Project Description and Purpose

This project is an **AI-powered Resume Optimizer** built with Next.js. Users can input a job description and their resume, and the app uses AI models to generate a tailored, ATS-friendly resume optimized for the job. The system highlights keyword optimization, provides improvement suggestions, calculates a match score, and allows users to save results to both MongoDB and Supabase for analytics and persistence.

Technologies Used

- **Frontend:**
  - Next.js (App Router, TypeScript)
  - React (functional components, hooks)
  - Tailwind CSS for styling
  - shadcn/ui component library
  - Lucide React for icons
  - jsPDF for PDF export
- **Backend/API:**
  - Next.js API routes (app/api/generate-resume/route.ts,app/api/save-resume/route.ts)
  - @xenova/transformers for free, local AI model inference (summarization, text2text-generation)
  - MongoDB for storing resumes and job descriptions
  - Supabase for user authentication and metadata storage
- **Other:**
  - ESLint, Prettier, TypeScript, PostCSS
  - Vercel for deployment

Challenges Faced and Solutions

1. AI Integration (Cost & Deployment)

- **Challenge:** Many AI APIs (OpenAI, HuggingFace Inference) are paid or have strict limits.
- **Solution:**
    - Integrated @xenova/transformers for free, on-device inference.
    - Used models like distilbart-cnn-6-6 and bart-large-cnn for summarization and resume tailoring.
    - Implemented fallback logic: If the main model fails, an alternative model or a keyword-based enhancement function is used.

2. Vercel Deployment Issues

- **Challenge:** Running heavy AI models/server-side code on Vercel can cause cold start delays or memory issues.
- **Solution:**
    - Kept model loading logic cached and lightweight (see let summarizer: SummarizerFunction | null = null; in app/api/generate-resume/route.ts).
    - Provided a fallback resume enhancement function that does not require AI inference, ensuring the API always responds even if the model fails to load on Vercel.

3. Keyword Extraction & Resume Structuring

- **Challenge:** Extracting relevant keywords and restructuring resumes for ATS compatibility.
- **Solution:**
    - Custom keyword extraction logic (extractKeywords) filters out common words and prioritizes technical terms.
    - Resume parsing and reconstruction functions (parseResumeIntoSections, reconstructResume) ensure output is well-formatted and sectioned.

4. Data Persistence & User Management

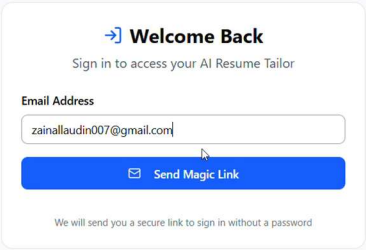
- **Challenge:** Storing user data securely and linking resumes to users.
- **Solution:**
    - Used Supabase for authentication and metadata.
    - Used MongoDB for storing large text data (resumes, job descriptions).

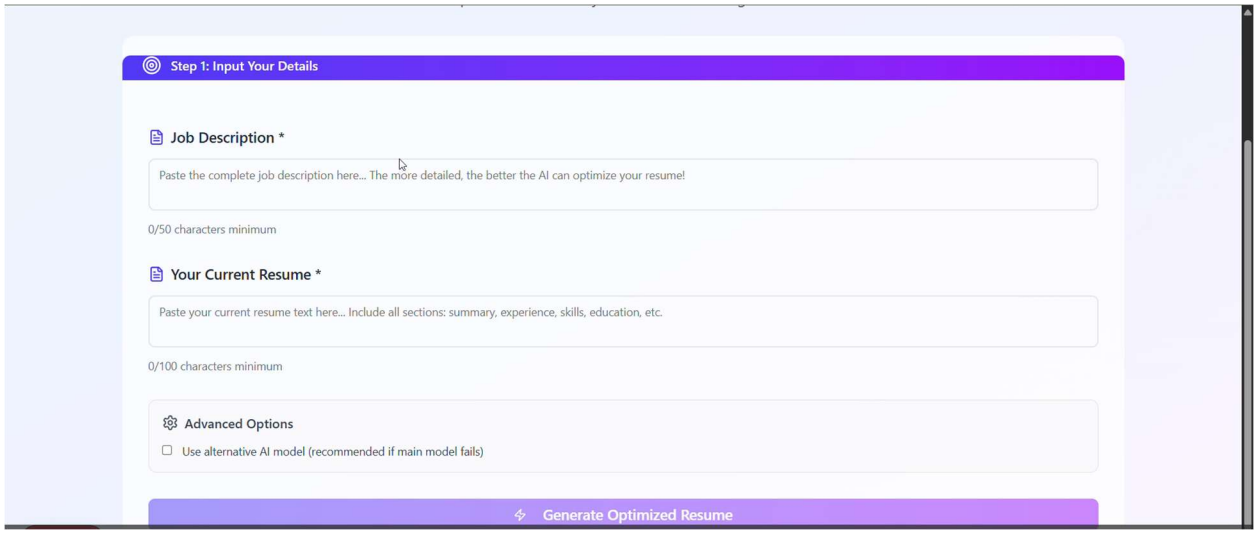
- API endpoints (app/api/save-resume/route.ts) handle saving to both databases and extracting job/company info for analytics.

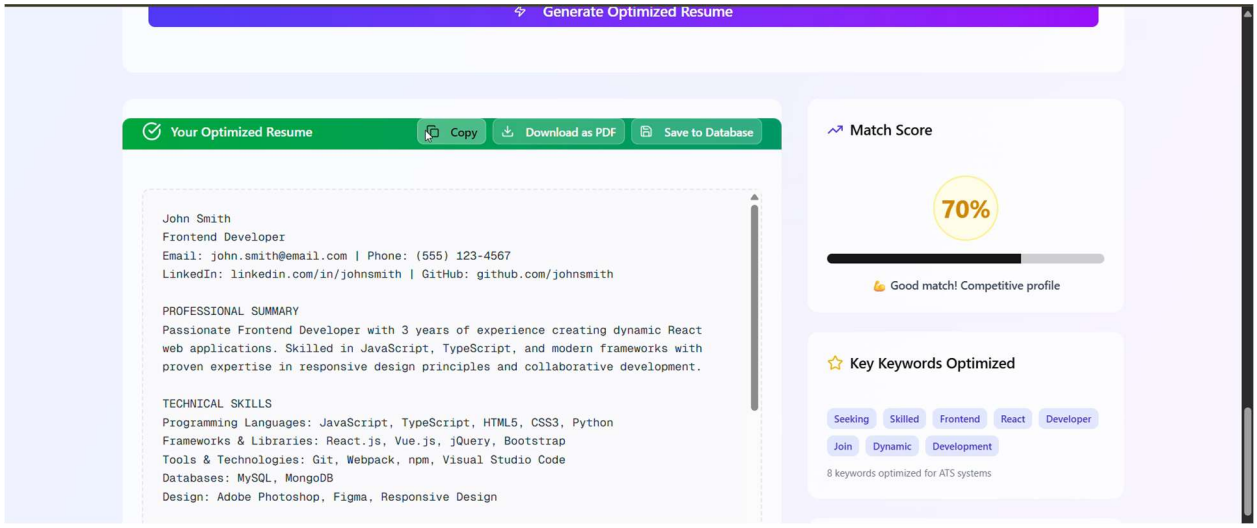
Summary

I built a robust, full-stack AI resume optimizer using free, open-source AI models to avoid paid API costs, with careful handling of deployment and reliability challenges on Vercel. The system is user-friendly, secure, and designed for real-world ATS optimization.

Key Features




Step 1: Input Your Details
Job Description *
Paste the complete job description here... The more detailed, the better the AI can optimize your resume!
0/50 characters minimum
Your Current Resume *
Paste your current resume text here... Include all sections: summary, experience, skills, education, etc.
0/100 characters minimum
Advanced Options
Use alternative AI model (recommended if main model fails)
Generate Optimized Resume


Generate Optimized Resume
Your Optimized Resume
Copy
Download as PDF
Save to Database
John Smith
Frontend Developer
Email: john.smith@email.com | Phone: (555) 123-4567
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PROFESSIONAL SUMMARY
Passionate Frontend Developer with 3 years of experience creating dynamic React web applications. Skilled in JavaScript, TypeScript, and modern frameworks with proven expertise in responsive design principles and collaborative development.
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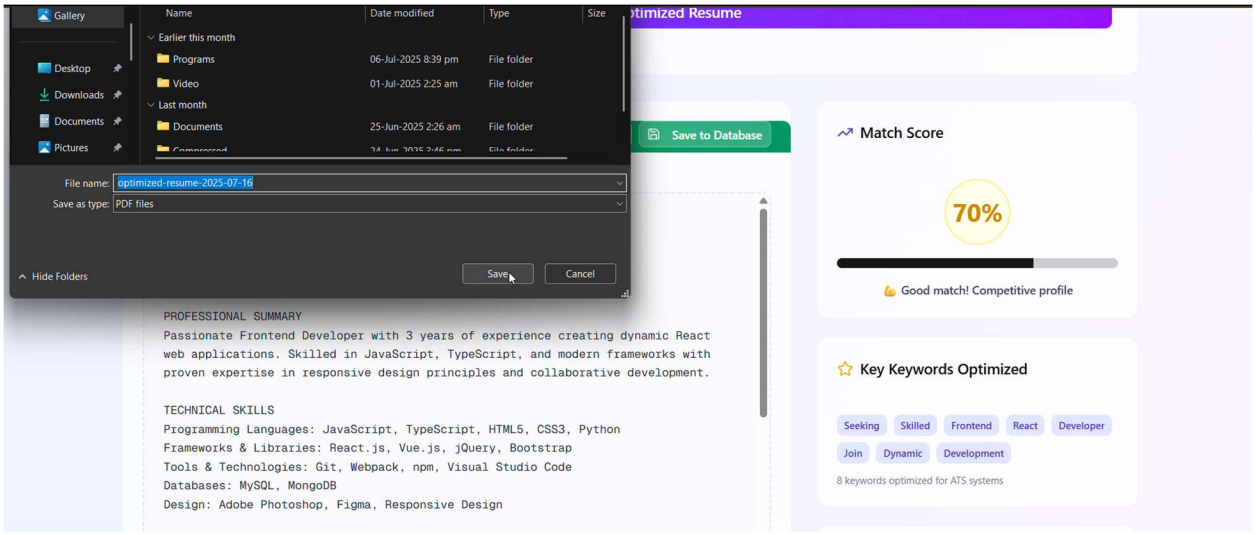
Tools & Technologies: Git, Webpack, npm, Visual Studio Code
Databases: MySQL, MongoDB
Design: Adobe Photoshop, Figma, Responsive Design
Match Score
70%
Good match! Competitive profile
Key Keywords Optimized
Seeking
Skilled
Frontend
React
Developer
Join
Dynamic
Development
8 keywords optimized for ATS systems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Match Score
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Good match! Competitive profile
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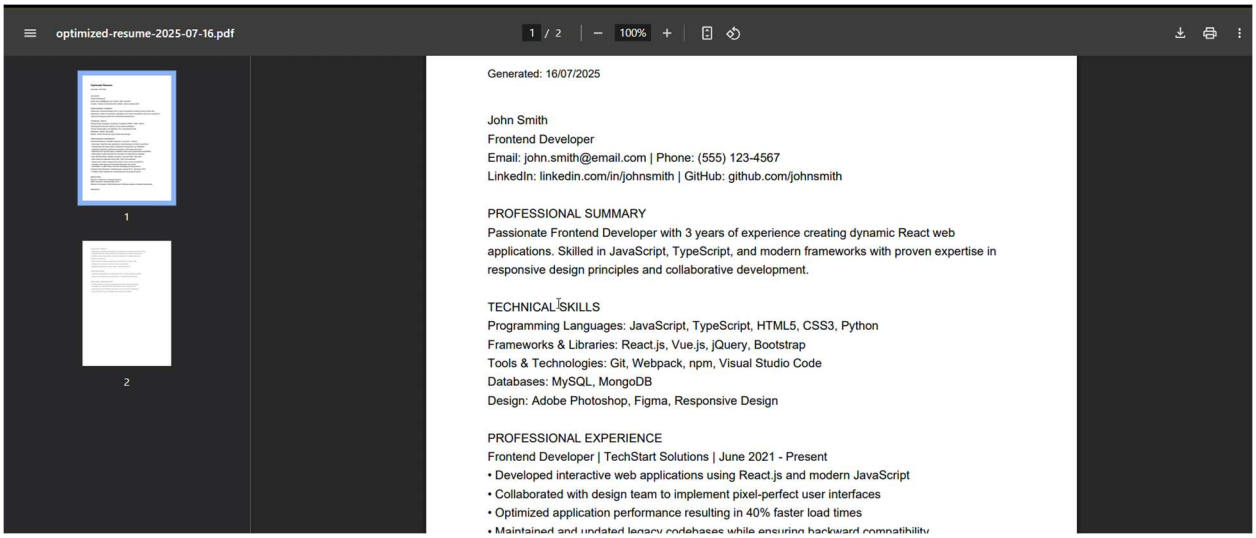
Design: Adobe Photoshop, Figma, Responsive Design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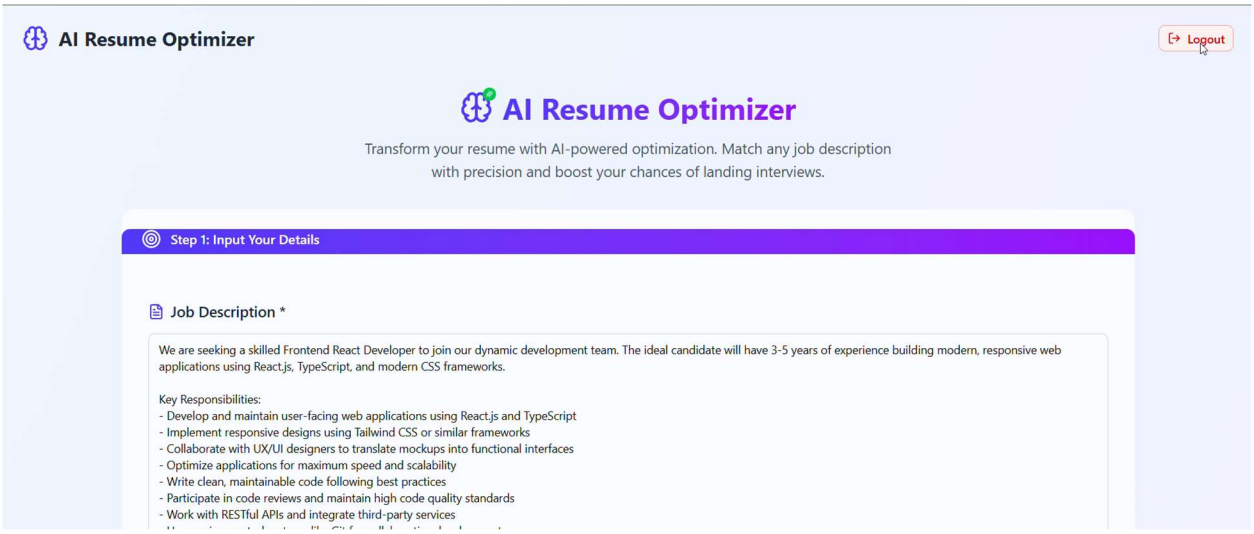
Tools & Technologies: Git, Webpack, npm, Visual Studio Code
Databases: MySQL, MongoDB
Design: Adobe Photoshop, Figma, Responsive Design
PROFESSIONAL EXPERIENCE
Frontend Developer | TechStart Solutions | June 2021 - Present
• Developed interactive web applications using React.js and modern JavaScript
• Collaborated with design team to implement pixel-perfect user interfaces
• Optimized application performance resulting in 40% faster load times



Links

- **GitHub**

  https://github.com/MianZainAllaudin/Nexium_ZainAllaudin_GrandProject

- **Vercel**

  https://airesumeoptimizer.vercel.app/

- **Working Demonstration (Video)**

  https://github.com/MianZainAllaudin/Nexium_ZainAllaudin_GrandProject/blob/main/Video.mp4