

CAREER-HY: RAG-BASED CAREER RECOMMENDATION SYSTEM

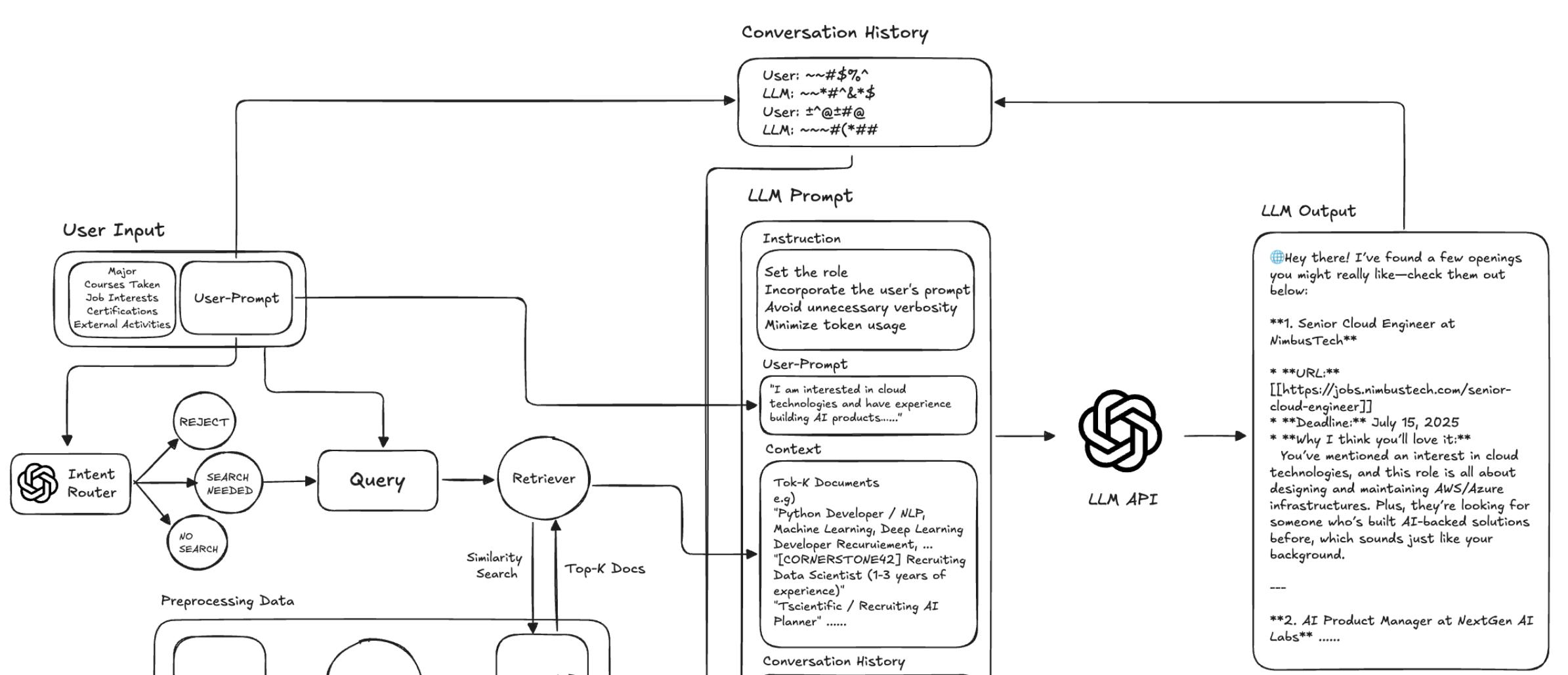
RESEARCH MOTIVATION

University students often struggle to identify career paths that align with their academic history and personal interests.

Traditional keyword-based search cannot capture these individual differences, making it difficult to identify which job postings truly match a student's background.

We propose a **RAG-based recommendation system** that retrieves job opportunities aligned with each **student's personal profile** and generates **explainable, tailored career suggestions**.

RAG PIPELINE



- Data Processing:** Collect documents (Saramin job-posting PDFs, Hanyang University course catalog)
- Section Parsing:** Segment each document into meaningful chunks (duties, skills, qualifications) using Job Post Parser.
- Vector Storage:** Embed all chunks and store them in ChromaDB as a vector database for efficient similarity-based retrieval.
- RAG Inference:** Retrieve the top-10 postings using the student's profile, rerank them with the user query to select the top-3, and use these as grounded context for personalized LLM recommendations.

EVALUATION

- Baseline:** Embeds the entire document text as a single unit
- Section Chinking:** Segments documents based on explicit section types (e.g., Responsibilities, Preferred, qualifications)
- Section + Recursive (Hybrid):** Applies Recursive Character Text Splitter (Chunk size: 500 tokens/ Overlap: 70 tokens)

RETRIEVAL PERFORMANCE

Metric	Baseline	Section Chunking	Section + Recursive
NDCG@10	0.2205	0.2591	0.2547
MRR@10	0.4227	0.4606	0.4468
Precision@3	0.2479	0.2308	0.2350

GENERATION PERFORMANCE

Metric	Baseline	Section Chunking	Section + Recursive
Recommendation Quality	4.2	4.2	4.3
Personalization Score	4.5	4.5	4.4
Response Helpfulness	4.4	4.2	4.3
Profile Alignment	4.0	4.0	4.1

Final Decision Based on the evaluation, we implemented Section Chunking.
It proved to be the optimal method, achieving the best retrieval accuracy (NDCG@10: 0.2591) compared to other approaches.

RESULTS & SYSTEM DEMO

The screenshot shows the system's user interface. At the top, there are search and filter options. Below that, a list of job postings is displayed, each with a snippet of text and a "View Details" button. The postings include titles like "CORNELSTONE42 Data Scientist (1~3년차 모집)", "Python 개발자 / 자연어처리(NLP)", and "(주)에이피씨 딥러닝 마신비전 및 LLM 전문가 채용". Each posting has a "View Details" button.

Our system provides personalized career counseling and recommends the **top-3 job postings** tailored to the user's profile. It offers **specific reasons** for each recommendation alongside **practical field tips** to enhance job application strategies.

CORE TECHNOLOGIES

- Frontend: React, Next.js
- Backend: FastAPI, LangChain
- Database
 - Vector DB: ChromaDB
 - RDBMS: MySQL
 - Object Storage: AWS S3
- Data Processing: PyMuPDF
- Deployment: Docker