Mid-Term Proposal UX and AI

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What is my main problem?

This project was inspired by me noticing how much visual content is prevalent in academics. Many college students struggle with understanding complex visual content in academics. Sometimes traditional learning tools don't cater to non-visual learners and those who are visually impaired.

My main goal:

Evaluate whether my hypothesis about students struggling with visual content and wanting an audio-based tool was accurate. So, I set out my research with three main questions:

- 1. Do students struggle with visual content, and if so why?
- 2. Is there a demand for audio-based assistant tools?
- 3. How do students believe AI can assist with interpreting visual content, and what are the limitations of current technology and techniques in this area?

User Research

Two Surveys:

- First survey: focused on current or newly graduated students from college.
- Second survey: targeted the visually impaired community

Two Interviews:

- One who is a regular student and one who is a visually impaired individual.

Insights:

- There is a high demand for audio-based assistance
- People want detailed step-by-step explanations of the image.
- Interactivity can become a feature.
- People might prefer an AI-assistant tool because they believe they are not as biased as real-life people.
- People want a quick and easy way to upload PDFs, images, or real-time captures to the AI assistant.

User Experience Map



Thoughts

Emotions

Mary James (Main User)

Description:

Mary is a graduate UX design student. She often struggles with academic visual content outside of lectures while doing homework.

Goal:

- 1. Minimize search time for explanations on homework material involving visual content.
- 2. Make sure that there are accurate explanations for the visual content

Phase 1 **Encountering the Visual** Barrier A student is currently reading a user design Action article for design impact and she has to use the article to brainstorm her designs for homework. College student(Main user) Visually impaired student(Secondary user) Stakeholders She finds it difficult to understand some of the graphs in the readings because there is no clear definitions provided about the Obstacles

numerical data behind the graphs. This can lead to her not understanding the article as a

Visually impaired student(Secondary user)

The visually impaired student struggles with interpreting the image as the website reader that he currently uses only translate from text to audio. It does not pick up the image design

"Ah, the article references the graph but it does not give any specific context or explanation of what the graph means."

"Ah, I remember the professor talking about the general idea of this graph but I need a refresher."

Curiosity, Hope

Checking Lecture Slides

Phase 2

The student attempts to find the lecture slides from the course website to revisit the professor's lectures, hoping it will clarify her understanding of the content.

College student(Main user)

Visually impaired student(Secondary user)

Professor

Overall Struggles:

Situation A: The lecture slides provide an overall definition of the overarching concept. but there is minimal explanation or no specific definitions related to the graph in the article. This makes it difficult to understand the graph's significance.

Situation B: The student finds that the lecture slides are either not available online or are incomplete, making it difficult to get the full context behind the graph

"I wish there was a more detailed explanation here for this specific graph"

"Hmm. The professor didn't upload the slides

Uncertainty, Not understanding

Phase 3 Seeking help from

friends

The student, struggling to understand the design graph, reaches out to a classmate for help, hoping to get clarification on the graph's meaning and how it relates to the article.

College student(Main user)

Visually impaired student(Secondary user)

Classmate

Overall Struggles:

The classmate also struggles with interpreting the graph, and gives a vague answer, leading to confusion. The classmate could also potentially not remember the exact definition of the graphs taught in class.

The classmate does offer their interpretation, but it's different from what the student expected, leading to confusion.

"This is still confusing and the explanation was vague and because of that I don't know if it's

"That is an answer I didn't know existed. But, I'm not sure how much of it was an individual's hias?

Frustration and confusion

Phase 4

Web Search

After realizing that they can't get help from either the lecture slides or classmates, The student turns to the internet to find more information and explanations, hoping to get a clearer understanding of the visual content and its context. Visually impaired students struggle more in this instance or even don't use web search at

College student(Main user)

Visually impaired student(Secondary user)

Various Search Engines

The student finds too many articles with general design theory that don't specifically address the graph in question. The search results are too broad. too general, and too much, making it hard to find useful

The student spends a lot of time browsing through various articles videos and forums but the results don't directly address their question, leading to wasted

Visually impaired student(Secondary user) Struggles:

Some online resources may have poor accessibility features, such as images are too small to magnify, causing the images to be blurred when using a magnifier, preventing the visually impaired student from gaining any useful understanding of the visual material

"There are so many results, how am I supposed to know which one is directly related to my article? I don't have time to go read through a 5-paged article on this topic

"I can't make sense of this graph. The screen reader can't describe it properly, and the image is so low quality it won't allow the screen reader to pick up."

Frustration, Confusion, Overwhelmed,

Asking for Help from the Professor

Phase 5

After struggling to find a clear answer through the internet search, the student decides to approach their professor for more guidance.

College student(Main user)

Visually impaired student(Secondary user)

The professor might be too busy to provide immediate assistance, making it difficult for the student to get the support they need in a timely

The student feel that the professor's help is not enough to clarify the graph and may not feel comfortable asking for further clarification.

The students are apprehensive about approaching the professor, as they don't want to seem unprepared or incapable of understanding the material

"I don't want to appear like I haven't been paying attention. What if the professor thinks I should already understand this?"

"The professor is probably busy with their work and with other students, they'll probably take a few days to reply back."

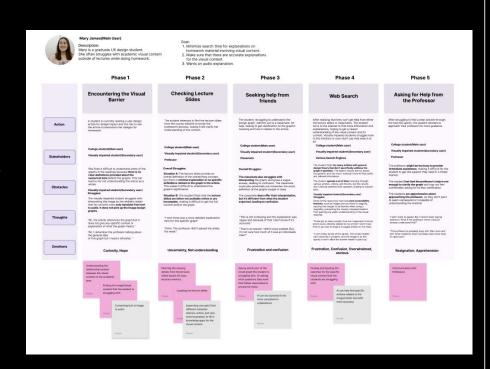
Resignation, Apprehension

3 Pain Points

- 1. Lack of Accuracy & Vague Explanations
 - a. This is mostly centred around peer/fellow classmate feedback in the user journey where the student asks around to figure out visual content.
- 2. Difficulty in Finding Specific & Relevant Explanations
 - a. When searching for visual content, search engines often give results that are not specific to the exact image or graph in question, making it difficult to find relevant insights.
- 3. Time-Consuming
 - a. Students spend a lot of time re-reading lectures just to understand a single visual graph/content.
 - Students waste time manually trying to filter through multiple sources (articles, videos..etc) to find the right explanation.

Cognitive Offloading

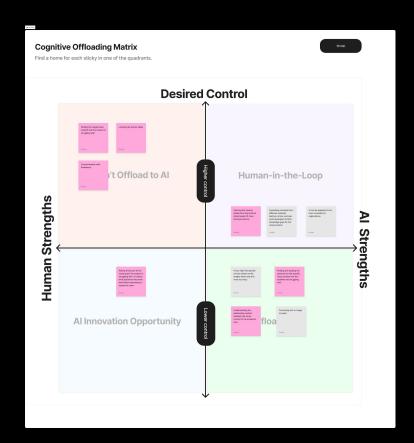
- I decided to focus on each phase of the user experience and brainstorm which part of the phase needs AI offloading.
- Human Offloading:
 - I wanted them to still make the decision-making process and I wanted students to keep their "freedom of choice"



Cognitive Offloading

Two moments:

- Finding and analyzing academic content
 - Reduces time spent on manual searches
- Connecting & Expanding Explanations from Different Sources
 - AI processes large datasets and it can reduce the cognitive load of manually piecing together information.



Solution 1: AI-Interactive Explanation Tool

What: Image to Text interactive tool that helps students eliminate the issue of broad and vague statements or explanations. It help targets specific areas of the graph.

Who:

- Main users: College students in data-heavy majors.
- Secondary users: Visually impaired students

When:

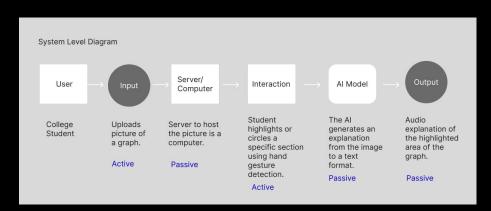
 After lectures/during homework when students encounter a graph they don't fully understand.

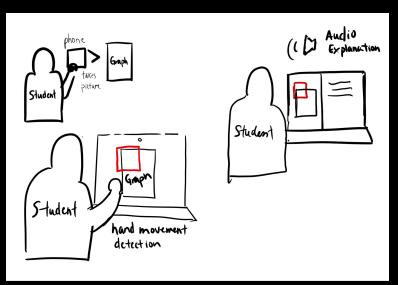
How:

- Students upload their graph/chart they don't understand and then circle a specific area that they need AI to explain.
- AI will then analyze and give an audio explanation

Tech: Image-to-text Computer Vision Models, Text to Speech Models(Hugging Face Kokoro-82M), Machine Learning hand gesture detection

Solution 1: AI-Interactive Explanation Tool





Solution 2: AI-Academic Synthesizer

What: Extracts keywords and finds direct connections between diagrams and past lectures, reducing the time spent searching for explanations.

Who:

- Main users: College students in data-heavy majors.
- Secondary users: Visually impaired students

When:

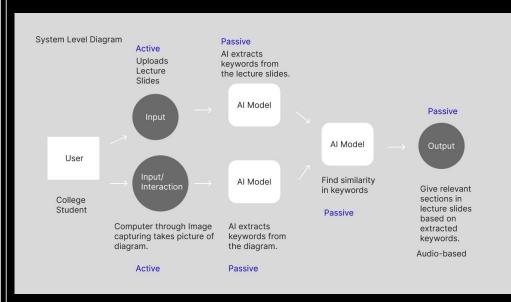
- When students are reviewing notes but struggle to locate or synthesize explanations from previous materials.

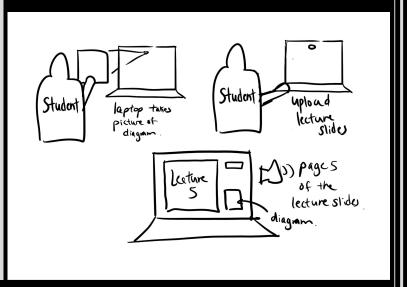
How:

- Students scan/upload a diagram into the AI program and also upload a copy of their class lectures
- The AI extracts any text and keywords from the diagram and also from the class lectures.
- If the texts and keywords matches, the AI will identify the page of the lecture through audio

Tech: Image-to-text Computer Vision Models(text extraction), Text to Speech Models(Hugging Face Kokoro-82M)

Solution 2: AI-Academic Synthesizer





Solution 3: Wearable Smart Eyeglass

What: A wearable smart glass system that provides instant explanations of visual content and retrieves relevant research articles.

Who:

- Main users: College students in data-heavy majors.
- Secondary users: Visually impaired students

When:

- When students who want instant explanations of visual content.
- When students struggle with manual searches for relevant academic sources.

How:

- Students wear smart glasses (Meta Ray-Ban) and use voice commands to capture an image of the visual content they need explained.
- Students instruct the glasses to take a picture and upload it to a connected computer program.
- The computer program scans the image, extracts keywords, and retrieves relevant research articles.
- The AI reads aloud the titles and authors of the recommended research articles.

Tech: Smart Glasses(Meta Ray-Ban), Image to text machine learning models, AI model that can search research articles(API's for scholarly articles) Text to Speech Models(Hugging Face Kokoro-82M)

Solution 3: Wearable Smart Eyeglass

