FoodWizard: YouTube Video Summarization and Recipe Recommendation System

Rutuja Manohar Kute

INFO7375 53043 ST: Prompt Engineering

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Introduction

Overview of the Project

- FoodWizard is application designed to collect, summarize, and recommend recipes from YouTube videos and scrapped recipes.

Objectives and Goals

- Provide a solution for summarizing cooking tutorials.

- Offer personalized recipe recommendations.

Importance and Relevance

- Aligns with AI and app development concepts taught in the course.

Project Description

Detailed Description

FoodWizard allows users to input YouTube URLs in any language, automatically summarizes the video content in English, and user can also search personalized recipe recommendations.

Specific Problem Solved

Streamlines the process of finding and managing cooking tutorials, reducing time and effort for users. Enable users to understand different language recipe.

Scope

Focus on essential features, running entirely on local machines may deploy it to cloud as future scope.

Project Architecture

Components and Interactions

- User Input: Users input YouTube URLs.

- Summarization: Open AI Whisper and GPT-4 Turbo summarize video content.

- Recommendation System: Provides personalized recipe recommendations.

- User Interface: Built with Streamlit for ease of use.

Technologies and Tools Used

- FastAPI, OpenAI Whisper, GPT-4 , Streamlit, docker. Cloud Technologies

Data Collection and Preprocessing

Source and Nature of Data

- Data sourced from YouTube cooking videos and Kaggle/ scraped recipe websites.

Steps for Data Collection

- Users manually input YouTube URLs, web scraping using Python libraries (Requests, BeautifulSoup)/kaggle.

Data Preprocessing Techniques

- Text extraction using Whisper, cleaning, and validation with Pydantic.

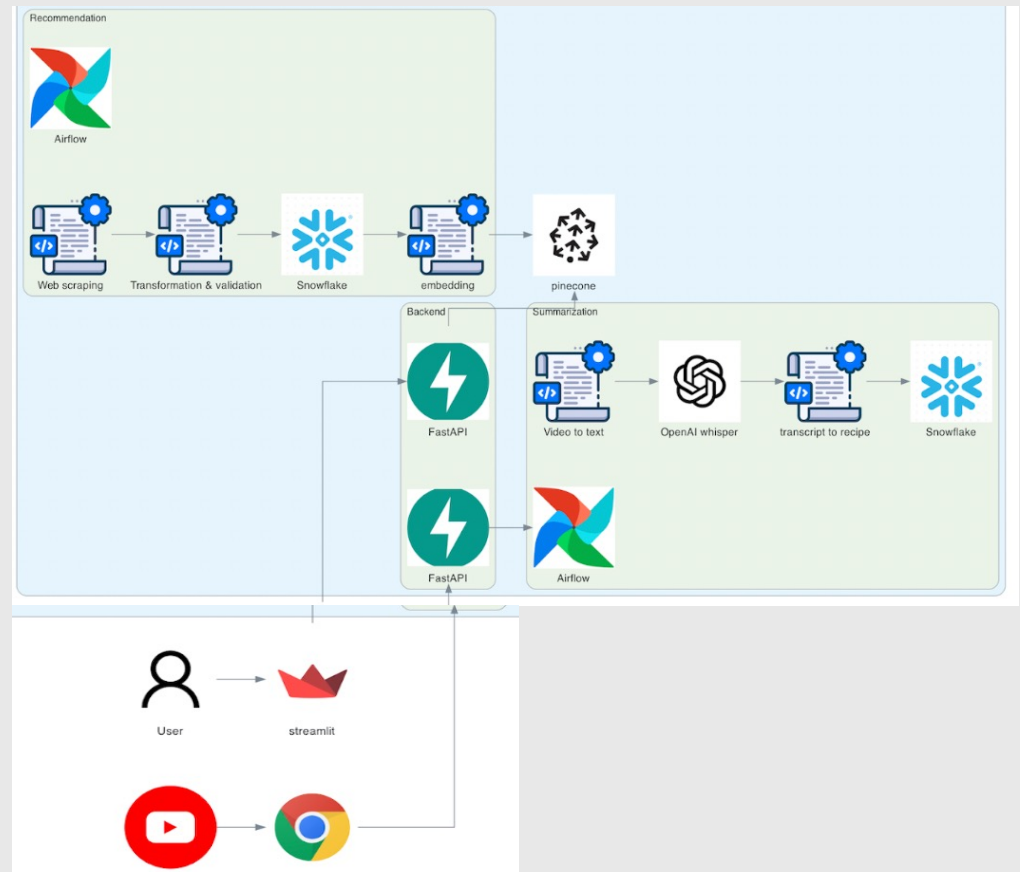# RAG Pipeline Implementation

Overview of the RAG Pipeline

- FoodWizard uses Retrieval-Augmented Generation to enhance the quality of recipe recommendations.

Implementation Steps

- Data Retrieval: Fetch video and recipe data.

- Processing: Whisper converts speech to text, GPT- summarizes the text.

- Embedding Generation: Recipe data is embedded using OpenAI Embeddings API.

Challenges and Solutions

- Challenges: Handling diverse video content and ensuring accurate summarization.

- Solutions: Fine-tuning models and improving preprocessing techniques.

Performance Metrics

Key Metrics

- Accuracy of video summarization.
- Relevance and personalization of recipe recommendations.

Methods to Calculate Metrics

- User feedback surveys, comparison with original video content.

Initial Results and Observations

- Preliminary tests show high accuracy in summarization and relevant recommendations.

Methods to Improve Metrics

Strategies for Improvement

- Fine-tuning NLP models for better accuracy.

- Enhancing preprocessing steps to improve data quality.

Planned Enhancements

- Implementing more robust text cleaning methods.

- Refining recommendation algorithms for better personalization.

Expected Impact

- Improved user satisfaction and more accurate recipe recommendations.

Deployment Plan

Deployment Steps

- Provide a local setup guide for users to install and run FoodWizard on their machines.

Tools and Platforms

- Docker for containerization to ensure consistent local deployment.

User Testing and Feedback Plan

- Initial rollout to a select group of users, gather feedback, and make iterative improvements.

Future Work

Potential Extensions and Improvements

- Support for more languages, expanding the scope to other platforms.

Long-term Vision

- Evolve FoodWizard into a comprehensive, user-friendly recipe management tool.

Further Development Beyond the Course

- Continuous updates, feature additions, and community engagement for feedback and improvement.

Conclusion

Summary of the Project

- FoodWizard simplifies the process of discovering and managing recipes from YouTube videos through local summarization and personalized recommendations.

Key Takeaways

- Importance of local langauge solutions and user-centric recommendation.

Final Thoughts

- FoodWizard has the potential to revolutionize the way users interact with cooking content, making it more accessible and personalized.

Q&A