

Project ID:- Capstone_Project_HPPCS[01]

Project Name:- CV Creation using LLMs

Scope:-

The scope of the project is to create a professional resume out of user provided unstructured resume/documents using LLM chaining.

Model selection rationale

3 models have been selected for the project:-

Nomic-embed-text

This model is selected for embedding tokens. It is a high performance open embedding model with a large token context window.

Gemma3

Gemma is a lightweight multimodal and can process text and images. It excels in tasks like question answering, summarization, and reasoning. It fits our current requirements.

It is used in generating professional resumes/cv with RAG retriever and the original prompt as input.

Llama3.2

It is a small multilingual model. It performs well in summarization tasks.

It is chained twice, 1st to generate a summary of job posting and, then (2nd) use this summary as context and return the response with a matching resume/cv.

Data extraction pipeline

1. Data is extracted from 10 unstructured cv (pdf format) saved in the “data” folder under the “codebase” folder.
2. These pdfs are ingested by using pymupdf4llm to get markdown text.
3. Then this markdown text is chunked using MarkdownTextSplitter
4. These chunks are then used to create embedding and vector stores using OllamaEmbeddings.
5. Vector stores are persisted locally in the file system, so that next time when an application runs it does not have to create a vector store again for storing embedding. Embedding can be picked directly from the local vector store. This increases performance significantly.
6. Next RAG is used to enrich context to get a nice summary of a personalized resume. RAG retriever is obtained based on cosine similarity. Then retriever docs are obtained from the retriever with the original prompt question :- “Extract name, contact, education, experience, skills, achievements etc... from the resume.”
7. The prompt template is created with context received from the RAG, and the original question. Which then becomes an input to “gemma3” LLM. The LLM response has a nice summary of the resume.
8. Next a job posting prompt is created and fed to llama3.2 LLM. This is done to find a professional description of job posting.
9. The first model response (in point 7 above) becomes a context1, and the second model response (in point 8) as context2 and the original question, all are input to the 3rd LLM. This is done to find out the nicely summarized matching (with job posting) resume.
10. And finally all generated resumes are saved in the output folder in text format.

Prompt design

Prompt template is used to design prompt. This helps in passing one or more ‘context’ with a ‘question’. Also we can pass any ‘instruction’ as well.

Prompt template helps in dynamically replacing context and question.

Prompt are designed carefully for example :-

- 1) The prompt question is :- “Extract name, contact, education, experience, skills, achievements etc... from the resume.”

—Though it covers everything, it is still helpful to let LLM focus on these points only.

- 2) The instruction given is: - “You are a helpful AI assistant. Answer ONLY from the provided pdf context. If the context is insufficient, just say you don't know.”

— It helps LLM not to hallucinate.

- 3) Job posting prompt: - “Looking for experienced JAVA Software Engineer with Bachelor’s Degree in Computer Science.”

—It helps LLM to generate an elaborate summary of experienced engineers to have JAVA and its related tech stack.

—In turn it helps in matching right resume with the job posting

Overall results

The final generated resume is nicely summarized as per the matching job posting

If a resume doesn’t match with job posting. A note section at the end clearly says there is no match.

Analysis

We can compare the original resume with the generated one.

—The generated/output one has clearly mentioned the **achievement** is a separate section.

—Also refactored nicely the job description for each company.

INPUT : -

Michael Rich

michael.rich@email.com
(555)123-4567
Edgar Springs, MO

Summary

Competent software engineer, able to work effectively in a fast-paced, agile environment, and passionate about developing software architecture for primarily web applications.

Experience

Software Engineer

BlueTech Software • Los Angeles, California

July 2019 - Present

- Researched and created a new application to be used by the company, resulting in a 1.3x increase in sales
- Created a new software development framework to develop applications faster and more efficiently
- Developed the process of testing and recording the results of the test, thereby increasing the number of tests completed per day by 10%
- Developed a new technique for reducing the time it takes to fix crashes by 20%

Web Developer

Mezzanine • Los Angeles, California

May 2018

- Developed a collaborative environment for all team members, creating a strong sense of community and empowerment
- Designed a new web application to increase collaboration among design, engineering and sales teams, resulting in a 10% increase in revenue in one quarter
- Built a custom web application for a major client, successfully delivering an integrated CRM system in just 2 weeks
- Maintained a clean, professional and creative web presence for the company to convey the professional image of the organization
- Used Adobe InDesign to design, edit and layout the company's print & digital collateral

Software Engineer

Geeks 4 Nerds • Los Angeles, California

October 2016

- Designed and implemented a new cloud-based mobile POS platform, resulting in a 50% increase in customer retention
- Collaborated with hardware and software development teams to ensure seamless integration of the new POS system
- Continued to develop specialty skills related to his expertise in mobile POS and payment technologies
- Developed and continuously improved an internal knowledge base of best practices for software development

Skills

C, Java, Sdlc, Software Development, Linux, C#, Communication Skills

Education

Bachelor's Degree in Computer Science

Zirkel College • Los Angeles, California

OUTPUT: -

Here's the extracted information:

****Name:** Michael Rich**

****Contact:****

* Email: michael.rich@email.com

* Phone: (555)123-4567

* Location: Edgar Springs, MO

****Education:** Bachelor's Degree in Computer Science**

****Experience:****

1. ****BlueTech Software****

* Los Angeles, California (July 2019 - Present)

+ Researched and created a new application, resulting in a 1.3x increase in sales.

2. ****Geeks 4 Nerds****

* Los Angeles, California (October 2016)

+ Designed and implemented a new cloud-based mobile POS platform, resulting in a 50% increase in customer retention.

3. ****Mezzanine****

* Los Angeles, California (May 2018)

+ Developed a collaborative environment for all team members.

+ Designed a new web application to increase collaboration among design, engineering and sales teams, resulting in a 10% increase in revenue in one quarter.

+ Built a custom web application for a major client, successfully delivering an integrated CRM system in just 2 weeks.

****Skills:****

* C

* Java

* SDLC

* Software Development

* Linux

* C#

****Achievements:****

* Increased sales by 1.3x at BlueTech Software

* Increased customer retention by 50% at Geeks 4 Nerds

* Increased revenue by 10% at Mezzanine

* Successfully delivered an integrated CRM system in just 2 weeks for a major client
