

**MICHIGAN STATE**  
**UNIVERSITY**

# Project Plan Presentation

## Making STEM Papers Accessible to ASL Users

### The Capstone Experience

Team Microsoft

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*From Students...  
...to Professionals*

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# Project Sponsor Overview

- Microsoft Corporation is a Fortune 500 American multinational technology corporation
- Headquartered at the Microsoft Redmond campus located in Redmond, Washington

Best-known software products:      Flagship Products:

- Windows OS
- Office Suite
- Internet Explorer & Edge Browsers

- Xbox Video Game Console
- Surface PC's



# Project Functional Specifications

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- Enable users who sign with ASL interpret words on STEM papers
- By making a translation reading tool
- Accessible as a Chrome extension
- On average, people who are hard of hearing have lower literacy
- This tool enables these users to read scientific papers and make contributions to the STEM community



# Project Design Specifications

- Users interacts with STEM paper (or any text)
- By enabling a Chrome extension UI
- And highlighting an English word or phrase for which an ASL Translation is required
- Triggers a popup with videos to ASL translations of the word
- And similar terms on the document
- Which is determined by back-end Natural Language Processing model



# Screen Mockup: Word Highlight



Displays Chrome extension UI when the user highlights a word for which that want an ASL translation

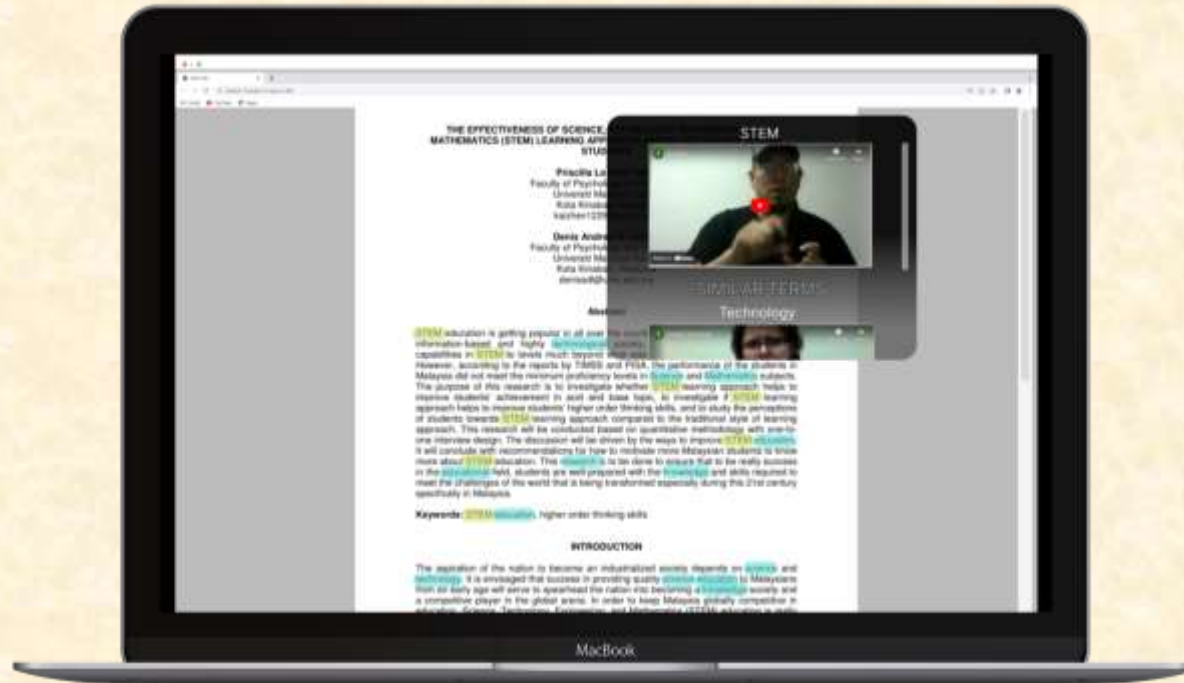
# Screen Mockup: Sentence Highlight



Displays Chrome extension UI when the user highlights a sentence for which that want an ASL translation

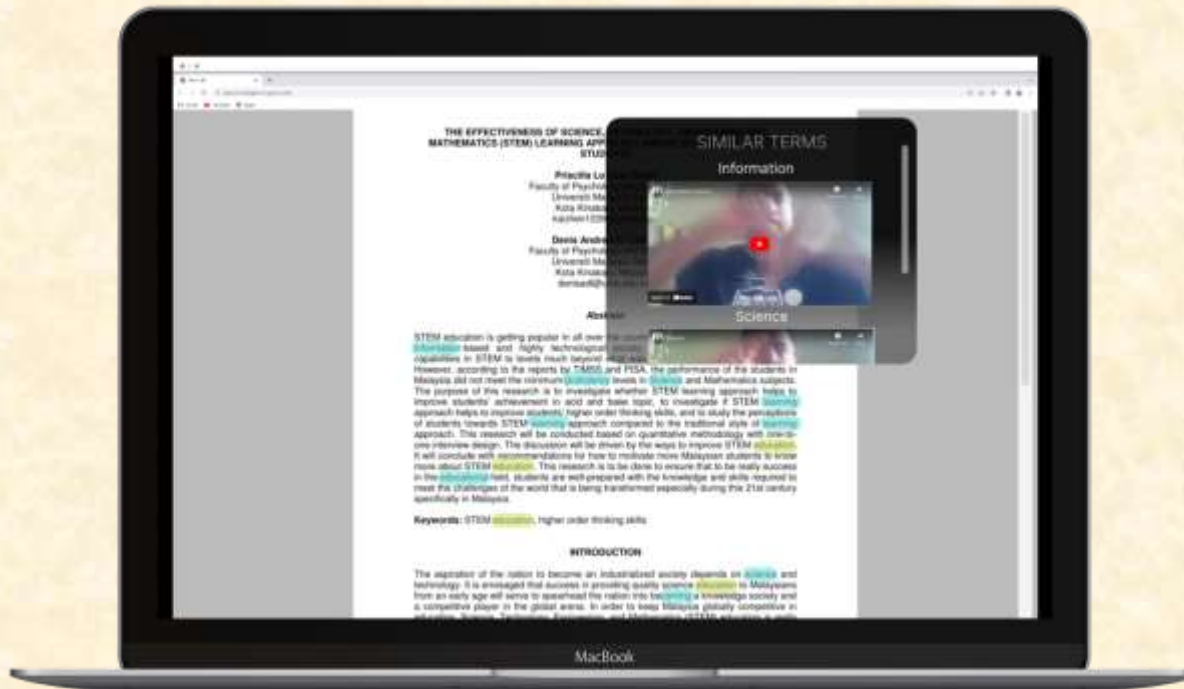


# Screen Mockup: Word + Similar words



Displays Chrome extension UI when the user highlights a word for which that want an ASL translation and back-end ML model highlights very similar terms in the document

# Screen Mockup: Similar words



Displays Chrome extension UI when the user highlights a word for which that want an ASL translation and back-end ML model highlights very similar terms in the document

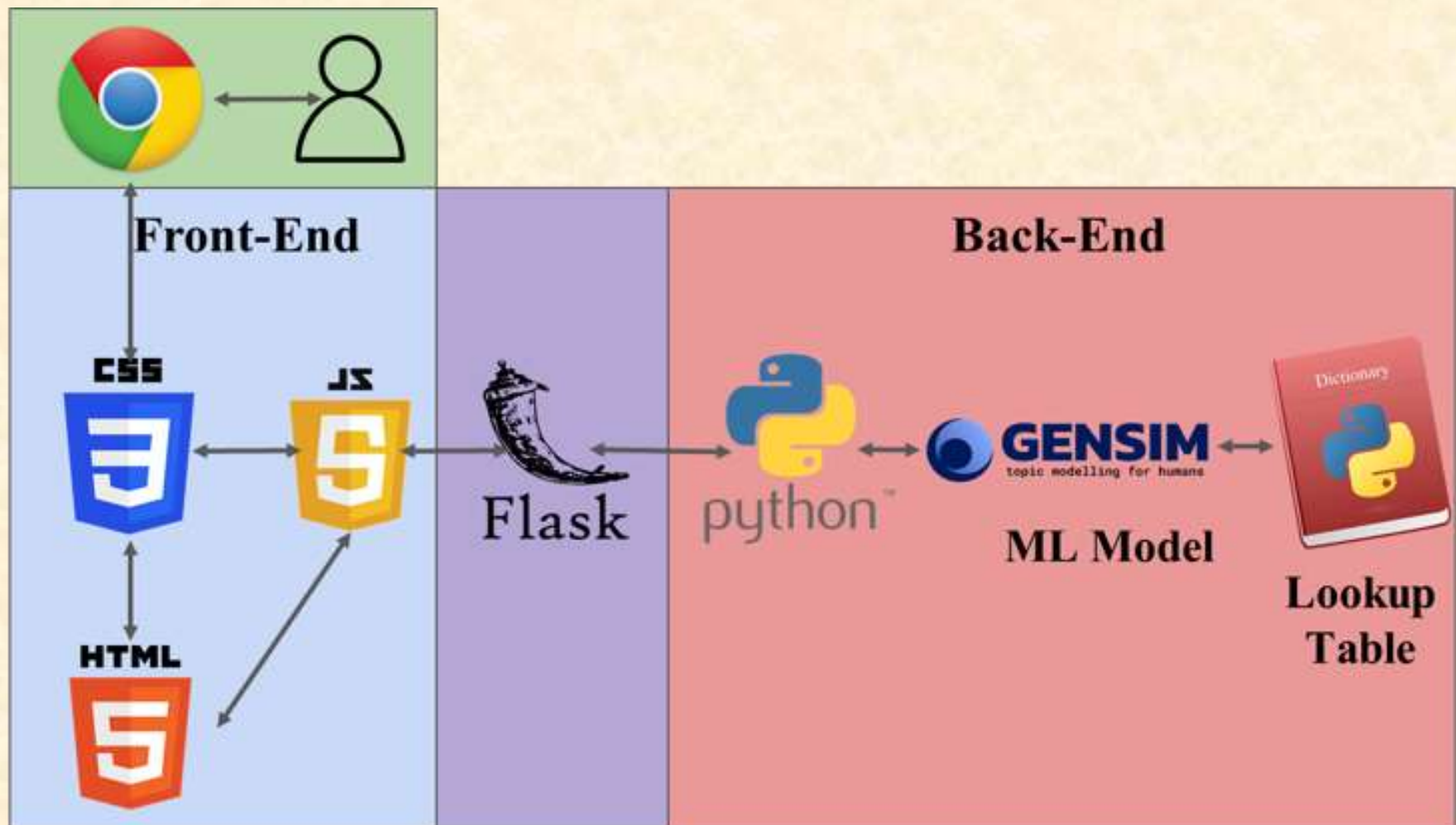


# Project Technical Specifications

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- Front-end: HTML, CSS, JavaScript
- Back-end: Python
- Machine Learning Library: Gensim
- Connected via Flask

# Project System Architecture



# Project System Components

- Software Platforms / Technologies
  - Gensim Python Library
  - API Reference – Chrome Developers
  - Signing Savvy
  - ASL STEM



# Project Risks

- Don't understand ASL
  - None of the team members have any experience with ASL
  - Learn basic ASL and Microsoft promised to provide external help
- User experience and presentation of feature should be easy for user to understand
  - Chrome extension is limited in its size and functionality
  - Design the front-end with minimal click/operation, and gather feedback on the prototype from end user
- Word-by-word translation will not always be appropriate
  - Some concepts require two or more words combined to get the underlying meaning
  - Provide alternative resources like YouTube search results to reduce potential errors
- Enhance the model through cross-lingual entity linking
  - Uncertain on how to build a robust model using Cross-Lingual entity linking
  - Client provided resources and researches on the specific model



# Questions?

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