International Journal of Scientific Research in Engineering and Management (IJSREM)
Volume: 08 Issue: 03 | March - 2024 SJIF Rating: 8.176 ISSN: 2582-3930

Recommendation System for AcademicQueries Using Machine Learning

NAGA LAKSHMI[1]
B.TECH CSE
(Dr MGR Educational And Research Institute, Maduravoyal, Chennai-600095, Tamil Nadu, India)
mandavanaga37@gmail.com

MAMTA KUMARI[2]
B.TECH CSE
(Dr MGR Educational And Research Institute, Maduravoyal, Chennai-600095, Tamil Nadu, India)
mamtak802101@gmail.com

MADHUMITHA[3]
ASSITANT PROFESSOR
(Dr MGR Educational And Research Institute, Maduravoyal, Chennai-600095, Tamil Nadu, India)
madhumitha.cse@dmgrdu.ac.in

Dr.V.SAI SHANMUGA RAJA[4]
PROFESSOR
(Dr MGR Educational And Research Institute, Maduravoyal, Chennai-600095, Tamil Nadu, India)
saishanmugaraja.cse@drmgrdu.ac.in

Dr.G GUNASEKARAN[5]
PROFESSOR
(Dr MGR Educational And Research Institute, Maduravoyal, Chennai-600095, Tamil Nadu, India)
Gunamgrcse@gmail.com

ABSTRACT

One kind of recommendation system that uses human expertise to provide individualized recommendations is the academic query recommendation system. Because the recommendations made by these systems are based on the knowledge and experience of actual people, they are frequently more reliable and accurate than those made by fully automated systems. The following elements are required to create a recommendation system for academic queries: feature extraction and selection, user interface design, data collecting and preprocessing, and recommendation algorithm development. In order to promote student participation and interaction, the system can also make use of social networks and collaboration tools. An expert recommendation system can help college students become more motivated and engaged, perform better academically, and have better career outcomes. The system can benefit universities as well as. There are numerous courses accessible on e-learning platforms; users must choose the one that best suits their needs. Recommendation systems are crucial in enabling users to make better automated course selections. It suggests that consumers choose the option of their choice according to their preferences. This technology can determine the users' preferences and past usage to determine what they enjoy most. The suggested work might assist students in choosing online courses based on their preferences.

Keywords: Recommendation System, Human Expertise, Machine learning

1. INTRODUCTION

A strong recommendation system may boost revenue, enhance user engagement and experience, and offer insightful data about user behavior. One kind of artificial intelligence system is a recommendation system, which furnishes recommendations to users grounded on their behavior, preferences, and past interactions. With companies trying to tailor their goods and services to each individual

client, this technology has grown in significance in recent years.

Recommendation systems create customized recommendations by analyzing data using a machine learning algorithm. These systems have been demonstrated to raise customer satisfaction and boost revenue and are used in a variety of industries, including healthcare and e- commerce. Recommendation systems can help students make educated decisions about their academic and professional pathways. These systems can, for example, advise courses depending on a student's academic standing and career goals, offer internship or job search options in a particular industry, or suggest professional development resources and networking events. Colleges and universities can potentially benefit from these systems by seeing increases in student engagement and retention rates. Students might feel more a part of their academic community and be more successful both academically and professionally if they receive tailored suggestions. In higher education, recommendation systems are growing in popularity in this age of digital revolution. They are not only user-friendly and accessible to a diverse spectrum of students, but also efficient and effective. All things considered, an expert recommendation system for academic queries can improve the learning process by giving students the resources necessary for them to manage their education and realize their long-term professional objectives.

2. LITERATURE SURVEY

[1] The paper covers various deep learning approaches such as neural collaborative filtering, autoencoders, and deep cross networks, and it discusses their strengths and weaknesses. The writers also talk about the difficulties and opportunities for deep learning in recommender systems, and they provide insights into future research directions. All things considered, this work is an invaluable tool for anybody curious about the use of deep learning techniques to recommendationsystems.

[2] Feng Liu, Xingyu Li, Liqiang Nie, et al.Published in: Proceedings of the IEEE, 2020: This paper provides profound reinforcement learning (PRL) for suggestion systems: an exhaustive survey which have gained growing interest in recent years because of their capacity to learn from user feedback. The paper covers different DRL-based recommendation algorithms, such as deep Q-networks and actor- critic methods. All things considered, this work offers a helpful summary of the state-of-the-art in DRL- based recommendation systems.

[3] Ali Alshehri and Walaa Eldin Moustafa Published in: Expert Systems with Applications, 2021: This paper provides a comprehensive survey of recommendation techniques based on machine learning, covering different types of recommendation approaches, such as joint selection, substance-driven selection, and amalgamated selection. The paper also discusses different techniques and algorithms that are employed in recommendation systems, encompass profound understanding, array decomposition, and graph- based approaches. In addition, the paper reviews different evaluation metrics used to evaluate recommendation systems, such as precision, recall.

[4] The intention of this investigation is to examine the various literary pieces on suggestion systems (RSs) that categorize, furnish statistics, and aid e-learning of the scrutinized pieces according to their suggestion objectives, suggestion methodologies, target user, and application platforms. By presenting an outline of contemporary exploration and standard and nontraditional suggestion methodologies to deliver varied suggestions for prospective e-learning, the survey notably progresses the domain of e-learning RSs.

[5] A Survey of Expert Recommendation Systems: Techniques, Applications and Challenges" by Xiaohui Tao, Wei Zeng, and Xiaohua Hu. This paper provides a comprehensive survey of expert recommendation systems, including various techniques, applications, and challenges. It discusses various kinds of expert recommendation systems, encompassing content-driven and cooperative selection filtering, and hybrid approaches. It also provides a comparison of different evaluation

metrics used in expert recommendationsystems.

[6] Expertise Recommender: A Flexible Recommendation "System and Its Evaluation" by Pablo Ivìan Cantador Castells, and David Vallet. This paper presents an expertise recommender technology that provides consumers personalized specialist guidance. Grounded on the user's profile and conduct, the framework suggests specialists by merging substance-driven and cooperative selection approaches. An all-inclusive examination of the system's efficacy is also integrated in the piece.

[7] An amalgamated selection-driven specialist suggestion structure for E-Learning" by Xinyue Liu, Jianfeng Wang, and Xiaodong Liu, published in IEEE Transactions on Education in 2020. This paper proposes An amalgamated selection-driven specialist suggestion structure for e-learning, which uses a matrix factorization algorithm to predict user preferences andrecommend suitable experts.

[8] A Hybrid Expert Recommendation System for Online Recruitment" by Sajjad Hussain and Muhammad Azhar, published in IEEE Access in 2019. This paper proposes a hybrid expert recommendation system for online recruitment, which merges cooperative selection methodologies with substance-driven selection to propose suitable experts to job seekers.

[9] A Survey on Expert Recommender Systems: Approaches, Challenges and Future Research Directions" by N. Noura, et al. is a comprehensive survey paper that provides an overview of expert recommendation systems. The paper covers various approaches to developing expert recommender systems, including Instance-driven reasoning, wisdom- driven frameworks, and amalgamated arrangements. The authors also additionally talk about the drawbacks and restrictions of these approaches and provide insights into prospective future research domains. The paper was published in the IEEE Access journal in 2021 and is a valuable resource for anyone interested in the development of expert recommender systems.

[10] Expertise recommendation in social networks using hybrid filtering techniques" by Mohamad Hassouna et al. (IEEE Transactions on Computational Social Systems, 2019). This paper proposes a hybrid filtering approach for expertise recommendation in social networks, which combines content- based and social- based filtering techniques. The paper evaluates the proposed approach using a dataset from the LinkedIn social network.

3. OBJECTIVE

The project's objective is to establish a unified platform for all the queries related to students. Where users no need to worry about finding the right person to solve their queries.

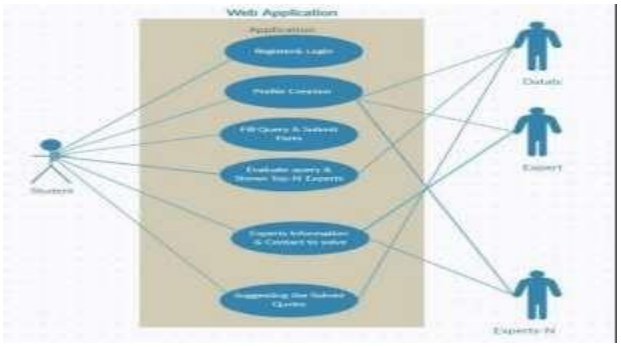
4. ALGORITHM

.Collaborative filtering, notably user-based collaborative filtering, is one of the most often used methods for creating Top-N recommendation systems.
•This is the pseudocode for a basic collaborative filtering system that uses user input.

• A recommendation system that, given a user, can produce the top-N recommendations; this algorithm works under the assumption that user ratings are kept in a dictionary.
• In this scenario, user IDs serve as the keys, anditem IDs and ratings serve as the values indictionaries.
• In a recommendation system, this is how user-item ratings are often represented.
• Although different similarity metrics can be employed, the algorithm assumes that the Pearson correlation coefficient is the measure of similarity between users.
Lastly, the user's size might be taken into consideration while selecting the value of K.

5. METHODOLOGY

Use case diagram



Description : The use case diagram may include the following steps:

Student sends a request: The student asks for advice on a particular subject or problem.

The system looks for experts with relevant experience and knowledge in the student's field of interest. It then recognizes these experts.

The system displays suggested experts: The student is given a list of suggested experts by the system, along with information about their backgrounds and specializations. The pupil chooses an authority: From the system's list of suggested experts, the student chooses one.

System sends request to expert: The system makes a request to the chosen expert, requesting their advice and insights into the problem or subject that the student has indicated.

An expert makes suggestions: The specialist gives the pupil advice and insights based on

6. MODULE DESCRIPTION

User based collaborative filtering

Module Description: User-based collaborative filtering; User Corpus: Database containing all user information.

Generation of Candidates: We will filter the data in this stage and retrieve pertinent info from the database.

Ranking: Out of all the Users that are available, we are using the Cousin similarity algorithm to rank the best Expert.

Data Format

Query Form

User Contribution

Title: The query's title.

2. Description: An overview of the problem.

3. Tags: Tags pertaining to Q

7. COMPARSION OF EXISTINGAND PROPOSED SYSTEM

Existing system: Within the current system, the current system The current generation of expert recommendation systems is based on content- or rule-based filtering. With the rule-based approach, the user's query is used to choose which experts to recommend from a predetermined set of rules. The system suggests experts in the content-based filtering method depending on how closely the expert's profile and the user's query match.

Proposed system: The suggested expert recommendation system employs an amalgamated tactic merging cooperative and substance-driven selection. To determine which experts are most pertinent, the algorithm examines user inquiries, their context, and previous exchanges. To increase the accuracy of the suggestions, it also considers the user's preferences, knowledge, and comments.

The suggested system analyzes a lot of data using machine learning algorithms.

8. CONCULSION

Students will receive tailored suggestions from an expert recommendation system in a college system, assisting them in making selections regarding their education. Machine learning algorithms will form the foundation of the system, analyzing student data and producing recommendations.

according to prior student experiences. Students will be able to maximize their educational experience and meet their academic objectives with the aid of this system.

Additionally, an expert recommendation system receives a user topic or query and returns a list of individuals ranked according to how much they know about the topic at hand. Expert recommendation technique grounded on past conduct, algorithms forecast a client's present inclinations for specific commodities and deliver tailored service assistance.

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