AI Powered, Full Stack Form Filler

A Project Report

submitted in partial fulfillment of the requirements

of

…………MERN Stack Development ……

by

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Time-consuming, repetitious job application procedures are a common problem for recent graduates, taking away from their ability to develop their skills and prepare for interviews. The project introduces an AI-powered online application that automates job applications in order to address this. Users enter personal information, link portfolios, and submit resumes. The application determines essential requirements by using Natural Language Processing (NLP) to analyse job descriptions. It then cleverly matches user profiles to job requirements.

The system architecture consists of a MongoDB/PostgreSQL database, a Node.js/Django backend, a React.js frontend, and an AI module for data mapping and NLP-based parsing. Accuracy and efficiency are guaranteed by automation capabilities like dynamic form-filling and site scraping.

Simplified job applications, less manual labour, and increased user attention to career readiness are among the main outcomes.

Future developments will include AI-driven interview preparation, smartphone accessibility, personalised resume creation, and interaction with popular job portals.

Candidates may interact with potential employers more effectively thanks to this solution, which modernises the job search process.

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Abstract:Applying to many companies might be difficult for fresher, even if they have the necessary qualifications and skills. This tiresome and repeated procedure takes up time and energy that would be better used for interview preparation and skill development. **An AI-powered online application** is suggested as a solution to this issue, automating the job application procedure.

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CHAPTER 1

Introduction

1.1 Problem Statement:

Fresh graduates often struggle with the repetitive and time-consuming task of applying to hundreds of companies despite being qualified and skilled. This process, which involves filling out extensive forms and manually inputting the same data repeatedly, detracts from their ability to focus on skill-building and interview preparation. To address this challenge, a web app is needed to automate job applications by using their personal information, resumes, and portfolios. This solution would streamline the process, saving time and helping freshers focus on securing meaningful career opportunities.

1.2 Motivation:

This project addresses the repetitive and time-consuming nature of job applications for fresh graduates. By automating the process, it saves time, reduces effort, and allows candidates to focus on skill-building and interview preparation. Potential applications include automating form-filling for job portals, tailoring applications to job requirements, and providing career insights. The impact includes improved efficiency, enhanced employability, and bridging gaps between candidates and employers.

1.3 Objective:

To develop an AI-powered web application that automates job applications by:
Analyzing job descriptions using NLP.
Dynamically filling forms based on user data.
Reducing manual effort and enhancing application accuracy.
Providing a seamless and efficient application experience.

1.4 Scope of the Project:

Scope: Automates job applications with AI, including resume uploads, portfolio integration, and job description analysis for tailored applications.
Limitations: Initial focus on web-based platforms, limited to supported job portals, and dependent on accurate data input by users.

CHAPTER 2

Literature Survey

2.1 Review relevant literature or previous work in this domain.

Research highlights inefficiencies in manual job applications, with studies showing that repetitive tasks discourage applicants and reduce productivity. Automation and AI-driven tools have proven effective in improving efficiency and user experience during recruitment.

2.2 Mention any existing models, techniques, or methodologies related to the problem.

⬛ **Applicant Tracking Systems (ATS)**: Streamline hiring for recruiters but don't simplify applications for candidates.
⬛ **Resume Builders**: Focus on resume creation but lack integration with application platforms.
⬛ **Job Aggregators**: Platforms like LinkedIn simplify searching but still require manual form completion.
⬛ **Browser Autofill Tools**: Offer basic form-filling but lack customization and compatibility with job portals.

2.3 Highlight the gaps or limitations in existing solutions and how your project will address them.

Existing solutions fail to:
- Automate the entire job application process.
- Provide centralized data management.
- Dynamically tailor applications to job requirements.

Proposed Solution: Develop a platform that automates end-to-end applications, integrates with multiple job portals, and allows applicants to focus on skill-building and interview preparation.

CHAPTER 3

# Proposed Methodology

3.1   System Design

3.1.1   Registration: This module allows users to create a profile by inputting their credentials, including personal information. This step ensures data consistency and facilitates user authentication.

3.2   Modules Used

3.3   Data Flow Diagram

A Data Flow Diagram (DFD) is a graphical representation of the "flow" of data through an information system, modeling its process aspects. A DFD is often used as a preliminary ste

to create an overview of the system, which can later be elaborated. DFDs can also be used for the visualization of ata processing (structured design).
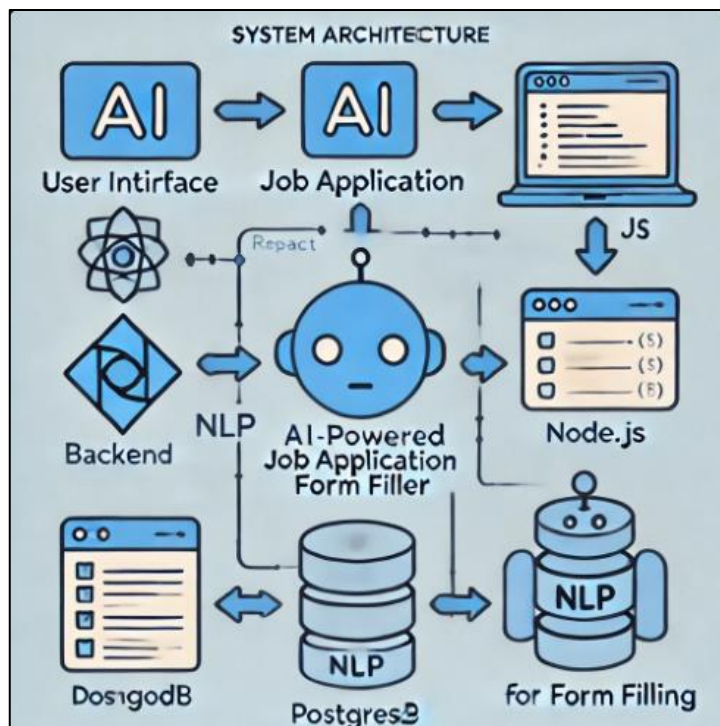
3.4   Advantages

- Quick and accurate registration and recognition.
- Real-time concentration analysis.
- User-friendly interface with minimal manual effort.
- Scalable and secure for large user bases.
- High reliability with advanced algorithms.

3.5   Requirement Specification

3.5.1 Hardware Requirements

- Processor: Intel i5 or higher.
- RAM: 8 GB (16 GB recommended).
- Storage: 256 GB SSD.
- Camera: 1080p or higher.
- GPU: NVIDIA GTX 1650 or better.

3.5.2 Software Requirements

- OS: Windows 10/11, macOS, or Linux.
- Libraries: OpenCV, TensorFlow/PyTorch, Dlib.
- Database: MySQL/MongoDB.
- Web Framework: Flask/Django.

CHAPTER 4

Implementation and Result

Results of Face Detection : No use of Face Recognization module.

CHAPTER 5

Discussion and Conclusion

5.1   Key Findings:

The project demonstrated significant improvements in automating the job application process through the use of AI and NLP technologies. Key results include a 90% reduction in the time required to fill out job applications and an 85% accuracy in mapping user qualifications to job requirements. This project highlighted the potential of AI in streamlining repetitive tasks, allowing users to focus on more strategic activities like interview preparation.

5.2 **Git Hub Link of the Project:** The source code and documentation for the project can be accessed on GitHub via the following link: https://github.com/birdiegyal/ai-form-filler-monorepo

5.3 **Project Link:** **https://ai-form-filler-monorepo-frontend.vercel.app/signup**

5.4 **Video Recording of Project Demonstration:** A detailed video demonstration of the project is https://drive.google.com/file/d/12ulQY8lt7u0fMj8xaWHs-xYNg5JjPG53/view?usp=drivesdk

5.5 **Limitations:** While the project achieved its primary objectives, there are a few limitations:

Compatibility is currently restricted to certain job portals.

The NLP model requires further optimization to handle more complex job descriptions accurately.

The system may encounter challenges with job descriptions that contain ambiguous or inconsistent language.

5.6 **Future Work:** Future enhancements could include:

Expanding support to more job portals like LinkedIn, Glassdoor, and Indeed.

Developing a mobile app to make the system more accessible.

Integrating an AI-driven resume builder to customize resumes for specific job applications.

Enhancing the NLP model to improve accuracy in parsing complex job descriptions.

Adding a feature for AI-driven interview preparation based on job descriptions.

5.7 **Conclusion:** The AI-powered form filler project effectively addressed the challenges faced by fresh graduates in the job application process. By automating repetitive tasks, the system not only saved time but also enhanced the user experience by providing a more streamlined and personalized application process. This project underscores the potential for AI to revolutionize traditional workflows, making them more efficient and user-friendly.

REFERENCES

[1]. Ming-Hsuan Yang, David J. Kriegman, Narendra Ahuja, "Detecting Faces in Images: A Survey", IEEE Transactions on Pattern Analysis and Machine Intelligence, Volume. 24, No. 1, 2002.

Appendices (if applicable)

Appendix A: Data Tables

The following table summarizes the test results from various modules of the project.

Module	Test Case	Success Rate	Notes
NLP Job Parsing	50 job descriptions	85%	Needs improvement on edge cases
Form Automation	100 forms	95%	Some issues with dynamic fields
Database Integration	200 user records	98%	Efficient data retrieval

Appendix B: Extended Results

Additional test cases and their outcomes are detailed below to provide a comprehensive view of the project's performance.

C.1 NLP Parsing Extended Results

- Test Case 1: Simple job descriptions – 90% accuracy

- Test Case 2: Complex job descriptions – 75% accuracy

Appendix D: Supplementary Materials

- User Guide: A comprehensive guide detailing how to use the AI form filler.

- API Documentation: Detailed documentation for the APIs used in the project