iJRASET
International Journal For Research in Applied Science and Engineering Technology

INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 14 **Issue:** II **Month of publication:** February 2026

DOI: https://doi.org/10.22214/ijraset.2026.77608

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International Journal for Research in Applied Science & Engineering Technology (IJRASET)
ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.538
Volume 14 Issue II Feb 2026- Available at www.ijraset.com

Resume Intelligence System: An AI-Driven Framework for Automated Resume Evaluation

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Abstract: ***The exponential growth of online recruitment platforms has significantly increased the volume of resumes received for each job posting, making manual screening inefficient and error-prone Conventional Applicant Tracking Systems (ATS) rely heavily on keyword matching techniques that fail to capture semantic relevance, academic consistency, and real-world skill validation.***

This research presents an AI-driven Resume Intelligence System that automates resume evaluation using Natural Language Processing (NLP), Generative Artificial Intelligence, and mathematically defined ATS scoring framework The proposed system integrates hybrid AI logic with deterministic fallback mechanisms to ensure reliability and transparency Experimental observations demonstrate improved screening accuracy, reduced recruiter workload, and enhanced fairness compared to traditional ATS solutions.

Keywords: Resume Intelligence System, Applicant Tracking System, Automated Recruitment, Natural Language Processing, ATS Score, Artificial Intelligence

I. INTRODUCTION

Digital recruitment has transformed talent acquisition by enabling organizations to source candidates globally However, the resulting surge in resume submissions has created significant challenges in screening and evaluation Recruiters often face inconsistencies due to subjective judgment, fatigue, and lack of standardized assessment metrics Although ATS platforms aim to mitigate these issues, most systems perform shallow keyword filtering without contextual understanding This paper proposes an intelligent resume evaluation framework that produces explainable and standardized ATS scores.

II. LITERATURE REVIEW

Previous research in recruitment automation focused on Boolean search techniques and rule-based filtering Later studies introduced machine learning models for resume classification and ranking Recent advancements in NLP and deep learning have enabled semantic resume analysis; however, these systems often lack transparency and robustness Limited research exists on hybrid architectures that combine AI-based intelligence with deterministic scoring models, motivating the proposed framework

III. PROBLEM STATEMENT

Existing ATS platforms suffer from several limitations, including absence of academic normalization, inadequate evaluation of project and internship experience, lack of code validation, and vulnerability to system downtime. These limitations reduce screening accuracy and recruiter trust The objective of this research is to design a reliable and explainable resume evaluation system that addresses these challenges.

IV. SYSTEM ARCHITECTURE

The proposed Resume Intelligence System follows a modular architecture comprising a presentation layer, resume processing layer, AI evaluation layer, scoring engine, and persistence layer Streamlit is used for interface development, while resume parsing is performed using PDF extraction libraries NLP techniques preprocess resume text for structured analysis The scoring engine computes ATS scores using defined equations, and results are stored in a relational database.

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V. METHODOLOGY

1) Resume Ingestion: The methodology begins with resume ingestion in PDF format through the user interface.
2) Text Preprocessing: Extracted text undergoes preprocessing steps such as tokenization, stop-word removal, and normalization using NLP techniques.
3) Evaluation Process: Educational qualifications are extracted using pattern recognition and Al-based parsing.

Skill relevance is determined through contextual NLP analysis, while projects and internships are evaluated based on technical depth and domain roce. GitHub profiles are validated to assess practical coding exposure

VI. ATS SCORING FRAMEWORK

The system calculates a standardized ATS score out of 100 using weighted resume components the ATS score is computed using the following equation:

ATS_Score = E + S + P + I + O + G

where E denotes Education Score (0–30),
S represents Skills Score (0–30),
P indicates Project Score (0–10),
I corresponds to Internship Score (0–10),
O represents Objective Score (0–10), and G denotes GitHub Validation Score (0–10)
Academic normalization is performed using the formula:
Percentage = CGPA × 9 5

VII. HYBRID AI AND FALLBACK LOGIC

To ensure uninterrupted evaluation, the system employs hybrid AI logic Generative AI performs contextual resume analysis when services are available In case of service disruption, a deterministic fallback engine applies rule-based extraction and scoring This approach guarantees consistent ATS score computation.

VIII. RECRUITER DECISION SUPPORT MODULE

The recruiter dashboard provides functionalities such as ATS-based filtering, skill-wise candidate ranking, score distribution analytics, and resume comparison these features enable objective shortlisting and data-driven hiring decisions.

IX. EXPERIMENTAL EVALUATION

The system was tested using resumes from diverse educational and professional backgrounds Results indicate improved accuracy in academic extraction, reduced false skill matches, and consistent ATS scoring Recruiter screening time was reduced significantly compared to manual evaluation.

X. ADVANTAGES

The proposed framework offers explainable scoring, reduced human bias, improved reliability through hybrid logic, and scalability for enterprise-level recruitment.

XI. LIMITATIONS

Limitations include dependency on resume formatting, basic GitHub contribution analysis, and reliance on external AI services.

XII. FUTURE SCOPE

Future work includes deep semantic skill ranking, multilingual resume analysis, ATS-job description compatibility scoring, and enhanced open-source contribution evaluation

XIII. CONCLUSION

This research presented an AI-driven Resume Intelligence System that automates resume evaluation using NLP and AI technologies By incorporating a mathematically defined ATS scoring framework and hybrid reliability mechanisms, the system enhances fairness, transparency, and efficiency in recruitment processes.

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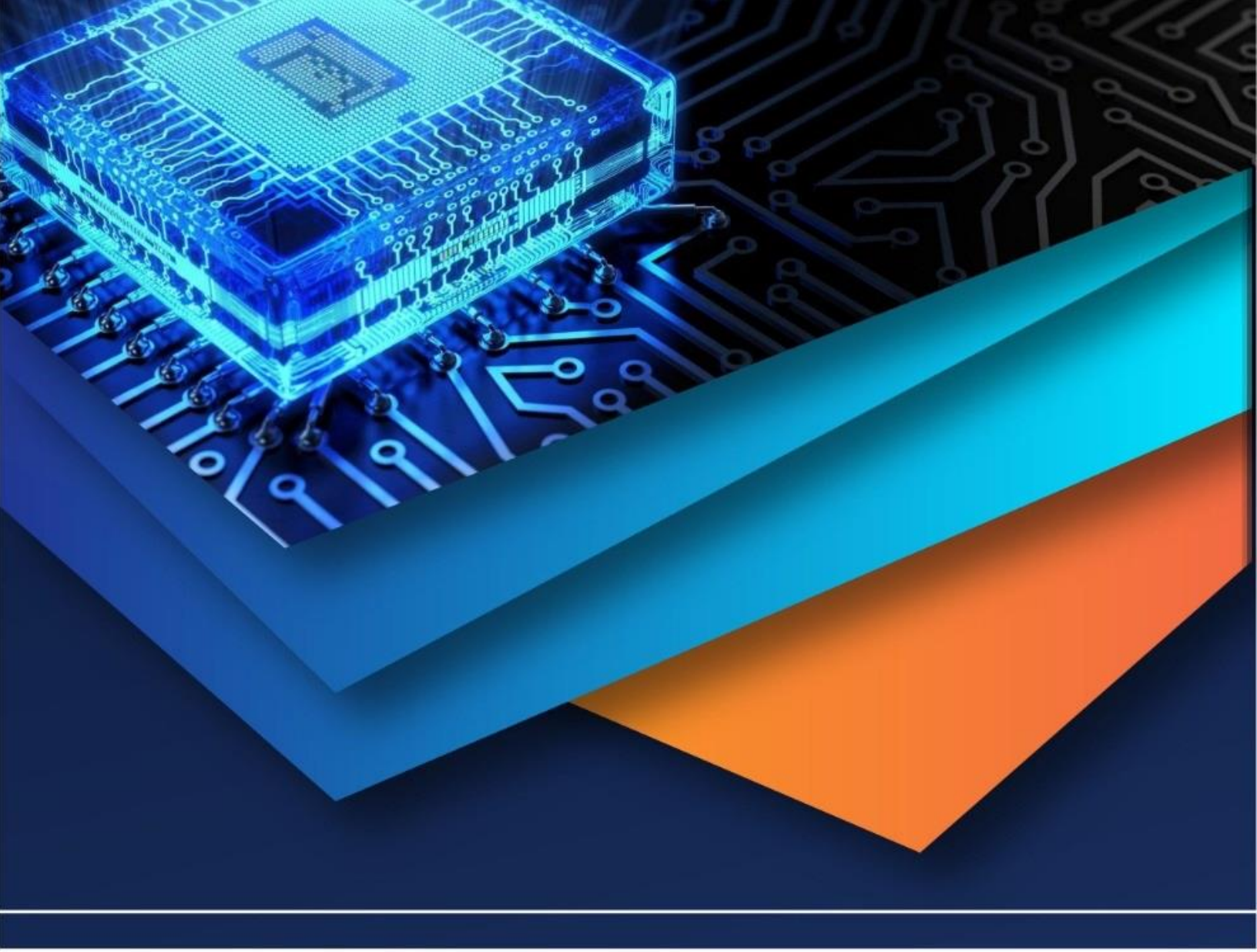

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