Project Plan Presentation
Making STEM Papers Accessible to ASL Users
The Capstone Experience

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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 • Xbox Video Game Console
• Office Suite • Surface PC's
• Internet Explorer & Edge

Browsers
Project Functional Specifications

• 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 they want an ASL translation.
Screen Mockup: Sentence Highlight

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

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

Front-End
- CSS
- HTML
- JS

Back-End
- Flask
- Python
- GENSIM
- ML Model
- Lookup Table

Dictionary
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?