



Intelligent API for Automated Profile Generation and Job Market Insights

Fall 24 CSCE 689 Programming Large Language Models

Course Project

Made By: Omar Khater

Introduction

Problem Statement

- The client aims to develop a social media app to connect creative professionals with opportunities. Think about this platform as LinkedIn, Indeed, or Upwork combined with Instagram. Similar existing tools are Behance.
- Many creative professionals struggle to create compelling profiles, which can reduce their visibility and job opportunities.
- In the current app implementation, they need to fill many text fields such as an elevator pitch and projects descriptions among others
- This is potentially a time-consuming process. Also, they need to be aware of the current demand on the job market so that they add more desired keywords to be shown on search results



Project Goals

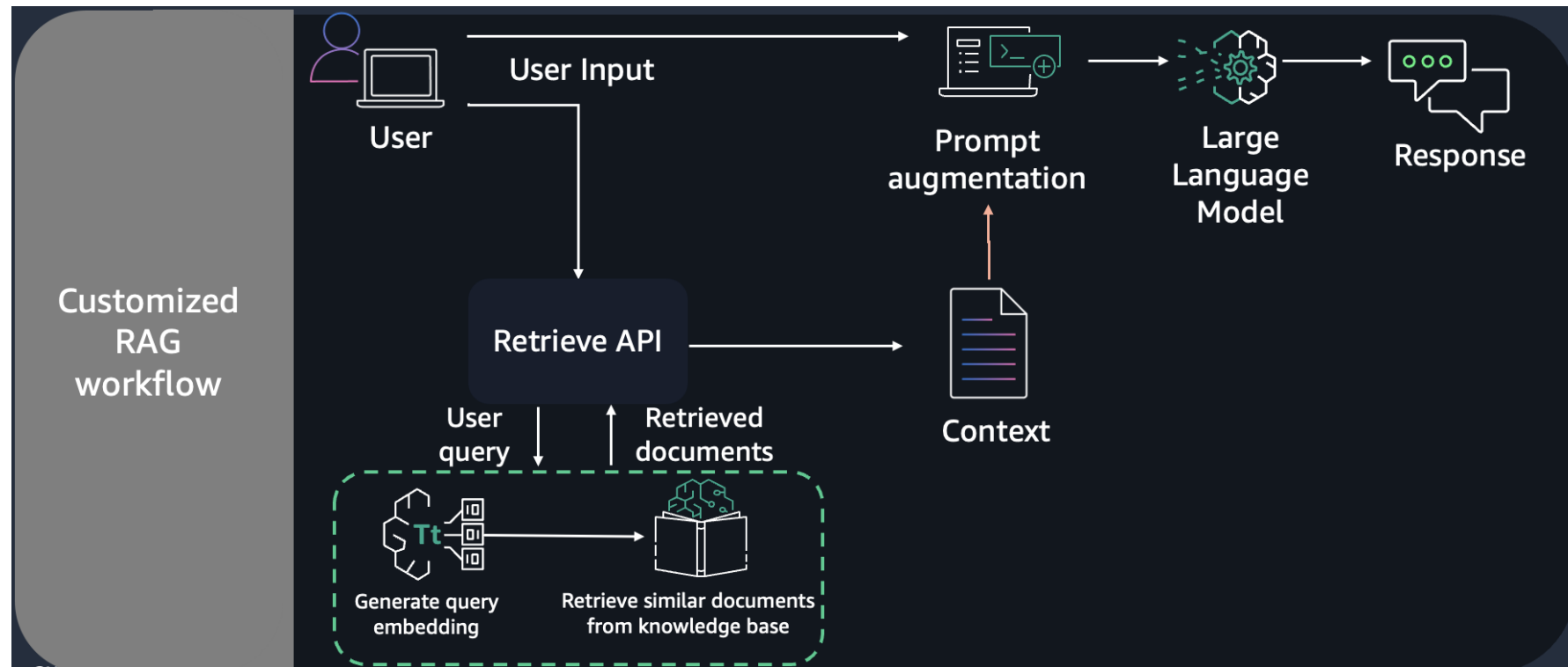
Proposed Objectives

- Develop an API that generates professional and engaging profile descriptions based on given context (e.g., other profile elements) and current market demands, utilizing pre trained LLMs. Special attention will be given to the prompt engineering techniques used in this process as well as handling existing context (e.g., user projects, images, trending keywords, ...etc.)
- Adhere to Test Driven Development (TDD) and Software Development Life Cycle (SDLC) best practices to ensure a robust, maintainable API.

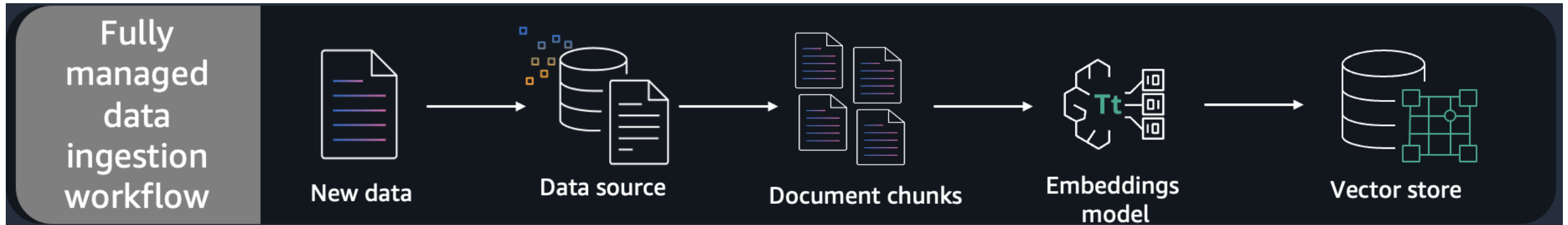


Methodology

Customized RAG workflow



RAG Data Ingestion



AWS Workshops. Amazon bedrock workshop, 2024. Accessed: 2024-12-05.

Data Collection

- ‘build_job_skills_datasets.py’:

fetches trending skills for job titles by scraping online sources. The data is organized into a structured data set, associating each job title with its relevant skills

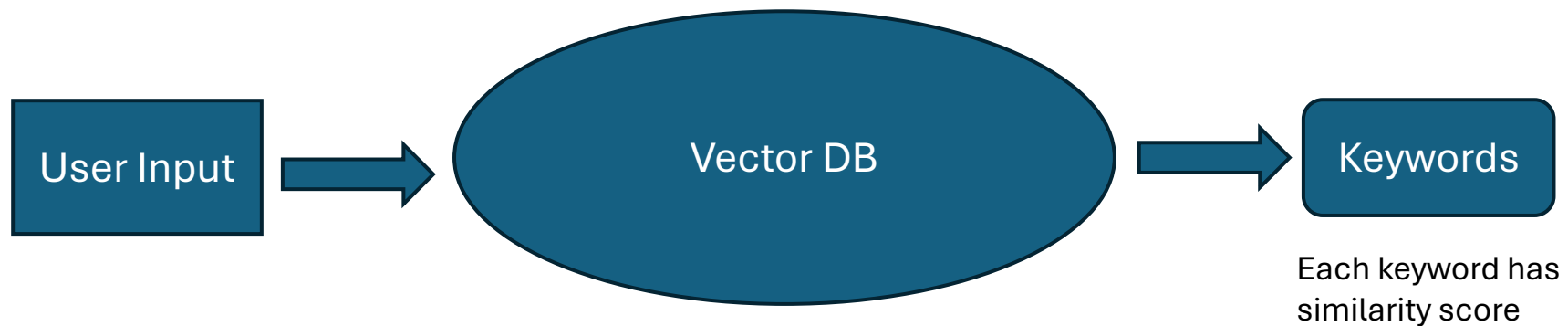
- ‘build_job_skills_database.py’:

converts this dataset into a vector database using embeddings generated by the Ollama model. The database allows for similarity-based retrieval by leveraging vector representations of the user input (e.g., profession, experience level)

Design Choices

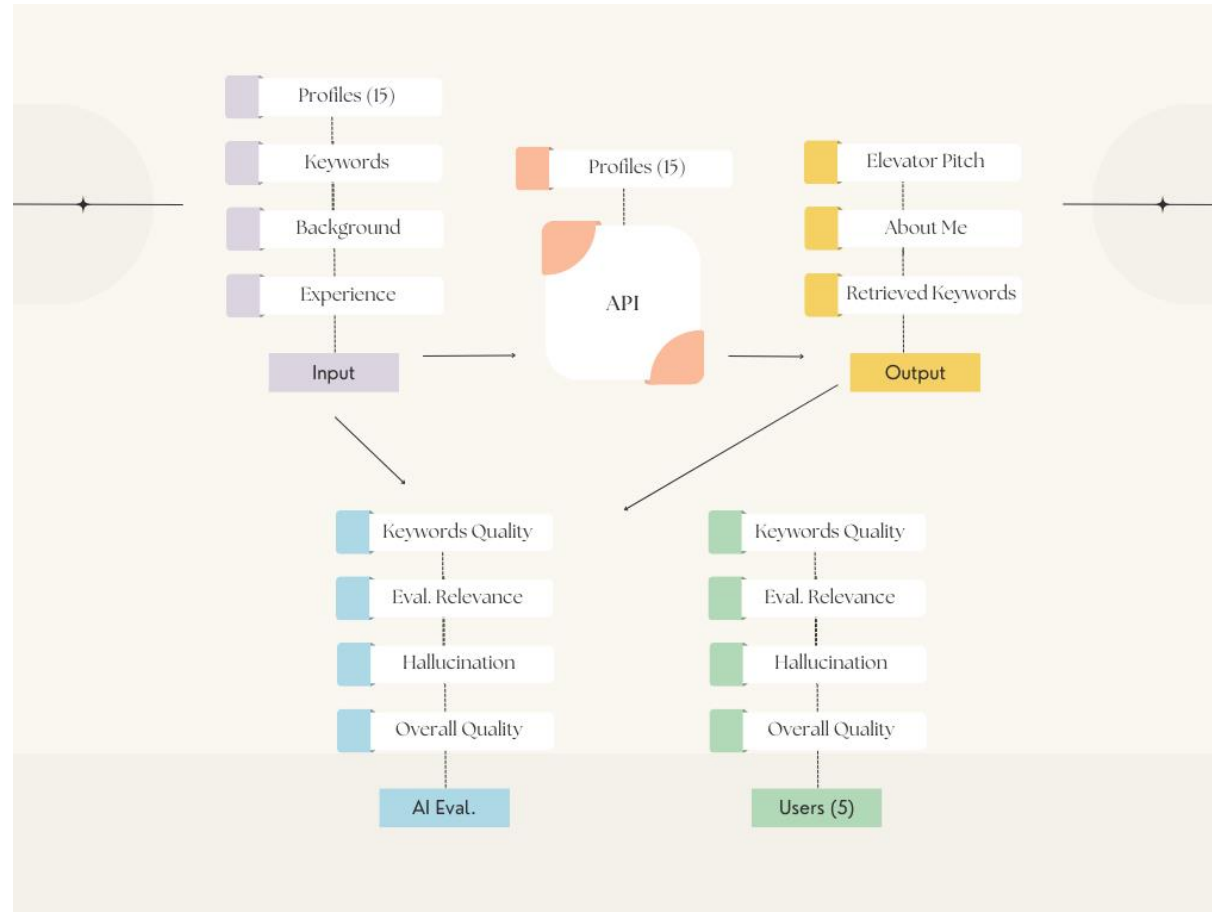
- Similarity Score to control the tolerance on the relevancy between the user input and retrieved query.

$$\textit{Relevance Score} = \frac{1}{1 + \textit{similarity score}}$$



Evaluation

Flowchart





Demo 1

Simple UI Usage

Sample UI Screenshots

Social Media Profile Upgrade

Use AI to craft a compelling social media profile tailored to your profession and goals.

Upgrade Your Profile

Profession:

Machine Learning Engineer

Experience Level:

Junior

Keywords (optional):

AWS, Sagemaker, Airflow

Background (optional):

Graduated with Masters from Texas A&M. Have AWS cloud experience. Aim to work on top companies

Similarity Score Threshold (0-100):

9 Low threshold = Less relevant keywords

Generate Profile

Generated Profile

Elevator Pitch

As a machine learning engineer with a Masters from Texas A&M and hands-on experience in AWS cloud technologies, I am driven to apply my expertise to tackle complex challenges and drive innovation at top companies.

About Me

I am a dedicated and ambitious machine learning engineer who recently graduated with a Masters from Texas A&M. My experience with AWS cloud technologies, such as Sagemaker and Airflow, has equipped me with the skills to develop cutting-edge machine learning solutions. I am on a mission to leverage my capabilities to make a significant impact in the field of artificial intelligence and contribute to the success of leading companies.

Hide Retrieved Keywords

Texas A&M, AWS, Sagemaker, Airflow, machine learning engineer

Hide Reason

The elevator pitch and 'About Me' section highlight the individual's background as a recent graduate from Texas A&M with AWS cloud experience. The keywords such as AWS, Sagemaker, and Airflow are seamlessly integrated to showcase the relevance of the individual's skills and aspirations as a machine learning engineer aiming to work for top companies.

Back to Home

The slide features decorative curved lines in the corners. In the top-left and bottom-left corners, there are light green curved lines. In the top-right corner, there are light blue curved lines. These lines are layered and have a soft, ethereal appearance.

Demo 2

Integration with NXTFolio

Update Professional Details

Professional Specialization

Marketing

Professional Details

optional, but highly recommended for better match

0 / 200

About Me

Tell us what makes you unique and different, what are your hobbies and skills, etc.

Fashion-forward marketing guru based in CS, TX, with 5 years at Adobe.

Collaborated with top tech giants like Amazon, Meta, Google. Expert in social media

strategies and trendsetting campaigns.

Generate About Me

0 / 240

About Me generated successfully.

Social Media Handles

Temporary Deployment:

<https://bhill24nxtfolio-a255640ed261.herokuapp.com/>

Permanent Deployment:

<https://nxtfolio.herokuapp.com/>

NXTFolio Documentation:

GitHub:

<https://github.com/FashioNXT/NXTFolio>

Presentation:

https://www.youtube.com/watch?v=fwQdqHMS_KU

Conclusions

What We Have done!

- Successful API development & Evaluation
- Successful output delivery
- Special attention to LLM techniques such as RAG design, prompt engineering has been investigated

Next Steps

Future Directions

- AI based resume generator
- Multi-modal contextual advanced API



Thank You!