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AI-Powered Resume Crafting and Screening

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Abstract— In today's competitive job market, a resume often serves as the first point of contact between job seekers and recruiters. However, many job seekers, especially fresh graduates, struggle to craft a professional and ATS-friendly resume that clearly highlights their skills and experiences. At the same time, recruiters face the challenge of screening large volumes of applications, which is time-consuming and may result in qualified candidates being overlooked. To address these issues, this project develops Resume Pro, a web-based system that integrates AI-powered resume crafting and automated resume screening. The platform enables users to generate high-quality, ATS-friendly resumes with AI-driven suggestions, while recruiters can screen and rank applicants using natural language processing and machine learning techniques. The system is implemented using Python (Flask) for the backend and HTML, CSS, and JavaScript for the frontend. The delivered system is a user-friendly application that supports better resume preparation and improves efficiency and accuracy in the hiring process.

Keywords— AI Resume crafting, Resume Screening, Machine Learning, Natural Language Processing, ATS-Friendly Resume, Web-Based System, Python, AI suggestion

I. Introduction

Since we are in the digital era now, a lot of companies have started using the Applicant Tracking System (ATS) to help filter resumes which poses a new challenge for the candidates to create a good resume that will stand out and pass through these automated systems [1-4]. In addition, recruiters also need an efficient way to screen the candidates and pick the best fit candidates for the job.

Both job seekers and recruiters face a lot of challenges during the hiring process especially in today's competitive job market. Job seekers, especially fresh graduates, often struggle to make a resume that stands out mostly because they do not know what the recruiters are looking for. Because of that, many job seekers ended up using the most basic resume templates that did not highlight their abilities, strength or match it with the roles that they are applying for. Other than that, recruiters also face problems when reviewing the resumes because it takes a lot of time for them to manually review them.

This process slows down the entire hiring process and also raises the operating expenses. Furthermore, human screening tends to be inconsistent and biased which may cause qualified candidates to be unfairly passed over [4]. The process will also be tedious with the absence of intelligent tools to help match the candidate's skill with the job requirements.

This paper investigates current system requirements for resume crafting and candidate screening in environments increasingly influenced by Applicant Tracking Systems (ATS). Building on the identified needs and limitations of existing approaches, the study designs and develops an AI-powered platform that supports two primary user groups: job seekers, who can generate and refine personalized resumes, and recruiters, who can screen job applications more efficiently to identify candidates that best match the job requirements. The platform is subsequently tested to confirm core functionality and usability, ensuring the proposed solution is practical and reliable for real-world adoption.

II. Related Works

In ATS-influenced hiring, resume crafting becomes a machine-readability and matching problem as much as a writing problem such as candidates are pushed to use parse-friendly layouts and align terminology to the job description so their skills are not missed during automated parsing and scoring. The job-seeker side is strongest when a platform explicitly supports ATS-friendly resume building (for example, an AI-assisted builder) but can still be limited by template-only customization, which may not fit diverse roles and experiences. At the same time, research shows that resume–job matching can be improved by using embedding-based representations to better capture semantic similarity and reflect human evaluation preferences across domains [1].

From the recruiter side, screening is mainly a scale and consistency challenge. Systems typically parse resume text, extract features or skills, and apply ranking methods to shortlist candidates efficiently. One example in the literature uses text parsing, cosine similarity and KNN-based ranking to match CVs with job descriptions at volume, illustrating how pipeline-style screening is commonly operationalized [5]. Platforms oriented toward employers prioritize filtering or ranking and ATS-like workflows rather than helping candidates craft resumes. For instance, Hiredly's employer offerings describe AI-enabled application screening and resume summarisation and a built-in applicant tracking system, reflecting the emphasis on recruiter-side efficiency [6]. However, these automated approaches also raise governance concerns—bias and validity can depend heavily on data choices, prediction targets, and ongoing monitoring, and applicants' trust can differ depending on whether algorithms are used for resume screening [7].

Based on the feature comparison in Table 1, existing platforms tend to support either resume creation or employer-side screening, but rarely both in an integrated workflow. Info-Tech focuses mainly on job seekers, offering an AI-assisted resume builder and ATS-friendly output, however, its resume customization is limited to preset templates, and it does not provide screening tools for recruiters. In contrast, Hiredly and JobsLah place stronger emphasis on the employer or recruitment side by providing screening-related capabilities. However, their job-seeker features differ whereby JobsLah includes a built-in resume builder, while Hiredly does not offer an integrated resume builder or resume customization features for job seekers. This split creates a gap for users who need end-to-end support from crafting an ATS-ready resume to being evaluated fairly and efficiently through screening.

TABLE I
COMPARISON WITH EXISTING SYSTEM

FEATURES	INFO-TECH [8]	HIREDLY [6]	JOBSLAH [9]
Resume Builder	Yes, AI assisted	No, built-in resume builder	Yes, built-in resume builder
Resume Customization	Limited, only preset templates	Not available	Not available
ATS Compatibility (Builder)	ATS friendly	Not available	Not available
Resume Screening (Employer)	Not available	Yes, it uses smart filters to rank the applicants	Yes, it has ATS module with keyword-based filtering
AI/Keyword Filtering	Not for recruiters	For employers, matches profiles to job posts	For employers, it filters resumes by keywords
Target Users	Job Seekers	Job Seekers and Employers	Employers (HR teams only)
Strength	Easy resume building for job seekers	Fast and smart job matching for recruiters	End to end screening and recruitment for HR
Weakness	No tools for employers to screen resume	No resume builder	Template resume-driven

III. METHODOLOGY

The development approach selected for this project is the Agile Software Development Life Cycle (SDLC). Agile is an iterative and adaptive methodology that breaks development into smaller, manageable cycles, allowing features to be designed, implemented, tested, and refined progressively. This approach provides the flexibility needed to incorporate feedback, enhance functionality, and improve user experience throughout the project, making it well suited for a system that may require continuous adjustments and incremental improvements [10].

A. *Requirements Gathering*

The Agile software development life cycle begins with requirements gathering, where the project team identifies and defines the user needs and expectations for the system. In this phase, we analyse and compare existing resume crafting and screening platforms to understand current practices and common limitations. The missing or weak features identified from this comparison are then translated into system requirements, ensuring that the proposed platform addresses key gaps in current solutions and supports both job seekers and recruiters effectively.

B. *System Design*

Figure 1 illustrates the use case diagram for our system namely Resume Pro, which involves three main actors which are Job Seeker, Recruiter, and Admin. Both job seekers and recruiters can register and log in to the system, and they are able to upload job descriptions. A Forgot Password function is also provided to support account recovery when users cannot access their credentials. For job seekers, the system supports profile management, selection of resume templates, and resume editing, including AI-generated suggestions to improve content. Job seekers can then download the completed resume. Recruiters, on the other hand, can import resumes and view or compare screening results to support candidate selection. Finally, the admin is responsible for managing user accounts and monitoring system usage to ensure smooth operation and oversight.

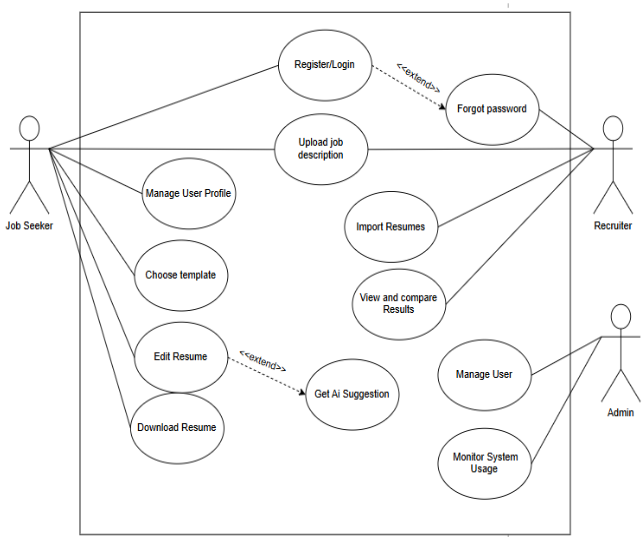


Fig. 1. Resume Pro Use Case diagram

C. Development

This project consists of two core modules which are resume crafting and resume screening. The web application is developed with HTML, CSS, and JavaScript for a user-friendly frontend interface, while Python (Flask) is used to implement backend services and API endpoints. MySQL serves as the database for storing user information, resume content, uploaded job descriptions, and screening results. To support AI-driven resume recommendations and automated screening, we explored suitable machine learning approaches based on resume–job matching tasks.

We initially searched for a dataset containing resume attributes such as education, skills, and work experience. The dataset was cleaned using Pandas by removing irrelevant columns, handling missing values, and combining relevant textual features into a unified text_data field. However, due to limited dataset availability and constraints for model training, the system relies on pre-trained transformer models from Hugging Face.

Two models were implemented for different stages of evaluation which are BERT, used as the primary feature extractor and classification baseline, and MiniLM-L6-v2, used as the ranking engine for resume–job description matching. BERT was fine-tuned using the skills and objective_career fields, first for general feature representation and then for binary suitability classification using a 0.7 match threshold to provide rapid initial screening. MiniLM-L6-v2 processes the job description and resume as a paired input to generate a compatibility score (0–100), enabling the system to rank candidates based on contextual similarity rather than simple keyword frequency. Following model integration, the frontend, backend, and database components are combined to complete the platform, and comprehensive testing and evaluation are performed to assess usability and real-world system performance.

D. Testing

This section describes the testing conducted on the web application to ensure it is ready for use and meets all specified requirements and functionalities. The evaluation includes unit testing, integration testing, system testing, and User Acceptance Testing (UAT) to verify both individual components and overall system performance.

The testing activity was carried out across three test phases and showed consistent success for all key features. Core workflows including user registration, login, job description submission, skill recommendation, resume PDF generation, and resume screening upload passed in every phase. In addition, validation and control cases such as invalid login attempts, adding skills via the skill button, and role-based redirection also passed throughout, indicating stable functionality and reliable system behaviour across repeated testing cycles.

TABLE II
TESTING ACTIVITY

Test Case Description	Test Phase 1	Test Phase 2	Test Phase 3
User Registration	✓	✓	✓
Login	✓	✓	✓
Submit Job Description	✓	✓	✓
Get Skill Recommendation	✓	✓	✓
Generate Resume PDF	✓	✓	✓
Resume Screening Upload	✓	✓	✓
Invalid Login Attempt	✓	✓	✓
Skill Button Add	✓	✓	✓
Role-Based Redirect	✓	✓	✓

E. Deployment

In this section, we document the development, implementation, and evaluation of Resume Pro, a web-based application that integrates AI for resume crafting and screening. The system is deployed using the Flask web framework, supported by MySQL for structured data management, and Hugging Face Transformers for the AI components. The application also underwent functional testing and User Acceptance Testing (UAT) to ensure that it operates reliably, produces accurate outputs, and supports timely interactions in real usage.

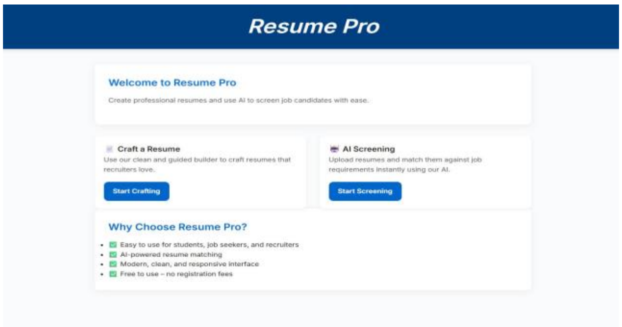
The frontend was developed using HTML, CSS, and JavaScript to deliver a clean and professional user interface. A consistent blue-and-white theme was applied across the application to maintain a uniform look and feel. Responsive design principles were implemented to ensure accessibility across different screen sizes. In addition, custom JavaScript was used to support file uploads and to display AI-generated skill recommendations dynamically without requiring page refreshes.

For the backend, Flask was used to provide a lightweight and efficient server environment, while MySQL manages stored data such as processed resume content, user credentials, and job descriptions. For the skill recommendation feature, a fine-tuned DistilBERT model was implemented for Named Entity Recognition (NER) using a custom-labelled dataset and the BIO tagging format to identify skills from raw text. For candidate ranking, the system uses the MiniLM-L6-v2 Sentence Transformer to perform semantic matching by encoding documents into 384-dimensional embeddings and computing cosine similarity, allowing candidates to be ranked based on contextual relevance rather than keyword frequency alone.

System integration connects the frontend interface, Flask backend, database, and both AI models into a unified pipeline. For resume screening, when a recruiter uploads a resume, the frontend sends the file to the backend, which triggers the MiniLM-L6-v2 model to compute a match score against the active job description. The screening results are stored in MySQL and returned to the frontend to update the recruiter's leaderboard. For resume crafting, when a user submits a job description, the fine-tuned DistilBERT NER model extracts explicit technical and soft skills from the text. The extracted skills are then used to query a skill map, enabling the system to recommend related skills that commonly co-occur with the identified ones.

IV. System Prototype

This section presents the user interface of Resume Pro and highlights its key features.



Welcome to Resume Pro

Create professional resumes and use AI to screen job candidates with ease.

Craft a Resume

Use our clean and guided builder to craft resumes that recruiters love.

AI Screening

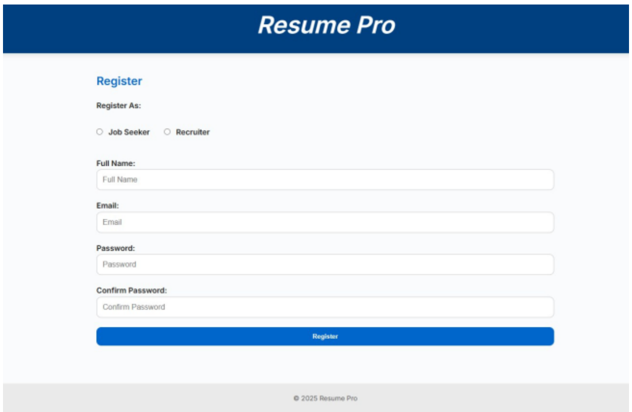
Upload resumes and match them against job requirements instantly using our AI.

Why Choose Resume Pro?

- ☑ Easy to use for students, job seekers, and recruiters
- ☑ AI-powered resume matching
- ☑ Modern, clean, and responsive interface
- ☑ Free to use – no registration fees

Fig. 2. Main Page

Fig. 2 shows the main page of Resume Pro, where users can choose between two primary functions which are resume crafting or resume screening.



Register

Register As:

○ Job Seeker ○ Recruiter

Full Name: Full Name

Email: Email

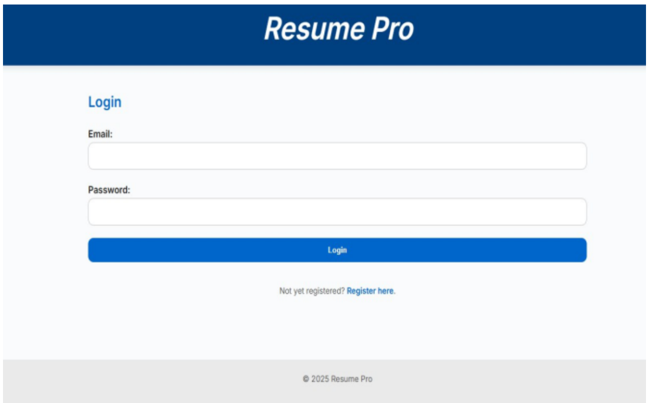
Password: Password

Confirm Password: Confirm Password

© 2025 Resume Pro

Fig. 3. Registration Page

Fig 3. shows the registration page for Resume Pro, where users create an account and select their role as either a job seeker or a recruiter.



Login

Email:

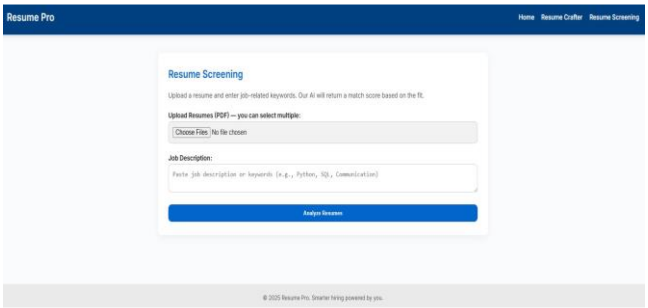
Password:

Not yet registered? Register here.

© 2025 Resume Pro

Fig. 4. Login page

Fig. 4 shows the login page for Resume Pro, where users enter their email and password to access the system.



Resume Screening

Upload a resume and enter job-related keywords. Our AI will return a match score based on the fit.

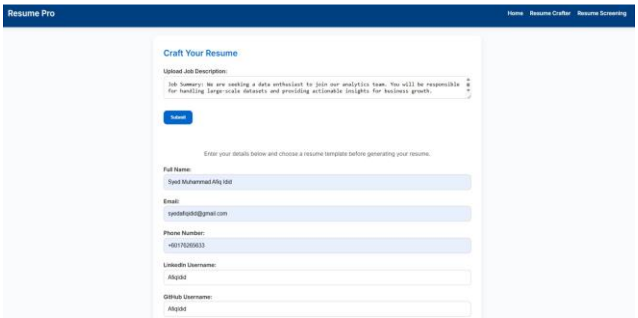
Upload Resumes (PDF) — you can select multiple: Choose Files No file chosen

Job Description: Paste job description or keywords (e.g., Python, SQL, Communication)

© 2025 Resume Pro. Smarter hiring powered by you.

Fig. 5. Resume Screening Page

Fig 5. presents the resume screening page, where recruiters can upload multiple resumes at once and input a job description to initiate the screening process.



Craft Your Resume

Upload Job Description:
Job Summary: We are seeking a data enthusiast to join our analytics team. You will be responsible for handling large-scale datasets and providing actionable insights for business growth.

Enter your details below and choose a resume template before generating your resume.

Full Name: Syed Muhammad Afiq Idid

Email: syedafiqidid@gmail.com

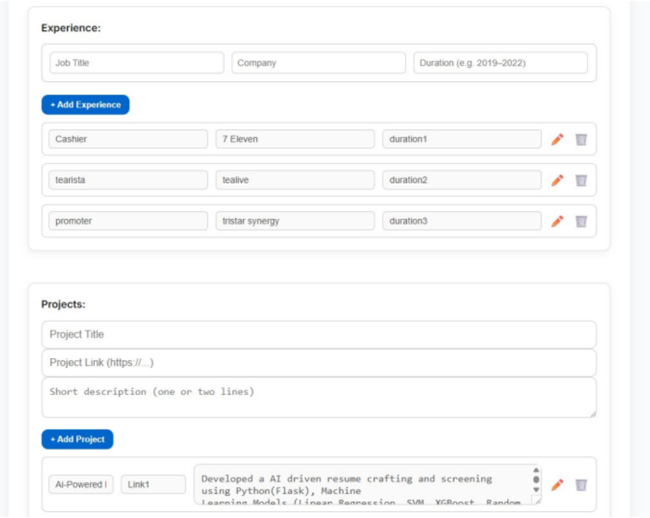
Phone Number: +60176265633

LinkedIn Username: Afiqidid

GitHub Username: Afiqidid

Fig. 6. Crafting Resume

Fig 6. Shows the crafting resume page for Resume Pro. This is where the user can upload job descriptions and submit them and input their personal details.



Experience:

Job Title | Company | Duration (e.g. 2019–2022)

Cashier	7 Eleven	duration1
tearista	tealive	duration2
promoter	tristar synergy	duration3

Projects:

Project Title

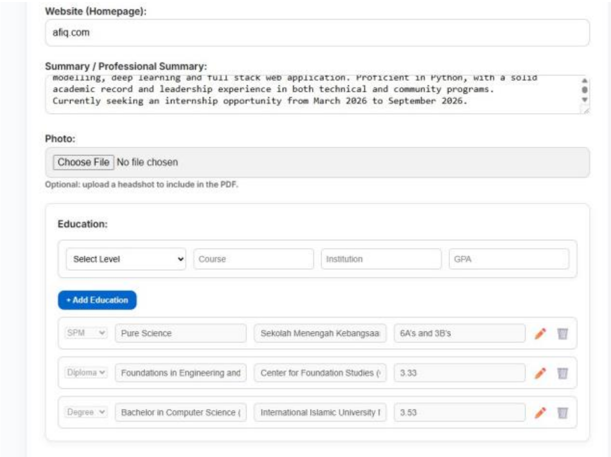
Project Link (https://...)

Short description (one or two lines)

Ai-Powered I | Link1 | Developed a AI driven resume crafting and screening using Python(Flask), Machine Learning Models (Linear Regression, SVM, XGBoost, Random

Fig. 7. Crafting Resume

Fig. 7 continues the resume crafting page, where users can enter details of their work experience and projects to further complete and refine their resume. Fig 8. Is also a continuation of the resume crafting page.



Website (Homepage): afiq.com

Summary / Professional Summary:
modelling, deep learning and full stack web application. Proficient in Python, with a solid academic record and leadership experience in both technical and community programs. Currently seeking an internship opportunity from March 2026 to September 2026.

Photo: No file chosen

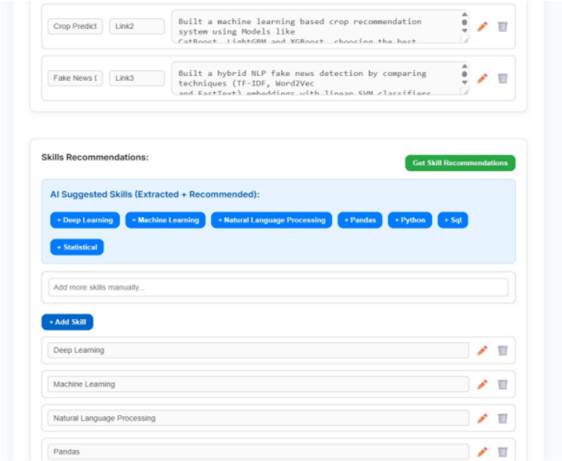
Optional: upload a headshot to include in the PDF.

Education:

Select Level | Course | Institution | GPA

SPM	Pure Science	Sekolah Menengah Kebangsaa	6A's and 3B's
Diploma	Foundations in Engineering and	Center for Foundation Studies (	3.33
Degree	Bachelor in Computer Science (	International Islamic University I	3.53

Fig. 8. Crafting Resume



Crop Predict | Link2 | Built a machine learning based crop recommendation system using Models like CatBoost, LightGBM and XGBoost, choosing the best

Fake News I | Link3 | Built a hybrid NLP fake news detection by comparing techniques (TF-IDF, Word2Vec and FastText) embeddings with linear SVM classifiers

Skills Recommendations:

AI Suggested Skills (Extracted + Recommended):

Add more skills manually...

Deep Learning

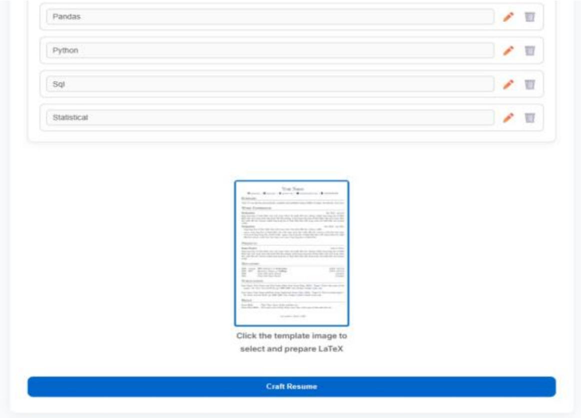
Machine Learning

Natural Language Processing

Pandas

Fig. 9. Crafting Resume

Fig 9. shows the section where users can add their skills and receive AI-generated skill recommendations.



Pandas

Python

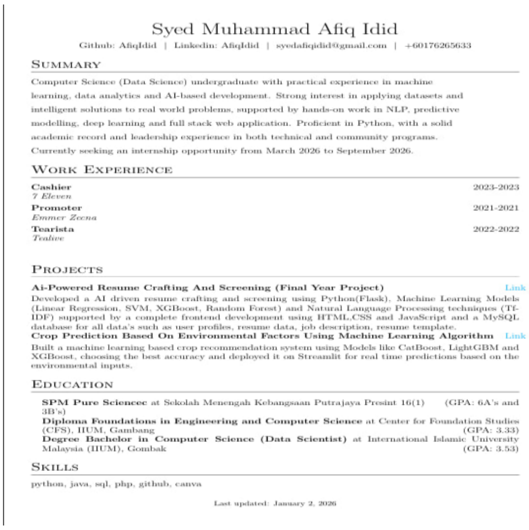
Sql

Statistical

Click the template image to select and prepare LaTeX

Fig. 10. Crafting Resume

Fig. 10 illustrates the Craft Resume function, where users can generate and download their resume in PDF format.



Syed Muhammad Afiq Idid

Github: AfiqIdid | Linkedin: AfiqIdid | syedafiqidid@gmail.com | +60176265633

SUMMARY

Computer Science (Data Science) undergraduate with practical experience in machine learning, data analytics and AI-based development. Strong interest in applying datasets and intelligent solutions to real world problems, supported by hands-on work in NLP, predictive modelling, deep learning and full stack web application. Proficient in Python, with a solid academic record and leadership experience in both technical and community programs. Currently seeking an internship opportunity from March 2026 to September 2026.

WORK EXPERIENCE

Cashier 2023-2023
7 Eleven

Promoter 2021-2021
Emmer Zeena

Tearista 2022-2022
Tealive

PROJECTS

Ai-Powered Resume Crafting And Screening (Final Year Project) Link
Developed a AI driven resume crafting and screening using Python(Flask), Machine Learning Models (Linear Regression, SVM, XGBoost, Random Forest) and Natural Language Processing techniques (Tf-IDF) supported by a complete frontend development using HTML,CSS and JavaScript and a MySQL database for all data's such as user profiles, resume data, job description, resume template.

Crop Prediction Based On Environmental Factors Using Machine Learning Algorithm Link
Built a machine learning based crop recommendation system using Models like CatBoost, LightGBM and XGBoost, choosing the best accuracy and deployed it on Streamlit for real time predictions based on the environmental inputs.

EDUCATION

SPM Pure Sciencec at Sekolah Menengah Kebangsaan Putrajaya Presint 16(1) (GPA: 6A's and 3B's)
Diploma Foundations in Engineering and Computer Science at Center for Foundation Studies (CFS), IIUM, Gambang (GPA: 3.33)
Degree Bachelor in Computer Science (Data Scientist) at International Islamic University Malaysia (IIUM), Gombak (GPA: 3.53)

SKILLS

python, java, sql, php, github, canva

Last updated: January 2, 2026

Fig. 11. Generated Resume

Fig 11. shows the resume that has been generated by Resume Pro in pdf format.

V. Conclusions

In conclusion, this project successfully developed Resume Pro, an AI-powered web application for resume crafting and candidate screening that addresses practical challenges in resume preparation and job–candidate matching. The system met its main objectives by delivering a unified platform that combines automation with artificial intelligence to support both job seekers and recruiters. Although several challenges were encountered during development, particularly in integrating and deploying the AI components, these issues were resolved and the final system operates as intended. Nevertheless, there remains scope for further enhancement to improve functionality, usability, and overall performance in future work. Future developments to improve Resume Pro web-based application include: Adding more resume templates to provide users with greater design and formatting options. Introducing a user profile dashboard that enables users to manage and update personal information more efficiently. Fine-tuning both AI models using larger and more diverse datasets across multiple sectors such as healthcare, legal, and arts to improve generalization. Strengthening security features, including password reset and password change functionality.

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Conflict of Interest

The authors declare that there is no conflict of interest.

AUTHORS CONTRIBUTION STATEMENT

All authors contributed equally to this work.

DATA AVAILABILITY STATEMENT

There is no external or third-party data that support the findings of this study.

ETHICS STATEMENT

This study did not require ethical approval

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