

INCORPORATING THE USER'S SOCIAL FEATURES IN PERSONALITY AWARE PRODUCT RECOMMENDATION SYSTEM

V Lavanya #1, K Naga Sai Avinash #2, K Bhargavi #3, K Kala Sarvani #4

#1Asst. Professor, #2,3,4,5 B.Tech., Scholars

Department of Computer Science and Engineering,

QIS College Of Engineering and Technology

Abstract:

Any platform that facilitates contemporary online purchasing or social networking must have a recommendation system as an essential component. The product recommendation system, which serves as a prototypical illustration of an older generation of recommendation systems, is plagued by two significant drawbacks: suggestion repetition and unpredictability about new goods (cold start). These restrictions are a result of the fact that legacy recommendation systems only take into account the user's prior purchasing patterns when making recommendations for new products. It is possible that including the user's social attributes, such as their personality traits and topics of interest, can help ease the cold start and reduce suggestion repetition. As a result, we present a system called Meta-Interest in this paper. It is a personality-aware product recommendation system that is based on the mining of user interests and the finding of metapaths. Even if the user's history does not include the goods in question or others like them, Meta-Interest is still able to make predictions on the user's interests and the objects that are related with those interests. This is accomplished by first determining the user's subject interests and then, ultimately, proposing goods that are linked with those interests to the user. The proposed system takes into account the user's personality characteristics in order to make predictions about the subjects that would be of interest to the user, and it also attempts to link the user's personality facets with the things that are related with those qualities. Recent recommendation approaches, such as deep learning-based recommendation systems and session-based recommendation systems, were used as benchmarks to evaluate the proposed system's performance. The findings of the experiments indicate that the technique that was proposed has the potential to improve both the accuracy and recall of the recommendation system, particularly in cold-start environments.

1) INTRODUCTION

The subject of study known as "personality computing" is an example of an interdisciplinary field of research that focuses on the integration of ideas from the field of personality psychology with computer systems. It has been shown that making use of

personality theories might be useful in addressing some of the more well-known challenges in the field of computer science. Computing based on personality has found use in a variety of fields and lines of investigation, and over the course of the last ten years, the field of personality computing has seen a significant rise in the number of academic papers devoted to the topic. The incorporation of user personality traits into the computing system has resulted in the creation of new research avenues, such as automatic personality recognition, and has also assisted in the acceleration of previously established research avenues, such as research on recommendation systems and human-robot interaction. Personality computing has made it possible for recommendation systems to get a deeper understanding of the preferences of its users from a new angle. There has recently been the development of a novel form of recommendation system that makes use of the user's personality attribute in order to provide better suggestions. Personality-aware recommendation systems are the collective name for this category of systems. The issue that has been plaguing traditional recommendation systems may now be effectively addressed thanks to this innovative form of recommendation system. To mention only a few examples, there is the "cold-start" issue, which occurs when the system does not have a lot of data about the preferences of the user; the "free-riders" problem; and the "data sparsity" problem. The last several years have seen a fast expansion of personality-aware recommendation algorithms, which is something that we have observed. However, despite the fact that all of these recommendation systems take into account the user's personality traits during the process of making recommendations, these systems make use of a variety of different recommendation strategies, and they are tailored for a variety of different types of recommended content. Because of this, the purpose of this work is to undertake a thorough assessment of the previous research on personality-aware recommendation systems.

2) **RELATED WORK**

Traditionally speaking, recommendation systems may be broken down into three primary categories: collaborative filtering techniques, content filtering approaches, and hybrid filtering approaches. The idea of collaborative filtering comes from the observation that "those who agree on the past, presumably will agree in the future." [Citation needed] In practise, collaborative filtering systems discover a group of users who have a comparable rating with user u_x ; these people are referred to as the neighbours of user u_x . This allows the system to propose new things to the user u_x . Following the discovery of the group of neighbours, the system then locates the set of things that have a high rating among these neighbours. It then makes a recommendation of these products to the user known as u_x . Calculate the degree of similarity between the things that have been previously matched and the items that are being proposed, independent of the ratings that the items' neighbours have given them. Last but not least, hybrid approaches are ones that make use of a mix of these two methods. The only difference between conventional

recommendation systems and personality-aware recommendation systems is that the latter include the user's personality information in the process of making recommendations, while the former do not. Both types of recommendation systems use similar recommendation techniques. Figure 1 and Figure 2 illustrate the primary distinctions between traditional recommendation systems and those that take the user's personality into account. The typical structure of recommendation systems is comprised of three steps. To begin, there is the phase of rating, in which the user indicates the objects in which she is interested by giving them ratings. The second step is the filtering phase, which may either use collaborative filtering, content filtering, or hybrid filtering, as was discussed before. In the last stage, known as the recommendation phase, the system makes suggestions on the products that were produced by the filtering phase.

Figure 2 demonstrates how personality-aware recommendation systems alter the filtering step and add two more stages before the rating phase. Additionally, these systems add two more phases before the rating phase. During the phase referred to as the "personality measurement," the system either asks the users to complete a personality assessment questionnaire as part of the registration process or applies an automatic personality recognition scheme to the users' previously collected data, such as that from their online social network accounts. This allows the system to determine the users' personality types. The system will attempt to match the personality type of the user with relevant items while it is in the personality matching phase. This could be done through lexical matching, which involves linking the textual description of the items with the personality types that are associated with those items, or through the use of fine-grained rules that can match items with personality types. It is important to note that when the system is in the phase of personality matching, it does not have any information about the ratings that users have given. These ratings help to mitigate the effects of the cold-start problem, which is considered to be one of the most difficult problems in the literature of recommendation systems. Personality-aware recommendation systems further alter the filtering phase by using the user's personality information in the similarity assessment that determines whether other users are considered to be their neighbours.

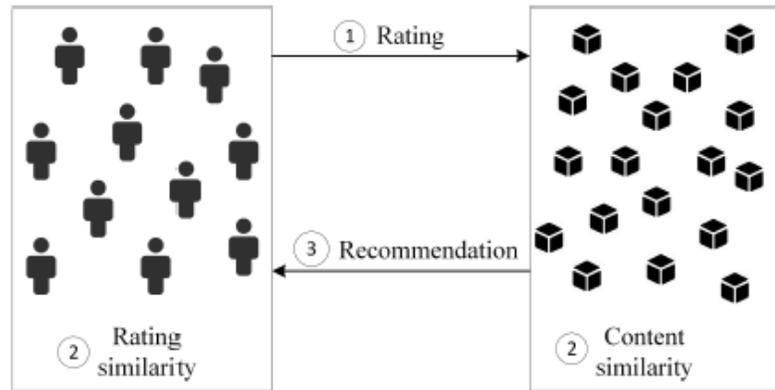


Fig. 1: Conventional recommendation systems

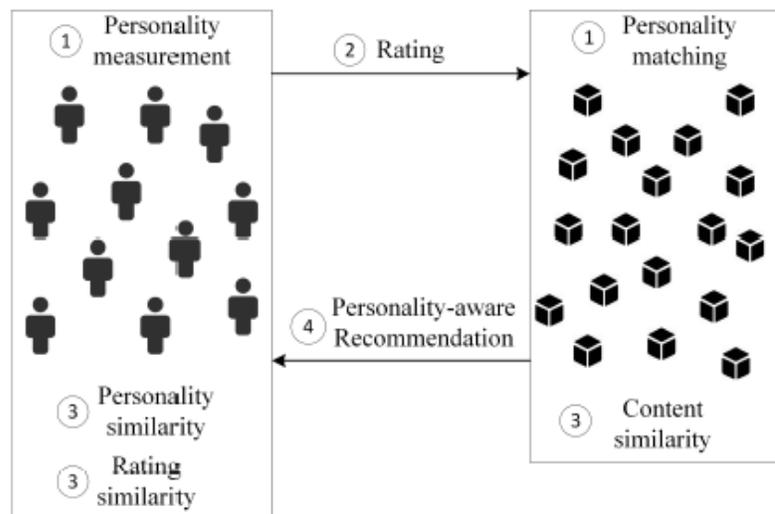


Fig. 2: Personality-Aware recommendation systems

3) SYSTEM ANALYSIS

Product recommendation systems, which are a classic example of legacy recommendation systems, suffer from two key drawbacks: suggestion redundancy and unpredictability about new goods. [Case in point:] product recommendation systems. These restrictions are a result of the fact that legacy recommendation systems only take into account the user's prior purchasing patterns when making recommendations for new products.

Drawbacks

- Because it does not make advantage of user interest mining and personality computing, the system's overall effectiveness is diminished.
- Cold start issue

Proposed System

We present a system called Meta-Interest, which is a personality-aware product recommendation system based on the mining of user interests and the identification of

meta-paths. Even if the user's history does not include the goods in question or others like them, Meta-Interest is still able to make predictions on the user's interests and the objects that are related with those interests. The user's subject interests are analysed in order to accomplish this goal, and the results of the analysis are ultimately used to provide product recommendations to the user. The proposed system takes into account the user's personality in two different ways: first, it uses the user's personality traits to make predictions about the topics in which he will be interested, and second, it uses those personality traits to match the user's personality facets with the associated items. The recently proposed system was evaluated in comparison to more contemporary recommendation approaches, such as session-based recommendation systems and deep learning-based recommendation systems. The results of the experiments indicate that the proposed strategy has the potential to improve both the accuracy and the recall of the recommendation system, particularly in cold start environments.

- Gets around the difficulty of starting from cold.
- The use of user interest mining and personality computing makes this system more efficient, which contributes to its overall effectiveness.

4) IMPLEMENTATION

Web Image Server

In this section of the course, the Web Image Server will require a valid user name and password in order to log in. After a successful login, he will be able to perform certain operations, including viewing users and giving authorization. You can look at the Sellers and give authorization here. View the request made by the user and generate a secret key utilising RSA. Add Image Category, View All Categories, and Add Image Category View all photographs of clothing, along with ratings and comments from other customers, as well as a list of all items that customers have purchased. View all photos of Cloth along with their rankings on the chart, View all of the keywords together with their rankings on the chart, as well as view all of the numbers of feedbacks for each fabric along with their ratings. Users may be seen and authorised.

Within the scope of this module, an infinite number of Sellers are available. Before carrying out any activities, the manager is required to register. After the Seller has successfully registered, their information will be saved in the database. After his successful registration, he will be required to log in using the user name and password that he was assigned. After a successful login, the seller will be able to perform a number of operations, including viewing their profile, adding new cloth images, viewing all cloth images along with scores and feedback, giving the option to view similar images when clicking on a particular image, giving the option to update their content but not their

images, and viewing all user purchases along with all relevant information and their total bill.

Online Seller

Within the scope of this module, an infinite number of Sellers are available. Before carrying out any activities, the manager is required to register. After the Seller has successfully registered, their information will be saved in the database. After his successful registration, he will be required to log in using the user name and password that he was assigned. After a successful login, the seller will be able to perform a number of operations, including viewing their profile, adding new cloth images, viewing all cloth images along with scores and feedback, giving the option to view similar images when clicking on a particular image, giving the option to update their content but not their images, and viewing all user purchases along with all relevant information and their total bill.

Users

It has been determined that n people are currently logged in to this particular module. Before doing any activities, the user must first register. The information of the user will be saved to the database as soon as they have registered. After his successful registration, he will be required to log in using the user name and password that he was assigned. After successfully logging in, the user will be able to do actions such as seeing their profile and managing their account. Make a request for the secret key in order to search for photographs, and only read the secret key if it was produced on this page. Enter the secret key to search for photos of cloth based on the keyword, display just photographs of cloth, provide a clickable option to explore more images of cloth that are connected, solicit comments, and provide the opportunity to buy fabric, and so on. View all search transactions and provide a link that demonstrates the total number of times a term has been searched for. View all of the Clothes that you have Purchased, together with their individual information and the total cost, as well as all of the Products or Clothes that are Recommended.

5) CONCLUSION

In this research, we proposed a personality-aware product recommendation system based on interest mining and meta-path discovery. The system forecasts the user's requirements and the things that are associated with those requirements. The topical interests of the user are analysed in order to provide a products recommendation, which then goes on to propose the goods that are linked with those interests. The aforementioned system is personality-aware in two different ways. First, it makes use of the user's personality

features to make predictions about the areas of interest that he will be interested in. Second, it uses the user's personality to determine which aspects of the connected objects best fit those aspects. The results of the experiments reveal that the proposed system works better than the state-of-the-art methods in terms of accuracy and recall, particularly during the cold start period for new users and objects.

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