

Original Article

Ideaspire: Students Project Recommendation System

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Abstract - In the critical last year of a four-year degree engineering program, choosing an appropriate project can represent the deciding moment of the graduation experience. Conventional strategies frequently leave undergraduates attempting to distinguish a theme that lines up with their inclinations, skills, and boss mastery. This study proposes a clever methodology using AI to upset the last undertaking point choice. By utilizing a cooperative separating calculation, the framework dissects understudy profiles - enveloping interests, abilities, and manager connections - close by an immense store of past venture information addressed by watchword records. This permits the framework to distinguish solid connections between understudy profiles and past tasks, at last suggesting points with a serious level of personalization. Past simple subject ideas, the examination digs into laying out a system that corresponds understudy scholarly qualities with project types. This structure determines the proposed framework and, in addition holds the possibility to develop the general last task insight further. The center point is to streamline the interaction by limiting sitting around and guaranteeing major areas of strength between understudy capacities and task requests. This approach can smooth out the last task venture, lessen understudy disappointment, and eventually add to a higher achievement rate for graduating undergraduates.

Keywords - Education, Project selection, Natural Language Processing (NLP).

1. Introduction

Choosing an engaging and doable final project topic is a crucial obstacle for graduating students in the crucial last year of a bachelor's degree. Conventional approaches frequently result in an unsatisfactory situation. Students struggle to match a good project with their supervisor's knowledge, personal abilities, and academic interests.

This mismatch might result in time lost and the depressing sensation of having to change the subject midway through. Though certainly important, the current deluge of historical final project records in university libraries can further overwhelm students in the research stage. This study offers a ground-breaking strategy to transform choosing final project topics by utilizing machine intelligence [1].

Through the use of a collaborative filtering algorithm [2][3], the system explores student profiles that include interests, competencies, and supervisor affiliation in addition to a large database of previous projects that are represented by keyword lists. The algorithm finds substantial links between student profiles and previous projects thanks to this complex analysis, which in turn suggests themes that are very relevant and personalized [4][5].

This study goes beyond just suggesting a topic. It goes into creating a framework that links various project kinds to

the academic traits of students. This framework can enhance the final project experience in addition to making feature selection for the recommendation system more efficient [6]. The main goal is to streamline the procedure as much as possible by reducing wasted time and making sure that student talents and project requirements are well matched. This methodology possesses the capability to optimize the culminating project process, mitigate student annoyance, and consequently augment the graduation success rate.

2. Methodology

The purpose of this research is to solve the issues of customization and information overload by recommending project topics using a machine learning-driven methodology [7]. The technique comprises multiple pivotal steps [8]:

2.1. Gathering and Preparing Data

The system developed works on the data with two types-

- User Data: We will gather information from user profiles, such as their hobbies, abilities, and, if relevant, any prior project experiences. Surveys, questionnaires, or user profiles already in place within an organizational system can all be used to gather this data.
- Project Data: Project repositories or university libraries will probably be the source of our historical project data collection. Project descriptions, keywords, and maybe



supervisor connections will all be included in this data. The project data will be cleaned and standardized using text pre-processing techniques in preparation for analysis.

2.2. Engineering Features

The data gathered is further processes to extract the features. Here, user profile data that has been gathered will be used for extracting user features.

These might be keywords for skills, interest groups, or (if relevant) subjects from previous projects. The preprocessed project data will be used to extract project features. This will entail extracting pertinent keywords from descriptions and maybe using topic modelling approaches to find themes in the project data.

2.3. Model Selection and Instruction

- The recommendation system's key component will be a collaborative filtering algorithm. Based on past project data, our algorithm finds people with similar profiles and suggests projects that those users have found successful.
- The combined dataset of user and project attributes will be used to train the selected algorithm. During the training phase, the algorithm will be trained to find correlations between user profiles and project characteristics.

2.4. Assessment

Many measures will be used to assess the recommendation system's performance. These could include user satisfaction through surveys or A/B testing, recall (coverage of pertinent projects), and precision (relevance of recommendations) [9]. The evaluation will determine how well the algorithm matches user interests and profiles with project recommendations.

2.4. Implementation and Improvement

After assessment and any adjustments, the finished system will be implemented with an intuitive user interface. This interface might be integrated into an already-existing platform or it might be a web or mobile application.

Constant data gathering and user feedback will be used to monitor and improve the system. The system is kept efficient and adjusted to changing user requirements and project environments thanks to this iterative procedure.

3. Implementation

The project is implemented using Python and android studio. Following are a few screenshots showing the implementation discussed in the methodology section.

Figure 1 shows the login page of the system, and Figure 2 shows the data updation window.



Fig. 1 Login page

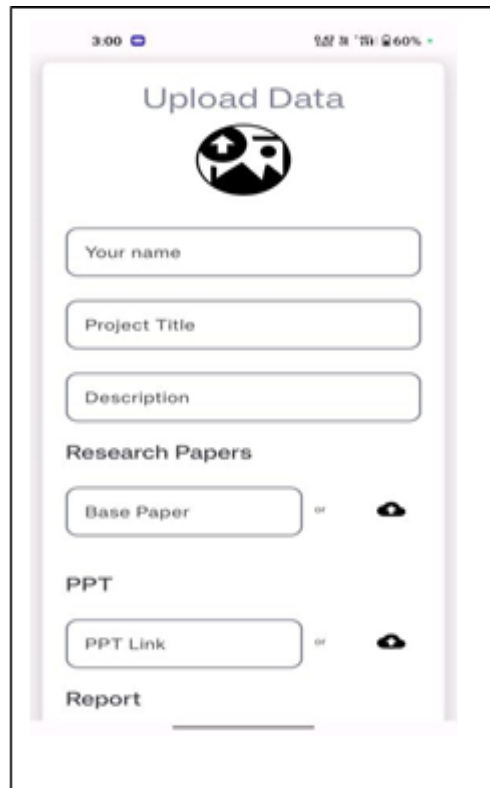


Fig. 2 Data upload

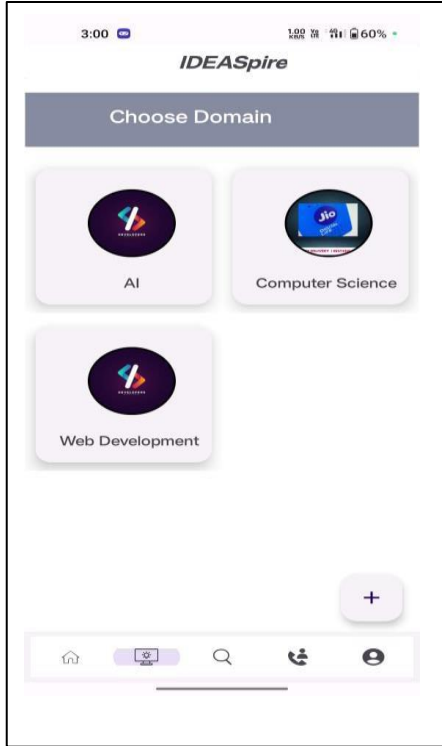


Fig. 3 Searching the domain of the project

Ideaspire focuses on providing ideal project ideas for the students as per their requirements and interests. Figures 3 and 4 represent screenshots showing the search for a project idea.



Fig. 4 Searching for an idea of the project

4. Result

The system developed accomplishes multiple significant features:

4.1. Personalized Recommendations

Based on a student's interests, aptitudes, and supervisor's experience, the system will provide a carefully selected list of project subjects. Through the provision of pertinent options, this tailored method resolves the present problem of information overload for pupils.

4.2. Decreased Time and Resource Waste

Students who use traditional techniques frequently struggle to locate relevant topics, which results in frustration and time wasted. With the help of this recommendation system, students should be able to quickly identify ideas that show promise and shorten the selection process.

4.3. Better User Experience

The system makes it easier for students to utilize by providing a customized list of project themes. They can concentrate their efforts on researching subjects that are in line with their academic goals and move through the project selection process with more clarity and confidence.

4.4. Data-Driven Decision-Making

Data analysis is essential to the system's basic functioning and encourages data-driven decision-making when choosing the end project. The approach gives students and faculty advisors useful insights by finding relationships between student profiles and successful projects.

5. Conclusion

The completion of a bachelor's degree program depends on choosing a final project topic that is both interesting and doable. Conventional approaches frequently cause a disconnect between the goals of the students and the projects that are available, wasting time and demoralizing the students.

In order to overcome this difficulty, this project has suggested a unique, data-driven approach to the recommendation system that makes use of student characteristics and previous project data.

The system provides a multimodal way to maximize the choice of end projects. It reduces information overload and guides students toward pertinent options by creating customized project recommendations.

This expedites the decision process and saves time and money. In addition, the system stimulates research and innovation in relevant approaches and data-driven decision-making in project selection.

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