GenCV

Overview:

This project presents a web-based application for the automated generation of professional resumes and personalized cover letters, leveraging state-of-the-art Large Language Models (LLMs) running locally via Ollama. The system is designed to streamline and democratize the document creation process for job seekers, ensuring high-quality, ATS-friendly outputs tailored to individual user profiles and target job descriptions.

Motivation and Problem Statement:

Traditional resume/cover letter creation is manual, time-consuming, and often yields sub-optimal results for roles requiring precise formatting and personalization. Furthermore, many users lack the expertise to write compelling content that both impresses recruiters and passes automated screening systems. Existing online tools tend to be generic or require cloud-based services, raising privacy concerns and limiting adoption in resource-constrained settings.

Solution Approach:

Our solution integrates a modern, user-friendly web frontend (built in Next.js and React) with locally hosted LLMs via Ollama. Users input their relevant details—such as name, contact, skills, experience, education, and job preferences—through a dashboard interface. Upon submission, these details are combined into a structured prompt, precisely engineered to guide the AI model in generating a fully completed, ATS-optimized resume and cover letter.

Key Features:

➢ **End-to-End Automation:** From user input to downloadable documents.
➢ **Data Privacy:** All data is processed locally; no information leaves the user's device.
➢ **Custom AI Prompting:** Advanced prompt engineering ensures outputs replace all placeholders and use real data, eliminating the need for manual editing.
➢ **Professional Formatting:** Generated documents match modern resume styles with clear section headers, bullet points, and clean typography for maximum recruiter impact.
➢ **Model Flexibility:** Supports TinyLlama, Mistral, Llama2, Phi-2, and others, allowing adaptation for different resource profiles.

Implementation Details:

➢ **Frontend:**
Implements responsive forms for user input collection, and a results page for output display and PDF export. Real-time feedback and editing are supported, with relevant fields prefilled and context-aware.
➢ **Backend / AI Integration:**
Utilizes Ollama to run local language models. Upon data submission, a carefully crafted

prompt is sent to the LLM endpoint, instructing it to fill all resume and cover letter sections with user-supplied data. Output is post-processed to remove any residual placeholders and formatted for clean presentation.

➢ **Output Generation:**
Both resume and cover letter are rendered with headings, bullets, and logical flow. A PDF generation module ensures easy download and direct transfer to job portals. The results prevent errors where models might otherwise leave template instructions or blank sections.

➢ **Evaluation and Scope:**
The application was tested using multiple models and prompt variations to ensure highest output quality. A strong prompt example-driven approach outperformed template-based designs, especially for small models.

➢ **Limitations:**
TinyLlama and Phi-2 may produce shorter and less context-rich documents than Mistral or Llama2, but are efficient for offline demonstrations and educational settings.

➢ **User Experience:**
The solution empowers users to effortlessly create polished application documents, adaptable to different roles or industries.