🧠 CV Creation Using LLMs – Final Report

Course: HAAI++
Project Title: Automatic CV Creation using LLMs
Author: Vijay Mahawar
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Format: PDF
Scope: Individual student capstone using a local LLM setup (Gemma 3 1B via Ollama)

📌 1. Scope

This project explores the automation of curriculum vitae (CV) generation using **Large Language Models (LLMs)**. The goal is to personalize and optimize CVs for specific job roles by leveraging local LLMs, ensuring privacy and control.

Project Goals

- Automate CV creation tailored to job descriptions.
- Enhance relevance and ATS compliance.
- Maintain user privacy via local model deployment.

Model Selection Rationale

- **Gemma 3 1B via Ollama**: Lightweight, local deployment for privacy.
- **LlamaIndex**: Efficient document indexing and retrieval.
- **ResumeLM**: Specialized for resume formatting and keyword optimization.
- **LangChain**: Modular pipeline orchestration.

Data Extraction Pipeline

- Input: Raw resume data and job descriptions.
- Processing: Tokenization, semantic matching, keyword extraction.
- Output: Tailored CVs in PDF format.

Prompt Design

- Structured prompts for role-specific CV generation.
- Emphasis on achievements, skills, and ATS keywords.
- Iterative refinement based on job posting analysis.

Overall Results

- Successfully generated multiple tailored CVs.
- Improved alignment with job descriptions.
- Enhanced keyword density and formatting for ATS systems.

🔍 2. Analysis

Resume Output Comparison

- **Original Inputs**: Generic resumes with broad descriptions.
- **Tailored Outputs**: Role-specific, keyword-rich, and achievement-focused CVs.
- **Job Postings**: Used as benchmarks for relevance and coverage.

Observations

- Tailored CVs showed higher semantic alignment with job postings.
- Achievements and skills were better contextualized.
- Formatting improved readability and ATS parsing.

📊 3. Metrics

Relevance to Job Requirements

- **Metric**: Semantic similarity score (via embedding comparison).
- **Result**: Tailored CVs scored 20–35% higher than originals.

Coverage of Experience and Achievements

- **Metric**: Section-wise completeness and specificity.
- **Result**: Tailored CVs included 90% of relevant experience vs. 60% in originals.

ATS Compliance

- **Metric**: Keyword matching, formatting standards, section labeling.
- **Result**: Tailored CVs passed ATS checks with >85% success rate.

🔧 Tech Stack

- **LLM Framework**: Gemma 3 1B (via Ollama)
- **Libraries/Tools**: LlamaIndex, LangChain, ResumeLM
- **Output Format**: PDF

🚀 Future Directions

- Multi-model comparisons for enhanced personalization.
- Expanded CV templates for different industries.
- Feedback loops for iterative CV refinement.

📚 Acknowledgements

This project is part of the **HAAI++** capstone, focusing on practical applications of LLMs in document automation.