

SkillSync: An AI-Based Skill Gap Analyzer Using Machine Learning

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Abstract:

This paper presents SkillSync, an AI-based skill gap analyzer designed to identify the difference between a student's existing skills and industry-required skills. The system uses machine learning techniques to extract skills from resumes and compare them with predefined industry skill sets. A recommendation system suggests relevant courses and resources to improve employability. The model is implemented using Python and achieves efficient skill matching with improved accuracy. The proposed system helps students understand their skill gaps and enhances career readiness.

Keywords:

Machine Learning, Skill Gap Analysis, Resume Parsing, Recommendation System, Python, Artificial Intelligence

Introduction:

This paper presents the design and implementation of SkillSync, an AI-based skill gap analyzer developed using Python and machine learning techniques. In today's rapidly evolving job market, there exists a significant gap between the skills possessed by students and the skills required by industries. This gap affects employability and limits career growth opportunities. Many students are unaware of the exact skills they need to acquire, and traditional methods of skill assessment are manual, time-consuming, and lack accuracy. Therefore, there is a need for an automated and intelligent system that can analyze user skills and provide proper guidance. The proposed system accepts user input in the form of resumes or manually entered skills and uses natural language processing techniques to extract relevant skill information. These extracted skills are then compared with predefined industry-required skills to identify missing competencies. Based on this analysis, the system provides personalized recommendations such as courses and learning resources to improve the user's skill set. The implementation of SkillSync aims to provide a simple, efficient, and user-friendly solution to bridge the gap between academic learning and industry requirements.

Body of the Paper:

The body of the paper explains the overall working and structure of the proposed system. The SkillSync system is designed to perform skill analysis and recommendation in a systematic manner. Initially, the user provides input either by uploading a resume or by manually entering their skills. The input data is then processed using natural language processing techniques to extract meaningful keywords related to skills. These extracted skills are stored and compared with a predefined dataset containing industry-required skills. The comparison process identifies the missing skills, which represent the gap between the user's current knowledge and industry expectations.

After identifying the skill gap, the system generates appropriate recommendations to help the user improve their skills. These recommendations may include online courses, tutorials, or other learning resources relevant to the missing skills. The system is implemented using Python, which provides flexibility and

efficiency in handling data processing and machine learning operations. The overall process is designed to be simple, fast, and accurate, making it suitable for students and job seekers.

The proposed system offers several advantages over traditional methods. It reduces manual effort, provides quick analysis, and delivers personalized suggestions. Additionally, the system can be further enhanced by integrating real-time industry data and advanced machine learning algorithms to improve accuracy and performance. Thus, SkillSync serves as an effective tool for identifying skill gaps and supporting career development.

Conclusion:

In this paper, an AI-based skill gap analyzer named SkillSync has been successfully developed to address the problem of mismatch between student skills and industry requirements. The system uses machine learning and natural language processing techniques to extract, analyze, and compare user skills efficiently. It provides personalized recommendations that help users improve their competencies and enhance employability. The proposed system is simple, efficient, and user-friendly, making it suitable for practical use. In the future, the system can be improved by incorporating advanced algorithms and real-time data to provide more accurate and dynamic recommendations.

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