

New Prediction Method for Correct Decision Using Authorized Group Members Results

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ABSTRACT: Trust Relationship between users play a vital role in making decisions for social network users. Existing trust relations are often extremely sparse, therefore unknown trust relationship attacks increase attention in recent years. We propose a new technique from machine learning to predict Trust relationships in social network by using K-nearest neighbour Algorithm (KNN) and also we extend our work to classify the messages posted by these identified trusted users on Social Network sites as Interesting or not Interesting posts. The classification of messages to identify the usefulness is done by using two attributes Length of message in number of words and Posting frequency in terms of time difference between consecutive messages from the same sender. We use real-world dataset Epinions to evaluate their performance in trust Prediction.

KEYWORDS: Trust Relationship, Social Network, Interesting Posts, KNN, Classification

1. Introduction

Social Networks enables its users to go online, create and share information in any place at any time .The massive use of social Networks for online activities generates huge volumes of data at an unprecedented rate. Meanwhile the quality of user-generated content varies drastically from excellent content to abuse or spam, resulting in a problem of information credibility [1].

Trust refers to a relationship between a trustor (the subject that trusts a target entity) and a trustee (the entity that is trusted) [2]. With the emergence of more and more online users , different types of social network and online recommendation tools, the users construct their profiles online and maintain their new online relationships with others by social networks. It is possible and common to interact with unfamiliar people; therefore, it is often a question “Should I trust the person?” [3]. since trust relationships makes the basis of communication and transaction between users, identifying trust relations attracts researchers in recent years. When it comes to opinions, we always look out for our trusted friends, which suggest that trust information may be useful to improve recommendation performance.

Trust inference mainly relies on trust propagation techniques, which is in turn based on the implied trust relationships and the structure of social networks. However, the available web of trust is too sparse to apply propagation techniques. In this paper, we predict trust relationships between users more accurately by utilizing both user interaction data from rating information and user personal data from user’s profile. Moreover, it is observed that a user trust relationship can be described in terms of trustee’s good credibility and reputation, or their common interests.

There are three major computational tasks for trust - representing trust, measuring trust and applying trust [4]. A natural and often used way to represent a network is through graphs: in which a vertex corresponds to an entity usually an individual and an edge connects two vertices relationships between the corresponding individuals. The Proposed method solves trust prediction problem by finding the trust relationship among social networks users using the attributes Authority similarity and Interest Similarity. It then uses KNN to identify the messages as Interesting or not Interesting. Product Review Site Epinions Dataset was used for investigation purpose. It is a real world online product review community where its users can rate items and write reviews. This dataset includes user-item ratings, trust and distrust relations, user-review authorship relations and user-review helpfulness ratings.

2. Related Work

Previous work about online trust is mostly based on machine learning, probability and statistics and network structure and semantic reasoning.

Neville,J., et al. [5] developed an unsupervised model to distinguish strong relationships from weak ones. Several research works for inferring trust relationships by analysing features such as different categories: attribute similarity, transactional connectivity, topological connectivity, and network-transactional connectivity. There are also works on critical aspects of social trust consisting of knowledge, reputation, similarity and personality-based

trust. Jin, Y., et al. [6] proposed a general framework taking into consideration not only user's profile information but also interaction activities and activity fields. He measures relationship strengths between different users,

Achim et al. [7] has shown how to implement and learn context-sensitive trust using statistical relational learning in form of a Dirichlet process mixture model called Infinite Hidden Relational Trust Model (IHRTM). SUNNY [8] proposed a new trust inference algorithm that uses probabilistic sampling to separately estimate trust information. Qiuyue., et al. [9] predicted the Trust and Distrust relationships between users in social networks by exploiting user's profile and interaction information and an improved k-nearest algorithm. This formed the basis of our study. Swathi., et al. [10] classified the posts of face book as interesting and not interesting using subjective and experimental evaluation.

3. Framework

Detecting Trusted communities in a network, predicting the links between nodes in the network, have become much studied subjects in social computing. We Identify Trust by using two important attribute Authority similarity and Interest similarity. We propose a novel approach using KNN for inferring trust in social networks. By analysing attributes we construct a new model through value added KNN through which the relationship between users are classified into trust or distrust. We explore the idea of classifying postings and updates in a users-centric community based on the user's perception of their contents as Interesting or not Interesting. We use the Epinions dataset- an online real world product review community.

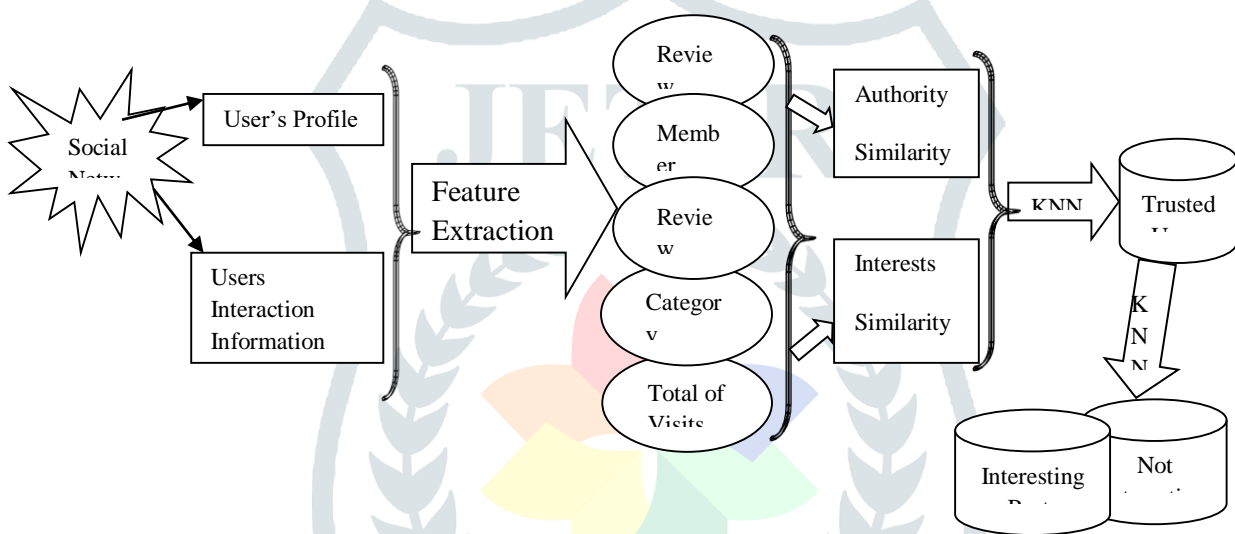


Fig.1. Model for Predicting Interesting Posts from Trusted Users

The whole process is shown in Fig.1. It includes feature extraction, attributes extraction and deducing authority similarity and interest similarity, Identification of trusted users and interesting posts through value-added KNN model. This is a simple approach which may be considered in decision making.

4 Finding Authority Similarity (AS) and Interest Similarity (IS)

The trust relationship between users is based on the influence or authoritativeness of the person. The more Authoritative user is also more creditable. User credibility and user visibility greatly influences authority similarity between users. Moreover, if the authority similarity between two users is large then there is more possibility that they establish trust relationship between them. We Find user credibility (UC) is proportional to users ratings for a given item based on past ratings of other information and User Visibility (UV) is proportional to maximum number the total visits that includes members and non members. We compute user's authority similarity with page rank algorithm using combination of user credibility and user visibility.

Users who have Similar Interest preferences tend to get attracted to each other .Here, we have come up with a method to assess Interest Similarity (IS) by the items they share and review. The common shares or categories of two users are measured along with their own list of interested categories and accordingly Interest Similarity is calculated.

5 Algorithm

5.1 Value-added KNN Classification Algorithm

We propose a Value-added K-nearest neighbor based that assigns different weights to different distances. The algorithm is listed below

Input: Number of nearest neighbours (N); Mean of Distance (M_k); Shortest distance (S_k);
Weight of distance (W_k);Categories (C);

Output: Classification (CC)

Step 1: Mapping of test and training Results into a vector ($V_1 V_2 ..V_m$)

Step 2: Finding the Distance between Test results Vector from category C.

Step 3: Selecting the shortest Distance S_k .

Step 4: Getting the Mean of Distance M_k .

Step 5: Finding the Weight of the Distances W_k .

Step 6: Getting Sum of the Weighted Distances SW_k .

Step 7: Obtain the smallest distance from SW_k .

5.2 Algorithm To Find the Interest Postings of Members:

Input: 2-class training data set of the size x and a test data part t

Output: Based on the classifier result the test data part is set to -1 or +1

Step 1: Based on the classifier, compute test data part to the k nearest neighbour.

Step 2: From the training dataset, calculate the distance $d(i)$ with the i th data part.

Step 3: Sort the distances.

Step 4: Obtain k nearest neighbours to the data part.

Step 5: Set +1 to the data part if the sum of the k values is Positive.

Step 6: Otherwise Set -1 to the data part if the sum of the k values is Negative.
to data part.

By using the two important attributes authority similarity and interest similarity we propose a simple novel approach Value-added KNN for inferring trust in social networks. By analysing attributes we construct a new model through improved KNN. The relationship between users can be classified into trust or distrust. We explore the idea of classifying postings or updates in a users centric community based on the users perception of their contents as interesting or not interesting. We use the Epinions dataset- online real world product review community.

6 Conclusions and Future Work:

In this work, we proposed a simple k -nearest neighbor method for trust classification and post classification. We determine trusted users and their interesting posts in social networks. We used Epinions dataset to implement this algorithm. The classification time with this algorithm is long. So, our future work will use advanced classifier algorithms to find trust and interesting postings. Also in recent years every internet user can be reached via social network, and its growth as the preferred channel for brand discovery and news could be future research direction towards Distrust Prediction.

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