AI-Powered Research Paper Management System

Overview

Develop an intelligent research paper management system that allows users to upload, organize, analyze, and interact with academic research papers. The system should leverage AI to provide intelligent insights, summaries, evaluations, and answer questions related to the uploaded papers.

Core Features

Research Paper Upload & Management (Required) (5%)

- Allow users to upload PDF research papers
- Organize papers with metadata (title, authors, publication date, keywords, etc.)
- Search and filter functionality for the paper library

AI-Powered Paper Analysis (Required) (90%)

1. Intelligent Summarization (20%)

- Generate comprehensive yet concise summaries of uploaded papers
- Identify and highlight key findings, methodologies, and conclusions
- Present the paper's core contributions clearly

2. Interactive Research Assistant (40%)

- Implement a conversational AI chatbot that can answer specific questions about papers
- System must determine which paper(s) the query relates to when not explicitly mentioned
- Support both general questions about papers and specific technical inquiries

3. Quality Assessment & Recommendations (30%)

- Score papers based on multiple factors (writing quality, methodology, adherence to academic standards)
- Provide detailed feedback on areas of improvement
- Suggest specific changes to enhance the paper's quality
- Identify potential issues with citations, statistical methods, or experimental design

User Interface (5%)

X-Factor Features (Optional, up to +20% bonus points)

Evaluation Criteria and Testing Methodology

Evaluation Breakdown

1. Summarization Quality (20%)

- **Testing Method:**
    - A set of research papers will be uploaded, and the summarization quality will be checked (hallucinations and completeness would be considered).

2. Chatbot Performance (40%)

- **Testing Method:**
    - Each submission would be presented with a fixed set of questions, and the output for each question would be rated based on accuracy (whether the system giving correct answer or not), paper identification (determines which paper contains relevant information) and robustness to complicated queries. Each query would only pertain to a single research paper. Points rewarded in this section would be proportional to the average performance of your submission on the questions based on the given metrics.

3. Scoring Mechanism (30%)

- **Testing Method:**
    - 3 high-quality papers and 3 papers with known flaws will be evaluated
    - Systems must assign higher scores to high-quality papers and lower scores to flawed papers.

4. X-Factor Features (Up to 20% bonus)

- **Testing Method:**
    - Functionality and implementation of optional features will be evaluated
    - Points will be awarded based on usefulness, innovation, and technical implementation

Technical Requirements and Guidelines

- Participants can use any combination of frameworks, libraries, and APIs

- You may use Gemini’s API for your LLM-related work
- You have to submit your code repository with a clear README documentation, with instructions for setting up and running your code.
- A link to a short video showcasing the working of your code.