

Design Document - SummarAIze

Project Title: SummarAIze

Team Name: PAKAN

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Overview

We want to make research papers more accessible to the general public and easier for multimodal learning, meaning audio and video formats. We hope to aid researchers, instructors, and students with this tool.

System Architecture

- **Frontend:** React, Tailwind CSS
- **Backend:** Flask (Python)
- **Auth:** Firebase Auth
- **Database:** Firebase Firestore
- **Storage:** Firebase Storage
- **LLM Integration:** OpenAI GPT-4 API
- **Voiceover/Video:** Python (moviepy, pyttsx3, ffmpeg)
- **Deployment:** Vercel (Frontend), Render (Backend)

System Design

1. File Upload & Preprocessing

- Accepts PDF input
- Extracts relevant information

2. Summarization & Literature Review

- Uses GPT API to generate:

- Summary (short/medium/detailed lengths)
- Related research paper recommendations

3. User Account System

- Login/register using Firebase Auth
- Stores video history in the “Library”

4. Multimedia Output

- Visuals generated into video format
- Audio narration synthesized

5. Presentation Generator

- Converts summary into a slide-style layout

User Flow and Data Flow

User Flow

1. User logs in or signs up.
2. Uploads a research paper (PDF)
3. Selects summary type (beginner, intermediate, advanced)
4. Can look at the content generated: visuals, narration, and presentation
5. Downloads or saves the result (to library)

Data Flow

1. User Upload
2. Flask API
3. Text Extraction
4. GPT-4 Summary
5. Generate Visuals/Audio
6. Output onto Display

Testing Strategy

- Manual Testing

- Performed for all sprints
- Acceptance Criteria
 - Checking to make sure it adheres to all of our Acceptance Criteria