT-Introduction to Computer Science and Programming in Python (Fall 2016, Instructor: Dr. Ana Bell)

Lec01: What is Computation?



Lec05: Tuples, Lists, Aliasing, Mutability, Cloning



OVERALL FLOW

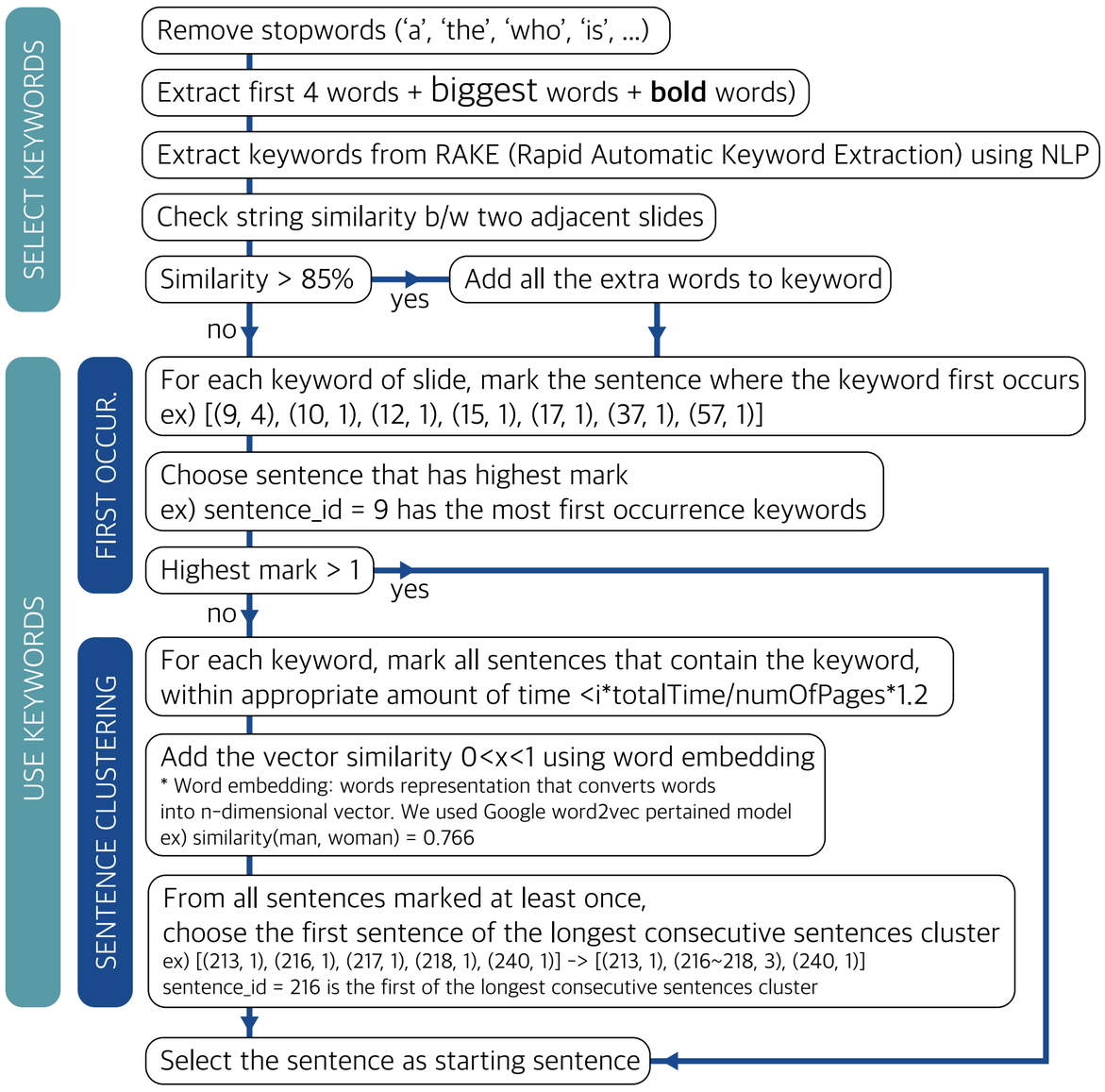
VOICE TO TEXT CONVERSION

- Used IBM Watson Speech to Text
- Accuracy of voice-to-text improved by using a custom dictionary
- Dictionary words picked out from contents of the lecture slides except stop-words ('a', 'the', 'who', 'is', ...)

PDF TEXT EXTRACTION

- Used PyPDF2 library from Python
- Extract texts from each slide

SYNCHRONIZATION



HIGHLIGHTER

- We provide keywords & highlighting function for each page
  - Highlight words contain top 2 words that occur the most in the text script & top 3 bold words of the slide that occur the most in the text script