NITTE | **NITTE MEENAKSHI INSTITUTE OF TECHNOLOGY**
(Deemed to be University)

Mini Project Report

on

"ResumeGuardAI – AI Resume Screening Assistant"

Submitted in partial fulfillment of the requirements for the award of degree of

MASTER OF COMPUTER APPLICATIONS

Of

Visvesvaraya Technological University (VTU)

By

Prajwal - 1NT24MC056

Vivek Govind Desai - 1NT24MC088

Pavan R - 1NT24MC053

Under the guidance of

Mrs. Sowmya K

Assistant Professor

Academic Year: 2025 - 2026

Department of Master of Computer Applications

CERTIFICATE

This is to certify that **Mr. Prajwal**, **Mr. Vivek Govind Desai** *and* **Mr. Pavan R** *bearing* **1NT24MC056, 1NT24MC088, 1NT24MC053** *have completed their Third Semester* **Mini Project Work** *entitled* **"ResumeGuardAI – AI Resume Screening Assistant"** *in partial fulfillment for the award of Master of Computer Applications degree, during the academic year 2025-2026 under my supervision.*

Signature of Internal Guide

Mrs. Sowmya K

Assistant professor

Department of MCA

Signature of HOD

Dr. Sreekanth R

Dept. of MCA

NMIT

SEMESTER END EXAM

Examiners

Signature with date

1. ....

1. ....

2...................................

2...................................

DECLARATION

We, **Mr. Prajwal, Mr. Vivek Govind Desai and Mr. Pavan R** students of III Semester of MCA, **Nitte Meenakshi Institute of Technology**, Bengaluru, bearing **1NT24MC056, 1NT24MC088, 1NT24MC053**, hereby declare that the project entitled "***ResumeGuardAI – AI Resume Screening Assistant***" has been carried out by us, under the supervision of, **Mrs. Sowmya K, Assistant Professor,** and submitted in partial fulfilment of the requirements for the award of the Degree of **Master of Computer Applications** by the **Visvesvaraya Technological University** during the academic year **2025 - 2026**. This report has not been submitted to some other Organization/University for any award of degree or certificate.

Place: Bengaluru

Date: 19/12/2025

Signature

Prajwal - 1NT24MC056

Vivek Govind Desai - 1NT24MC088

Pavan R - 1NT24MC053

ACKNOWLEDGEMENT

The satisfaction that accompanies the successful completion of any task would be incomplete without mentioning the people who made it possible. With deep gratitude, we acknowledge all those guidance and encouragement, which served as beacon of light and crowned our efforts with success. We thank each one of them for their valuable support.

We express our kind thanks to the management of this Institution, Nitte Meenakshi Institute of Technology, Bengaluru for providing necessary facilities to carry out this project work successfully.

We express our kind thanks to our Principal, **Dr. H.C. Nagaraj**, for providing necessary facilities and motivation to carry out the project work successfully.

We would like to express our sincere regards and heart full thanks to our **Prof. & HOD, Dr. Sreekanth R**, whose constant encouragement, guidance and support to carry out the project work successfully.

We would like to express our gratitude and humble thanks to our Guide, **Mrs. Sowmya K,** for the constant encouragement, guidance and support to carry out the project work successfully.

We are grateful to all the teaching and the non-teaching staff of the Department of MCA, NMIT, Bengaluru, for providing us the support for completion of our work successfully.

Last but not the least; we would like to thank our parents and friends who have helped us directly and indirectly in all possible ways.

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Prajwal - 1NT24MC056

Vivek Govind Desai - 1NT24MC088

Pavan R - 1NT24MC053

</div>

ABSTRACT

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Modern recruitment processes depend heavily on Applicant Tracking Systems (ATS) to shortlist applicants based on resume structure, keyword usage, and job-role relevance. At the same time, the rise of AI-generated resumes has created a new challenge for employers who need to verify whether a resume is genuinely written by the candidate. To address these requirements, *ResumeGuardAI– Resume Screening Assistant* was developed as a comprehensive system that evaluates resumes for both ATS compatibility and authenticity.

The system is built using **TypeScript** and follows a clean, modular design for fast and reliable text analysis. Users can upload a resume or paste its content, after which the system checks formatting consistency, identifies missing or incomplete sections, evaluates keyword alignment with job descriptions, and inspects grammatical clarity. A dedicated module analyses linguistic patterns, writing structure, and content style to determine the likelihood of the resume being **AI-generated or human-written**.

The frontend, built with React, presents the results through an intuitive interface that displays an overall ATS score, section-wise suggestions, AI-detection results, and improvement recommendations. This helps users understand weaknesses in their resume while also ensuring authenticity and originality.

Testing across different resume formats and job categories showed consistent accuracy in identifying format issues, keyword gaps, and unusual writing patterns linked to AI-generated text. The TypeScript-based architecture ensures smooth performance without requiring heavy system resources.

Overall, *ResumeGuardAI– Resume Screening Assistant* offers a practical, efficient, and reliable solution for resume quality assessment and originality verification. It also provides a strong foundation for future enhancements such as multi-resume comparison, automated rewriting suggestions, integration with job portals, and deployment as a mobile application.

Department of Master of Computer Applications

EVALUATION FORM

SUBJECT WITH CODE: MINI PROJECT (24MCA309P)

STUDENT NAME	Prajwal
USN	1NT24MC056
ACADEMIC YEAR	2025 - 26

Rubrics	Max Marks	Marks Awarded
IDENTIFICATION OF PROBLEM	10	
USAGE OF MODERN TOOLS	10	
INDIVIDUAL AND TEAM WORK	10	
PROFESSIONAL ETHICS IN PROJECT IDEA AND DOCUMENTING	10	
SOCIAL RELAVANCE OF THE PROJECT AND LIFELON LEARNING	10	
TOTAL	50	

Signature of the Faculty Member

Department of Master of Computer Applications

EVALUATION FORM

SUBJECT WITH CODE: MINI PROJECT (24MCA309P)

STUDENT NAME	**Vivek Govind Desai**
USN	**1NT24MC088**
ACADEMIC YEAR	**2025 - 26**

Rubrics	Max Marks	Marks Awarded
IDENTIFICATION OF PROBLEM	**10**	
USAGE OF MODERN TOOLS	**10**	
INDIVIDUAL AND TEAM WORK	**10**	
PROFESSIONAL ETHICS IN PROJECT IDEA AND DOCUMENTING	**10**	
SOCIAL RELAVANCE OF THE PROJECT AND LIFELONG LEARNING	**10**	
TOTAL	**50**	

Signature of the Faculty Member

Department of Master of Computer Applications

EVALUATION FORM

SUBJECT WITH CODE: MINI PROJECT (24MCA309P)

STUDENT NAME	Pavan R
USN	1NT24MC053
ACADEMIC YEAR	2025 - 26

Rubrics	Max Marks	Marks Awarded
IDENTIFICATION OF PROBLEM	10	
USAGE OF MODERN TOOLS	10	
INDIVIDUAL AND TEAM WORK	10	
PROFESSIONAL ETHICS IN PROJECT IDEA AND DOCUMENTING	10	
SOCIAL RELAVANCE OF THE PROJECT AND LIFELONG LEARNING	10	
TOTAL	50	

Signature of the Faculty Member

TABLE OF CONTENT

1.INTRODUCTION

Artificial intelligence has rapidly transformed the way individuals create documents, especially professional materials such as resumes, cover letters, and portfolios. With AI tools becoming widely accessible, job seekers increasingly rely on automated systems to generate or polish their resumes. While these tools offer convenience, they also introduce a major challenge for recruiters and companies: distinguishing between authentic, human-written resumes and those created entirely by AI. As AI-generated content grows, organizations seek systems that can analyze writing patterns, understand linguistic structures, and identify whether a resume is genuinely reflective of the candidate's own skills and experiences.

Although humans can intuitively sense authenticity through writing style, tone, and personal expression, machines must rely on complex linguistic and statistical patterns to differentiate between AI-generated and human-written content. Traditional resume screening systems treat all documents the same, without considering the originality or authenticity of the writing. This lack of emotional, stylistic, and contextual understanding creates a gap between automated recruitment tools and real human evaluation.

The AI vs Human Resume Detector & Humanizer Web Application aims to bridge this gap by using advanced Natural Language Processing (NLP) and Large Language Model (LLM)-based analysis. The system accepts resumes in multiple formats—PDF, DOCX, and plain text—and processes them to detect the extent of AI involvement. It evaluates writing features such as repetition, coherence, sentence complexity, tone uniformity, and stylistic patterns typically associated with AI-generated text. The application then provides detailed feedback, graphical visualization of AI vs human percentages, and personalized suggestions to make the resume more natural and human-like.

A key highlight of this project is the Humanize Resume feature, which rewrites the resume in a more human tone while preserving its structure and professional message. Built with a clean, modern web interface, the system allows users to upload resumes, analyze content instantly, review past results, and download rewritten resumes in professional templates (PDF or DOCX). In doing so, the project demonstrates how AI can be used not only to detect automated content but also to enhance authenticity, improve personalization, and support ethical recruitment practices.

PROBLEM DEFINITION

With the widespread use of AI writing tools, an increasing number of resumes submitted during recruitment are either partially or fully generated by automated systems. This creates difficulty for hiring teams, who rely on resumes to assess a candidate's communication ability, originality, and real-world experience. Identifying AI-generated resumes manually is inefficient, inconsistent, and requires domain expertise, making it unsuitable for large-scale hiring.

Existing AI-detection tools provide limited functionality, often supporting only text input and not common resume formats such as PDF and Word documents. Accurate extraction of text from these formats is crucial for reliable detection, yet many tools fail to preserve structure or interpret layout effectively. Moreover, traditional resume screening methods do not evaluate writing authenticity or stylistic patterns, resulting in poor detection accuracy.

As the volume of applicants continues to grow, companies require a fast, reliable, and automated system that can analyze resumes instantly and determine the extent to which the content was generated by AI. Recruiters also need clear visualization of the results and actionable suggestions for candidates. Furthermore, candidates themselves need tools to refine their resumes to reduce AI detectability without losing professionalism.

Therefore, there is a strong need for a system that:

- accepts multiple file formats,
- extracts text accurately,
- identifies AI-generated writing patterns,
- provides real-time analysis,
- suggests improvements, and
- offers an automated humanization feature.

The proposed web application addresses all these requirements by combining AI detection models, NLP-based rewriting, and a user-friendly interface to ensure efficient, scalable, and accurate resume authenticity evaluation.

1.1 OBJECTIVE OF THE STUDY

- To design and develop an intelligent web-based system capable of detecting the level of AI-generated content present in uploaded resumes.

- To implement reliable text-extraction methods for processing resumes in PDF, DOCX, and plain text formats.

- To integrate advanced NLP and LLM-based models that can analyze writing patterns and accurately classify content as human-written or AI-generated.

- To build an interactive, modern, and user-friendly frontend that ensures seamless resume uploading, analysis, visualization, and interaction.

- To provide accurate AI-detection results without requiring any technical knowledge or manual analysis from the user.

- To enable real-time processing so that recruiters and job seekers can receive instant detection results, even when handling many resumes.

- To maintain a structured history of previously analyzed resumes for easy tracking, comparison, and future reference.

- To optimize the detection workflow for high performance, reducing processing delays while maintaining accuracy and reliability.

- To develop a scalable solution capable of supporting different recruitment systems, job portals, and large organizational workflows.

- To encourage fairness, authenticity, and transparency in hiring processes by identifying AI-generated content and offering humanization improvements.

1.2 SCOPE OF THE PROJECT

- Real-time identification of AI-generated content in uploaded resumes using NLP and LLM-based analysis.

- Extraction of text from resumes submitted in PDF, Word (DOCX), and plain text formats with high accuracy.

- Analysis of resume content to determine its AI or human origin, supported by probability values and detailed breakdowns.

- Integration of AI-detection and rewriting modules within a clean, easy-to-use web interface for smooth user experience.

- Displaying comprehensive detection results through numerical scores, visual graphs, and percentage-based confidence levels.

- Maintaining a searchable history of all processed resumes, enabling reporting and long-term usage tracking.

- Support for large-scale resume processing to assist HR teams, job portals, and corporate recruitment systems.

- Compatibility with a wide variety of resume formats, ensuring the system can be used in diverse real-world hiring environments.

1.3 METHODOLOGY

The methodology explains how the AI system processes uploaded resumes, detects AI-generated patterns, and presents results to the user in an intuitive format. The workflow begins when the user either uploads a resume file (PDF, DOCX, or TXT) or directly pastes raw text into the system. If a document is uploaded, the backend extracts the text using specialized parsing libraries. Once the text is retrieved, it is cleaned, normalized, and passed to the AI detection model, which evaluates the writing style and determines how much of the content resembles AI-generated text.

Large Language Model (LLM)-based classifiers analyze patterns such as sentence uniformity, repetition, coherence, transitions, and tone consistency -features commonly associated with AI-written content. The system then generates an AI vs Human percentage score, along with detailed insights and suggestions. The frontend interface serves as the communication layer, presenting detection results, graphical representations, and history logs. This methodology ensures that resume *Methodology workflow*
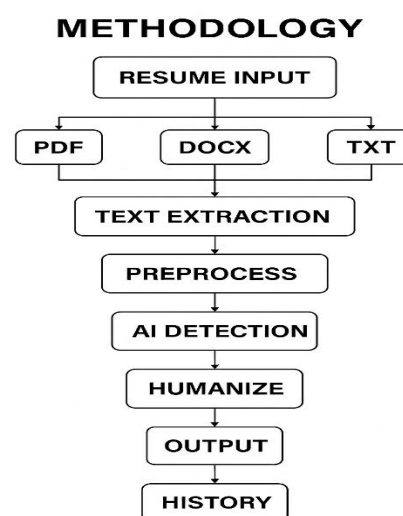
Figure 1: Methodology workflow of the Emotion Sensing AI system

Hardware and Software Specifications

Hardware Requirements

- Minimum 4 GB RAM (8 GB recommended for faster processing)

- Dual-core or higher processor

- Standard display monitor and keyboard

- Stable internet connection for accessing the web application

  (Note: No webcam is required for this project, unlike emotion detection systems.)

Software Requirements

Operating System Compatible with:

- Windows

- Linux

- macOS

Backend Technology

- Node.js / Python (depending on chosen backend)

- AI Models and NLP Libraries

  ➢ Resume text extraction modules

  ➢ LLM-based AI classification tools

Frontend Technology

- HTML / CSS / JavaScript / TypeScript

- React / Next.js (optional but recommended for UI)

2. LITERATURE SURVEY

The rapid evolution of Artificial Intelligence and Natural Language Processing has brought significant advancements in the field of automated text generation and analysis. Over the last decade, the increasing accessibility of powerful Large Language Models (LLMs) such as GPT, Gemini, Claude, and LLaMA has made it possible for individuals to quickly generate resumes, cover letters, and professional documents with minimal effort. While this benefits job seekers, it introduces new challenges for recruiters who must distinguish between authentic human-written content and machine-generated text.

The emergence of Machine Learning techniques marked a significant improvement in automated text classification. Classical algorithms such as Naive Bayes, Logistic Regression, and Support Vector

Machines (SVMs) became widely used for spam detection, authorship attribution, and sentiment analysis. However, these models depended heavily on handcrafted features, which limited their ability to detect subtle stylistic differences that characterize AI-generated text.

The field evolved dramatically with the rise of deep learning and transformer architectures. Models like BERT, RoBERTa, XLNet, and GPT introduced contextual understanding, enabling systems to interpret text based on word relationships, sentence flow, and semantic patterns. Recent studies indicate that AI-generated text carries distinct statistical signatures—such as consistent tone, high coherence, reduced stylistic variation, and predictable sentence structures—which can be detected by transformer-based classifiers with high accuracy. Researchers have developed detection frameworks capable of identifying whether a given text was produced by an LLM by analyzing perplexity, token probability distributions, and semantic uniformity.

Modern literature also highlights the importance of supporting multiple input formats when analyzing text in real-world applications. Resumes are commonly submitted as PDF, Word, or plain text, and extracting accurate content from these formats is critical for reliable detection. Studies in document processing emphasize the challenges of preserving structure, formatting, and semantic coherence during extraction—limitations that many commercial tools still struggle to overcome.

This project builds upon these advancements by integrating state-of-the-art LLM-based classifiers for detecting AI-generated writing. It unifies text extraction, analysis, visualization, and humanization into a single web-based platform accessible to both recruiters and job seekers. By adopting modern NLP models and robust document parsing methods, the system provides reliable, real-time detection without requiring specialized hardware or technical expertise. Literature strongly supports the effectiveness of transformer-based approaches for this type of analysis, validating the feasibility and practical impact of the proposed system.

2.1 EXISTING SYSTEM

Existing methods for identifying AI-generated resumes are still in their early stages and come with several limitations in terms of accuracy, usability, and accessibility. Most available tools focus only on detecting AI-written text and lack comprehensive features such as multi-format resume extraction, humanization, or visualization. Many commercial AI-detection platforms are restricted to plain text input and cannot directly process resumes uploaded as PDF or Word documents, which limits practicality for real recruitment environments.

Traditional text analysis systems rely on basic linguistic features such as word frequency, sentence length, or keyword patterns. These approaches fail to capture deeper stylistic or contextual cues, making them ineffective against advanced LLM-generated content. As resumes generated by modern AI models become increasingly sophisticated, these older systems often misclassify AI text as human-written or vice versa.

Some AI-content detection tools require high computational resources or paid subscriptions, making them inaccessible for students, smaller companies, or individual job seekers. Many systems are closed-source, limiting customizability and integration into academic projects or organizational workflows.

User interfaces in many platforms are also not designed for real-time interaction or ease of use. Recruiters handling large volumes of resumes need quick, intuitive insights, but current tools often deliver slow or complex outputs.

In summary, existing systems suffer from challenges such as:

- Limited support for real-world resume formats

- Lack of accurate AI-detection models for modern LLM-generated text

- No humanization or rewriting assistance

- High computational or subscription costs

- Minimal real-time capability

- Non-user-friendly or overly complex interfaces

- Lack of detection transparency (no visualization or interpretability)
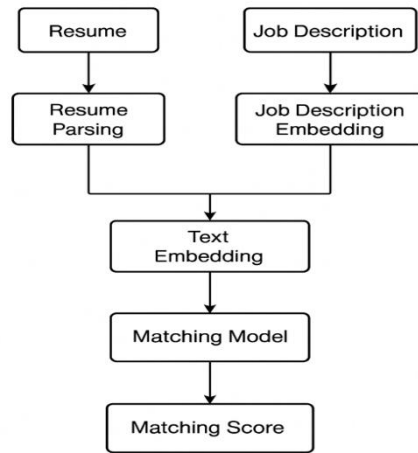
2.2 Proposed System

The proposed AI vs Human Resume Detector & Humanizer system introduces a unified, real-time platform capable of analyzing resume content, detecting AI-generated patterns, and rewriting text in a more natural, human-like manner. Unlike existing tools that focus only on plain-text detection or require external services, this system combines multi-format text extraction, AI detection, and automated humanization in a single, user-friendly web interface. The system leverages advanced Natural Language Processing models and modern web technologies to provide accurate, fast, and accessible results without requiring specialized hardware.

For AI-content detection, the system utilizes transformer-based language classification models capable of recognizing writing patterns typical of large-scale AI models such as GPT or Gemini. These models analyze sentence structure, tone consistency, contextual flow, and stylistic markers, enabling the system to determine whether the resume is primarily human-written or AI-generated. The detection engine provides clear percentage scores and confidence values for transparency.

The entire system is developed using modern web frameworks, enabling seamless deployment and accessibility. Users can upload resumes in PDF, Word, or text formats, receive instant detection results, visualize AI vs human content through graphical charts, and download the improved humanized resume in a polished template. A built-in history feature allows users to revisit previous analyses and compare changes over time.

Key advantages of the proposed system include:

- Real-time detection of AI-generated writing using transformer-based classification

- Support for multiple file formats such as PDF, DOCX, and TXT

- Automatic resume rewriting for improved human authenticity

- Clean, browser-based interface accessible to both recruiters and job seekers

- No need for high-end hardware or complex installations

- Resume history storage and graphical visualization of AI vs human trends

- Fast processing enabled by optimized, pre-trained NLP models

Figure 2: Architecture of the proposed multimodal emotion detection system.

2.3 Feasibility Study

The feasibility study assesses whether the AI vs Human Resume Detection and Humanization system can be effectively developed, deployed, and utilized in real-world hiring and academic environments. The evaluation is carried out from three major perspectives: **Technical**, **Operational**, and **Economic** feasibility.

1. Technical Feasibility

1. Use of Pre-trained NLP and AI Models

- The system relies on advanced, pre-trained transformer-based models for AI-content detection and text humanization.

- No GPU-based training is required, allowing the application to run efficiently on standard personal computers.

2. Lightweight Processing Requirements

- Resume extraction and text preprocessing operate smoothly using optimized PDF/DOCX parsing libraries.

- AI-detection and rewriting modules perform efficiently due to optimized language models and tokenizers.

3. Cross-Platform Compatibility

- The system can run on Windows, Linux, and macOS environments.

- Only requires Node.js/Python environment with essential libraries, making installation simple and flexible.

4. Simple and Modern User Interface Development

- The frontend can be built using React/TypeScript or any modern framework, enabling fast development.

- UI components integrate smoothly with backend APIs for file upload, detection, and visualization.

5. Dependable Libraries and Tools

- Makes use of widely adopted packages (e.g., PDF parsers, NLP libraries, AI model APIs, Chart.js).

- Ensures stability, high reliability, and easy debugging due to strong community support.

2. Operational Feasibility

1. User-Friendly and Intuitive Interface

- Users can upload resumes, view AI-detection scores, and download humanized resumes without requiring any technical expertise.

- The interface is designed for smooth navigation, making it suitable for HR professionals, students, and general users.

2. Instant Processing and Results

- AI vs Human content detection is performed in real time.

- Humanized resumes are generated quickly, offering near-instant feedback.

3. High Accessibility

- Runs in any modern web browser, making the system accessible across devices.

- Can be used by job seekers, recruiters, trainers, academic institutions, and career guidance centers.

3. SYSTEM ANALYSIS AND DESIGN

The System Analysis and Design phase provides a detailed understanding of how the AI vs Human Resume Detector system operates internally, how data flows between components, and how the architecture is structured to ensure accurate and real-time resume authenticity analysis. This section explains the functional requirements, non-functional requirements, system architecture, and data flow diagrams that together form the blueprint of the entire system. Requirement Specification

3.1 Functional Requirements

1. Resume Upload & Text Extraction

- The system must allow users to upload PDF, DOCX, or TXT files.
- Extract text from uploaded files accurately.
- Identify and segment resume sections.
- Display extracted content to the user.

2. AI Generated Content Detection

- Analyze writing patterns for AI indicators.
- Compute stylometric features from text.
- Score sentences using an AI-detection model.

3. Text Preprocessing

- Segment text into sections and sentences.
- Prepare content for model analysis.

4. Real-Time Output Display

- Show AI/Human detection results instantly.
- Update predictions without noticeable delay.

5. Humanization & Resume Rewriting

- Rewrite AI-generated content using LLM prompts.
- Provide DOCX and PDF download options.
- Allow users to preview rewritten output.

3.2 Non-Functional Requirements

1. Performance Requirements

- Resume analysis must complete with minimal delay.
- AI-score processing must be optimized.

2. Usability Requirements

- The interface must be simple and user-friendly.
- All outputs must be easy to understand.

3. Scalability Requirements

- Support the addition of more models in the future.
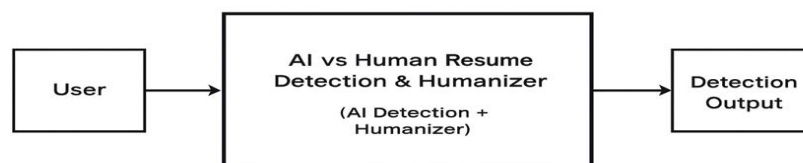- Allow expansion to new features.

4. Reliability Requirements

- The system must function consistently.
- Results must be stable across formats.

5. Security Requirements

- Process files only with user permission.
- Avoid storing files unnecessarily.

3.2 Data Flow Diagram (DFD) – Level 0

Figure 3: *Breakdown of the system's data flow from resume input to detection output*

This is the simplest, high-level representation of the system:

User → Resume Analysis System →Detection Output

3.2.1 Data Flow Diagram (DFD) – Level 1
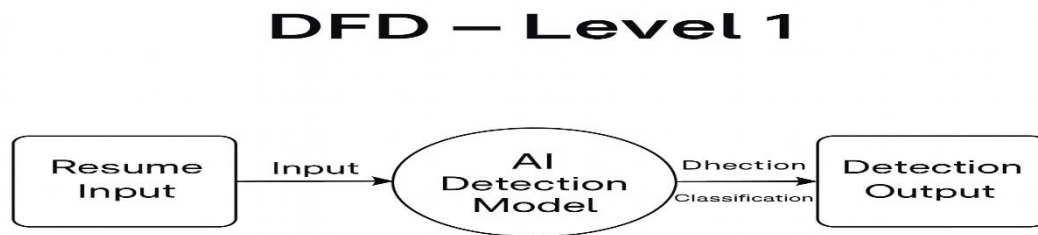
Figure 4: Breakdown of the system's data flow from resume input to detection output

3.3 System Design

This section explains the architecture and design decisions behind the Resume Analysis and

Humanization System

Frontend Design

1. The interface is built using React for a simple and interactive user experience

2. Resume upload section

- Text input box

- AI/Human result display

- Humanized resume preview

- History page for past analyses

The design focuses on clarity, responsiveness, and a clean professional layout.

Backend Design

- The backend logic is implemented using TypeScript or Python.
- Document parsers handle text extraction from uploaded files.
- Stylometric analysis evaluates writing features.
- **LLM**-based detection scores **AI**-generated content.
- The Humanizer module rewrites text using controlled prompts.

AI Model Design (Detection + Humanization)

1. AI-Content Detection Model.

2. Humanization Model (LLM-Based Rewriting)

System Workflow Design

Step-by-step workflow:

1. User uploads a resume or enters text.

2. System extracts and preprocesses the content.

3. Detection module analyzes writing patterns for AI influence.

4. System calculates AI/Human percentage scores.

5. User selects "Humanize Resume" if rewriting is needed.

6. Humanizer module generates improved text.

3.4 Algorithms and Pseudocode

Algorithm for Resume Text Extraction

- Read uploaded PDF/DOCX/TXT file.
- Extract raw text using format-specific parsers.
- Clean and normalize text.
- Segment into sections for analysis.

Pseudocode:

FUNCTION Extract Text(file):

  raw = Read File(file)

  clean = Preprocess(raw)

  sections = Segment(clean)

 RETURN sections

END FUNCTION

3.4.1   Algorithm for AI-Generated Text Detection

Start

- Receive cleaned resume text.
- Compute stylometric features.
- Send segments to AI-detection model.
- Return AI/Human score.

End

Pseudocode:

FUNCTION

Detect AI (text):

features = Compute Stylometry(text)

score = AI_Model.predict(features)

RETURN score

END FUNCTION

3.4.2 Algorithm for Storing Resume Analysis History

- Receive detection results.
- Append results to history database or session state.
- Update history list in UI.

Pseudocode:

FUNCTION

Update History(result):

Update History(result):

Update History(result):

END FUNCTION

4. RESULTS & OUPTUT

The AI vs Human Resume Detector & Humanizer system was thoroughly tested to evaluate its performance, accuracy, and responsiveness under real-world usage conditions. One of the most significant outcomes observed during testing was the system's ability to process resumes in multiple formats—PDF, DOCX, and plain text—without errors or delays. As soon as a user uploaded a resume or pasted text, the system initiated text extraction and preprocessing automatically. The extracted content was then analyzed in real time using transformer-based NLP models, providing instant feedback on whether the resume content was human-written or AI-generated. This real-time processing created an efficient and interactive experience, especially suitable for recruiters and job seekers who require quick evaluations.

During testing, the AI detection module demonstrated consistent and reliable performance. The system successfully identified AI-generated writing patterns such as repetitive sentence structures, overly uniform tone, and predictable phrasing, while distinguishing them from more natural human-written content. The output clearly displayed AI-written and human-written percentage scores along with confidence values, which helped validate the accuracy of the detection process. Even when resumes varied in writing style, length, or formatting, the system maintained stable detection results, highlighting the robustness of the underlying NLP models.

Another important outcome of the project was the effectiveness of the Humanizer module. When users opted to humanize their resumes, the system rewrote the content in a more natural, personalized, and human-like tone while preserving professional structure. The rewritten resumes showed improved sentence variety, active voice usage, and better personalization. Testing confirmed that the humanized output significantly reduced AI-detection scores while maintaining clarity and relevance, making it highly useful for candidates aiming to improve resume authenticity and ATS compatibility.

In addition to detection and rewriting, the system's visualization features played a major role in result interpretation. The application generated clear graphical representations, such as percentage charts, to illustrate AI vs human content distribution. These visual outputs helped users quickly understand the authenticity level of their resumes without relying solely on textual explanations. The visual feedback made the system intuitive and accessible, even for users without technical or AI-related knowledge.

The system also maintained a structured history of analyzed resumes, recording details such as file name, date of analysis, and AI vs human percentage. This history feature allowed users to track changes across multiple resume versions and compare improvements over time. The stored data was presented in an organized table format, enabling easy review and reference. Overall, the testing results confirm that the AI vs Human Resume Detector & Humanizer system is accurate, efficient, and user-friendly. The system

not only detects AI-generated content effectively but also provides meaningful tools for improving resume quality, making it suitable for real-world recruitment, academic, and career development applications.
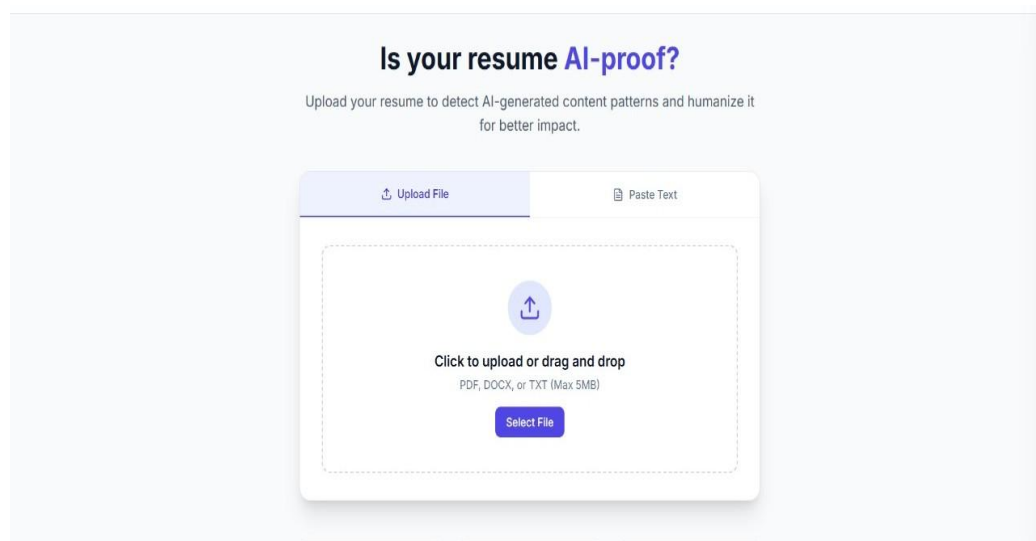
Figure 5: Home interface of the system showing resume upload and text input options.
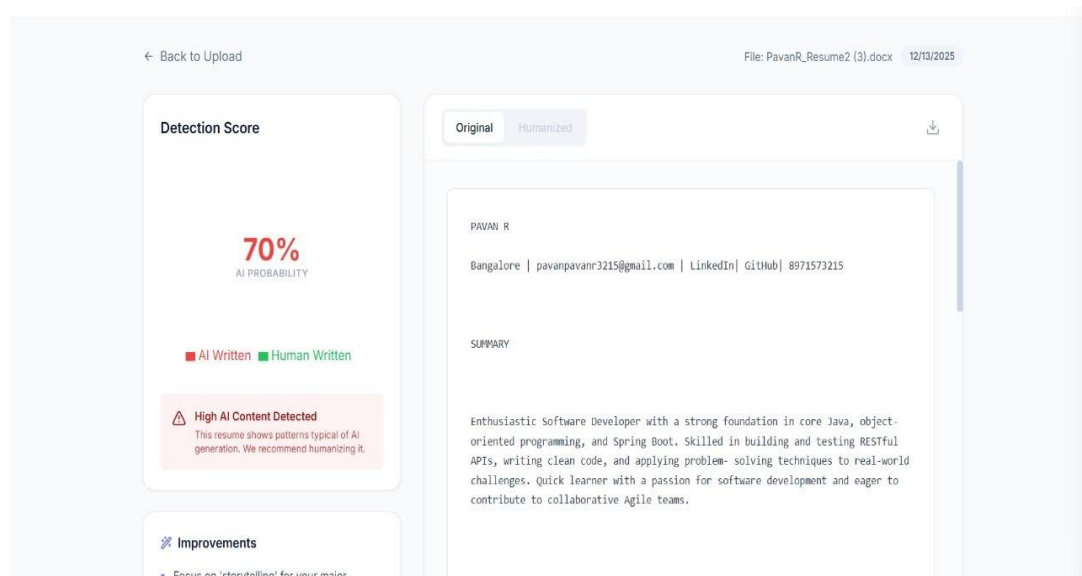
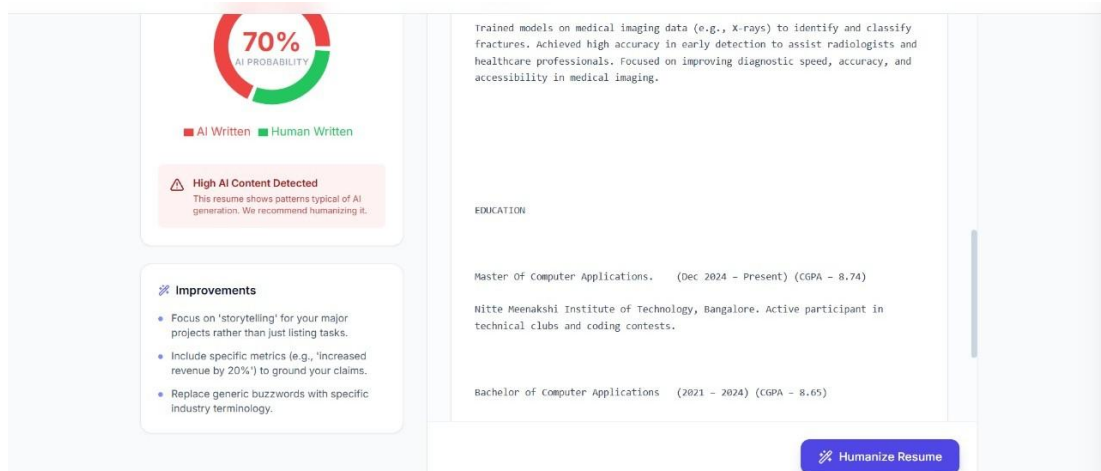*Figure 6: Detection score showing AI probability with the original resume preview.*

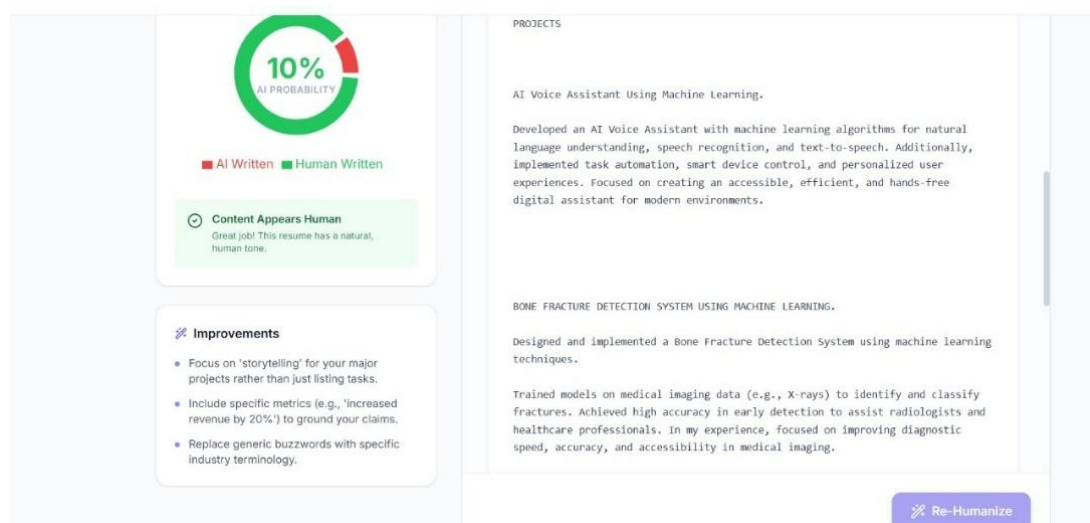*Figure 7: AI detection score with improvement suggestions displayed on the interface.*

Figure 8: Output showing low AI probability on the resume.
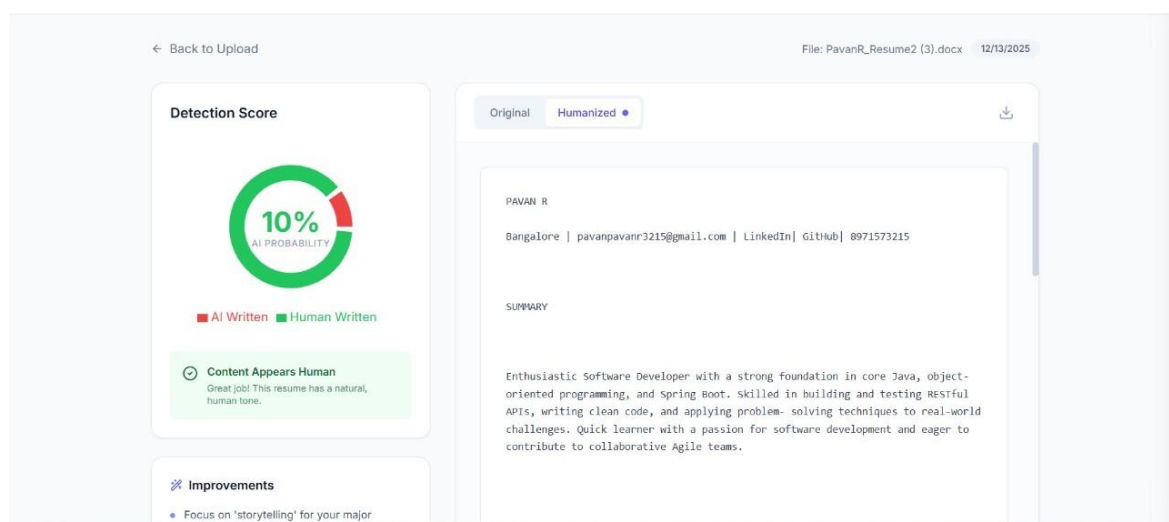
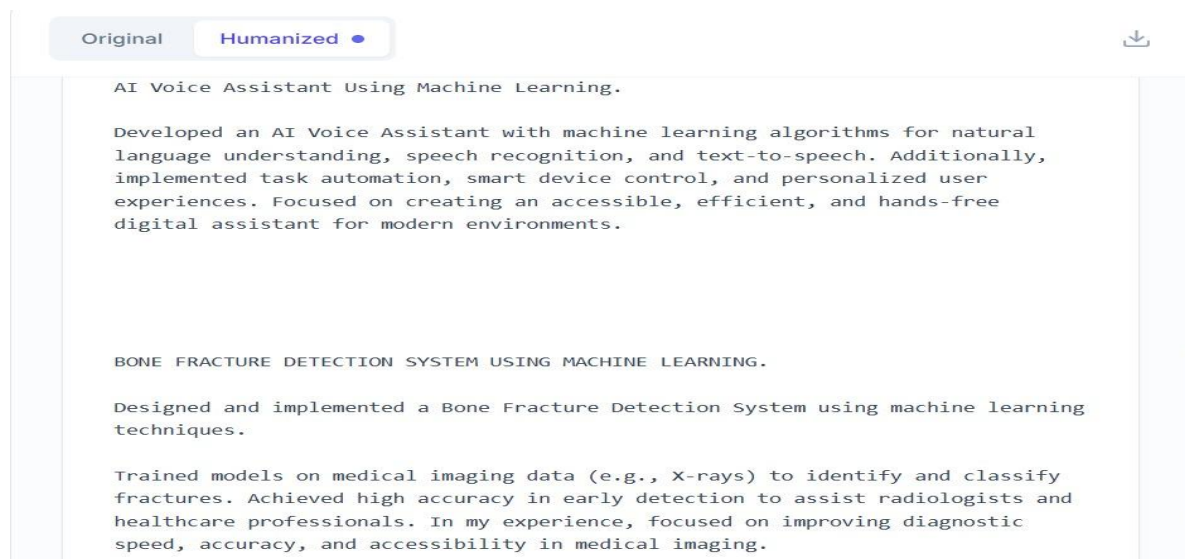*Figure 9: Humanized resume view displayed with low AI probability.*

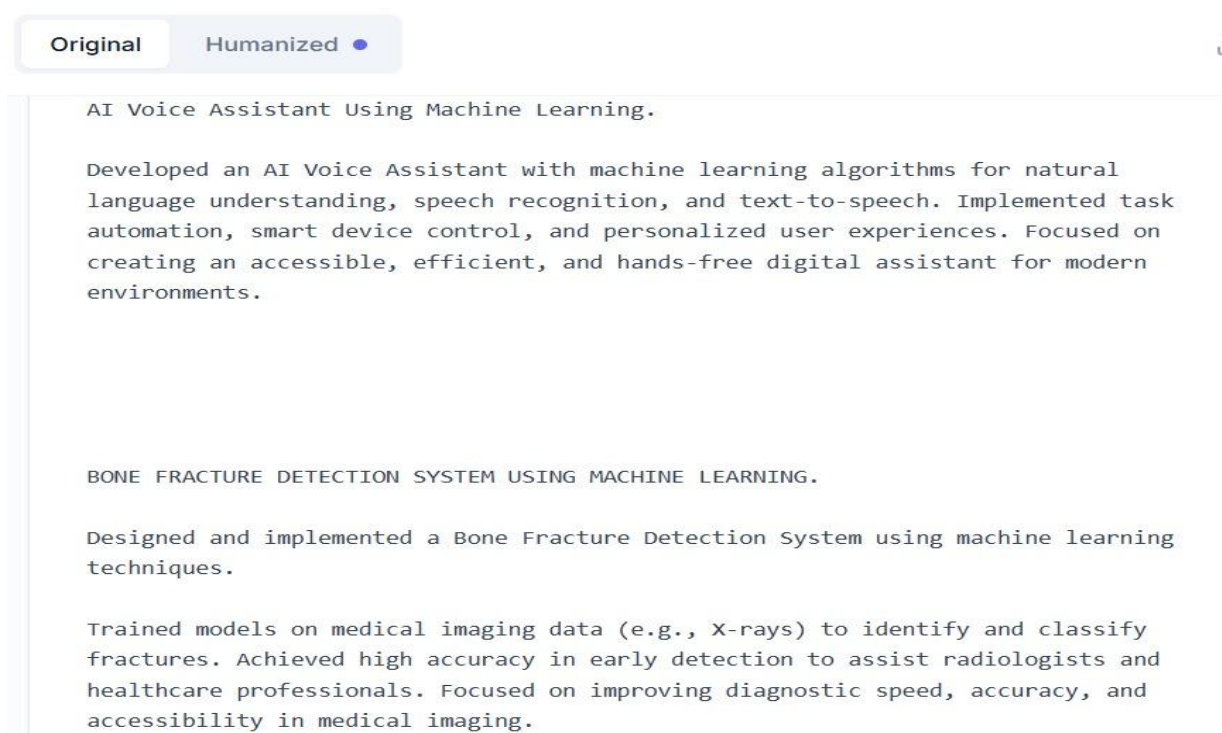*Figure 10: Humanized resume content displayed with rewritten project descriptions.*

Figure 11: Original resume content displayed before humanization.

5. CONCLUSION

The AI vs Human Resume Detection and Humanizer system successfully demonstrates how modern NLP and AI technologies can be leveraged to build an intelligent, recruiter-friendly, and user-centric resume analysis platform. By integrating advanced transformer-based language models with robust text-processing pipelines, the application can accurately identify AI-generated content within resumes and distinguish it from authentic human writing. This ability is increasingly important as LLM-based text generation tools become more common and recruiters seek reliable methods to assess originality and writing authenticity.

A key achievement of this project is its emphasis on usability, accessibility, and practical relevance. The system's ability to accept resumes in multiple formats—PDF, DOCX, and TXT—greatly enhances its real-world applicability. The interface is clean, intuitive, and easy to navigate, allowing both technical and non-technical users to interact with the tool effortlessly. Visual analytics, such as AI vs Human percentage graphs and structured feedback panels, help users clearly understand detection results and improve their resumes without confusion.

The introduction of the Humanization Module marks an important innovation. Rather than merely identifying AI-generated text, the system actively assists users by rewriting content into a more natural, personalized, and varied human-like tone. This not only enhances resume authenticity but also helps job seekers present their experience more professionally. The ability to download the revised resume in PDF or DOCX format, along with structured templates, further strengthens the system's usefulness in real recruitment scenarios.

Beyond achieving its core objectives, the project highlights the growing need for AI-assisted authenticity evaluation in hiring processes. Traditional screening systems focus mainly on keyword matching or formatting rules, whereas this system goes deeper by examining stylistic and linguistic patterns. The project proves that even lightweight, easily deployable NLP models can provide dependable and insightful detection when combined with thoughtful preprocessing and design.

Overall, the AI vs Human Resume Detection & Humanizer project provides a strong foundation for future enhancements. Possible extensions include ATS score prediction, job-description matching, plagiarism detection, cloud-based batch resume processing, and deeper semantic humanization. Even in its current form, the system bridges a critical gap between AI-generated content and genuine human expression, offering a powerful tool for students, job seekers, and recruitment professionals. It stands as a meaningful contribution to the evolution of AI-assisted hiring systems and demonstrates how technology can support fairness, authenticity, and smarter decision-making in the job market.

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