Project Proposal: Smart Resume Screener

1. Introduction

Recruiting qualified candidates from a large pool of applicants remains one of the biggest challenges for HR departments. This project proposes the development of an intelligent Resume Screening Application that uses Natural Language Processing (NLP) and Machine Learning (ML) to automate resume evaluation, categorize candidates, and provide feedback for improvement.

2. Objectives

- Develop a user-friendly web application for resume upload and analysis.
- Extract and analyze resume content from PDF, DOCX, and image files.
- Classify resumes into job categories.
- Score resumes based on relevance.
- Suggest improvements for better resume quality.
- Integrate BERT using MindSpore for advanced NLP capabilities.

3. Key Features

- Secure login and personalized user sessions.
- Multi-format resume upload and OCR integration.
- TF-IDF vectorization and rule-based keyword analysis.
- Job category prediction and resume scoring.
- BERT integration via MindSpore to explore semantic similarity.
- Resume summary generation and suggestion engine.

4. Technical Stack

Frontend: Streamlit

Backend: Python, Scikit-learn, PyMuPDF, python-docx, pytesseract, re

NLP/ML: TF-IDF for feature extraction, Rule-based classification, BERT with MindSpore for contextual NLP

Deployment: Streamlit Cloud, Heroku, Docker (optional)

5. MindSpore BERT Integration

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A separate module in the project integrates the BERT model using Huawei?s MindSpore framework. This was used to test deep contextual embeddings and semantic similarity in resume content, paving the way for future implementation of transformer-based classification instead of rule-based logic.

6. Future Enhancements

- Fully switch to BERT-based prediction

- Integrate job description matching

- Multilingual support

- Resume benchmarking and dashboards

- Interactive AI resume coach

7. Use Cases

- Recruiters: Automate job matching and reduce screening time.

- Job Seekers: Get personalized resume insights.

- Career Counselors: Help candidates align resumes with job markets.

8. Conclusion

The Smart Resume Screener will automate and enhance resume analysis using AI. By combining OCR, NLP, ML, and BERT integration through MindSpore, the system offers scalable, accurate, and insightful solutions for both recruiters and applicants.