Personality aware Product Recommendation System based on User Interests Mining and Meta path Discovery

ABSTRACT

A recommendation system is an integral part of any modern online shopping or social network platform. Product recommendation system as a typical example of the legacy recommendation systems suffer from two major drawbacks, recommendation redundancy and unpredictability concerning new items (cold start). These limitations take place because the legacy recommendation systems rely only on the user’s previous buying behavior to recommend new items. Incorporating the user’s social features such as personality traits and topical interest might help alleviate the cold start and remove recommendation redundancy. Therefore, in this paper, we propose Meta-Interest, a personality-aware product recommendation system based on user interest mining and meta-path discovery. Meta-Interest predicts the user’s interest and the items associated with these interests, even if the user’s history does not contain these items or similar ones. This is done by analyzing the user’s topical interests, and eventually recommend the items associated with the user’s interest. The proposed system is personalityaware from two aspects; it incorporates the user’s personality traits to predict his topics of interest, and to match the user’s personality facets with the associated items. The proposed system was compared against recent recommendation methods, such as deep-learning based recommendation system and session-based recommendation systems. Experimental results show that the proposed method can increase the precision and recall of the recommendation system especially in cold start settings.

**EXISTING SYSTEM**

Yang et al. [4] proposed a recommendation system of computer games to players based on their personality traits. They have applied text mining techniques to measure the players’ Big-five personality traits, and classified a list of games according to their matching with each dominant trait. They have tested their proposed system on 2050 games and 63 players form Steam gaming network. While Wu et al. [5] presented a personality based greedy re-ranking algorithm that generates the recommended list, where the personality is used to estimate the users’ diversity preferences. Ning et al. [6] proposed a friend recommendation system that incorporates the Big-five personality traits model and hybrid filtering, where the friend recommended process is based on personality traits and the users’ harmony rating.

Ferwerda et al. [7] studied the relationship between the user’s personality traits and music genre preferences, they have analyzed a dataset that contains personality test scores and music listening histories of 1415 Last.fm users. Similarly in [8] they conducted an online user survey where the participants were asked to interact with an application named Tune-A-Find, and measured taxonomy choice (i.e. activity, mood, or genre), individual differences (e.g. music expertise factors and personality traits), and different user experience factors. Similarly, Hafshejani et al. [9] proposed a collaborative filtering system that cluster the users based on their Big-Five personality traits using K-means algorithm. Following that, the unknown ratings of the sparse user-item matrix are estimated based on the clustered users.

Dhelim et al. [10] discussed the benefits of capturing the user’s social feature such as personality traits that are represented as a cyber entities in the cyberspace. Similarly, Khelloufi et al. [11] showed the advantages of leveraging the user’s social features

in the context of service recommendation in the Social Internet of Things (SIoT).

Zarrinkalam et al. [12] presented a graph-based link prediction scheme that operates over a representation model built from three categories of information: user explicit and implicit contributions to topics, relationships between users, and the similarity among topics. Trikha et al. [13] investigated the possibility of predicting the users’ implicit interests based on only topic matching using frequent pattern mining without considering the semantic similarities of the topics. While Wang et al. [14] proposed a regularization framework based on the relation bipartite graph, that can be constructed from any kind of relationships, they evaluated the proposed system from social networks that were built from retweeting relationships.

Disadvantages

1) The system less effective since it is not implemented by user interest mining, personality computing.

2) The system doesn’t implement Collaborative filtering (CF) method.

**PROPOSED SYSTEM**

In the proposed system, product recommendation could be formulated as link prediction in HIN [3]. For example, in this system, given the user’s previous rating and topical interest represented in a HIN, the problem is to predict whether or not a link exists between the user and the product (the ball). One of the main challenges of link prediction in HIN is how to maintain a reasonable balance between the size of information considered to make the prediction and the algorithm complexity of the techniques required to collect that information.

Since in practice, the networks are usually composed out of hundreds of thousands or even millions of nodes, the method used to perform link prediction in HIN must be highly efficient. However, computing only local information could lead to poor predictions, especially in very sparse networks.

Therefore, in our approach, we make use of meta-paths that start from user nodes and end up in the predicted node (product nodes in our case), and try to fuse the information from these meta-paths to make the prediction.

**Advantages**

1) Propose a product recommendation system that infers the user’s needs based on her/his topical interests.

2) The proposed system incorporates the user’s Big-Five personality traits to enhance the interest mining process, as well as to perform personality-aware product filtering.

3) The relationship between the users and products is predicted using a graph-based meta path discovery, therefore the system can predict implicit as well as explicit interests.

**SYSTEM REQUIREMENTS**

➢ **H/W System Configuration:-**

➢ Processor - Pentium –IV

➢ RAM - 4 GB (min)

➢ Hard Disk - 20 GB

➢ Key Board - Standard Windows Keyboard

➢ Mouse - Two or Three Button Mouse

➢ Monitor - SVGA

**SOFTWARE REQUIREMENTS:**

* **Operating system :** Windows 7 Ultimate.
* **Coding Language :** Python.
* **Front-End :** Python.
* **Back-End :** Django-ORM
* **Designing :** Html, css, javascript.
* **Data Base :** MySQL (WAMP Server).