Network Security Situation Evaluation Model Based on User Group Preference

Shujian Cai, Lei JIANG*

Audio-Visual Information Center of Guangdong Food and Drug Vocational College, Guangzhou, China

caisj@gdyzy.edu.cn

*corresponding author

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Abstract: User group preference is an important factor affecting network security. With the development of information technology, higher requirements are put forward for network security. Behind the big data and massive information, different user groups have different choices, creating this rich network era, but at the same time, network security aiming at this preference has become an important topic. Scientists and technicians from many countries in this field have put forward different views, done a series of analysis for the network information security, based on the user group preference and proposed solutions. This paper mainly discusses the network security situation based on the user group preference.

1. Introduction

With the increasing amount of information based on user group preferences, information security problems also arise. For so much important information, how to ensure network security is of great significance in modern life. In the future development process, based on the user group preference, in the network security situation of information fusion, a series of evaluation schemes are established and security schemes are proposed. It can better promote the development of network technology in the future.

2. Analysis of Information Fusion Network Security Situation Based on User Group Preference

2.1 Information Fusion Network Security Situation Based on User Group Preference

With the development of the network, the preference information of the user group has gradually become diversified. It brings people more convenient life and a greater role to the development of science and technology. Considering the needs of people, on the basis of massive data, we can analyze complex data from a diversified perspective, find the key links through a series of characteristic analysis, which can be more conducive to analytic hierarchy process (AHP), create better technology for the current network security situation, bring better development opportunities for network security, ensure information security, and better bring economic benefits to the people.

2.2 Prediction of Information Fusion Network Security Situation Based on User Group Preference

For some prediction of network situation based on user group preference, it is necessary to systematically analyze a large number of data according to the current technology and user needs, so as to better predict the future network security situation. Only by reasonably analyzing and processing the diversity of information and establishing the corresponding model, can we predict the future network security situation and make a better scientific and reasonable analysis of the future big data. In order to ensure the network information security and deal with the huge threat of the current network information security based on user group preferences, it is necessary to develop better storage technology and transmission scheme. While ensuring openness, we can pay more attention to the privacy of information. It is also an important part of the current information fusion

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network security based on user group preferences. In short, in the face of massive information, we must propose a reasonable and scientific hierarchical model, so as to better complete a series of network security related technology improvements and bring better services for people.

3. Use of Network Security Situation Evaluation Model Based on User Group Preference

3.1 Design Scheme of the Network Security Situation Evaluation Model Based on User Group Preference

In the existing network environment, in the network security system based on user group preference, the following points can be taken into consideration. In the process of use, we need to pay attention to a series of security warnings in the host. At the same time, we need to send feedback to the Internet to prompt and prevent a series of potential data security risks, and effectively analyze the information, so as to find the existing or potential network security problems and find out solutions to better serve users with different preference. Therefore, users, data and security analysis all play an important role in the model. Only by the using process can we find out the problems and analyze the network security. Through a series of analysis, they are transmitted to the network security personnel. We can carry out a series of hierarchical analysis on the related technologies, and propose better solutions.

3.2 Use of Network Security Situation Evaluation Model Based on User Group Preference

In the current network security situation based on user group preference, in order to better understand the network security situation, a series of relevant evaluation standards must be established to better protect the network information security. At present, China is making relevant standards, but for China, which only developed Internet technology in recent years, the relevant technical means are not perfect, so we need to learn some advanced scientific knowledge in the west, so as to lay a better foundation for the development of network information technology in the future. In the use of the network security situation evaluation model based on user group preference, three points must be paid attention to. First, it is necessary to analyze the effective preference of different user groups. Only to grasp the different characteristics of these users can better solve the framework of network security situation evaluation model. Second, for different users, it is very important to analyze the data of different time periods and determine the classification of habit selection. Only by mastering the original data of these basic data models can we better use the user group preference network security situation evaluation model. Third, the formation of user preference is analyzed by big data, and it is of great significance to cultivate user preference path and model use until the formation path of these habits is mastered.

4. Basic Algorithm

4.1 Collaborative Filtering Recommendation Algorithm

Collaborative filtering is an early famous recommendation algorithm, and its main function is to predict and recommend [2] the algorithm to find users' preferences by mining users' historical usage lines, divide users into different groups according to different preferences, and recommend products with similar tastes. In short, it is to use historical usage records to divide different user groups and recommend usage records of similar user groups to other users in the same group. Collaborative filtering recommendation algorithms are mainly divided into two categories: user-based collaborative filtering algorithm and product-based collaborative filtering algorithm. Therefore, we will briefly introduce the basic principles and application scenarios of user-based collaborative filtering algorithm. User-based collaborative filtering algorithm is to discover users' attitude and preference to service through their historical behavior data, and calculate the relationship between users on this basis. In this study, user similarity is calculated by mining the relationship between users' historical usage business type tags and usage frequency. The specific business data and tags will be introduced in the data processing section of verification steps in the following chapters.

According to the frequency of different users using the same type of tag service, the relationship between users is calculated, and then business recommendation is made among users with the same preference. In short, if both A and B use x, y, and z services and use them frequently, then A and B belong to the same type of user. You can also recommend the same kind of service A uses to B. Business recommendation has two advantages. First, in the future algorithm processing process, more business lists can be obtained through similar recommendation, so that the model can get better training and prediction results. Second, business list recommendation based on similar interest can effectively improve the user experience, which is also the ultimate goal of establishing user preference evaluation model.

4.2 Introduction to the Basic Algorithm

4.2.1 Collect User Preferences

According to the reflection degree of user preferences in different usage behaviors, the permissions of user preferences are set, and the overall user preferences for a certain type of business are obtained. First of all, we can preprocess the data, including denoising the outliers in the data, normalizing the data, making the data of each behavior unified in the same value range, so as to make the weighted sum more accurate. After data preprocessing, according to different behavior analysis methods, you can choose grouping or weighted processing, and then get a two-dimensional user preference matrix. One dimension is the user list, and the other dimension is the service list. This value represents the floating-point value of user preference between [2].

4.2.2 Find Similar Users

Similarity is used to measure the relationship between different users. The calculation of similarity is based on vector, that is to calculate the distance between two vectors. The closer the distance, the greater the similarity. In the user preference matrix, we take the user preferences for all services as a vector to calculate the similarity between users. From the point of view of finding similar users, it is very important to find users of the same type for the whole algorithm and classify them.

4.2.3 Calculation Recommendation

After obtaining the user similarity, the similarity can be sorted according to the user, and the previous closer user can be regarded as the similar user (neighbor) of the user. The K value can be set in specific experiments. We can obtain the interest list of neighbor users of the research object users, and recommend high similarity service types to users. On the one hand, it can expand the business database of target users, enrich the data set of subsequent experimental modeling and algorithm solving. On the other hand, it can directly present the similarity recommendation results to the end users as an effective subjective factor to improve the quality of user experience.

Therefore, on the basis of objective service quality evaluation model, the subjective characteristics of users are added, such as service content, user interest and so on. On the one hand, users are classified according to their preferences, so as to achieve more effective model training and more accurate service quality evaluation model, reasonably protect users' privacy. On the other hand, personalized user security service recommendation is realized, so as to directly and effectively improve users' QoE.

5. Conclusion

A network security privacy protection strategy based on user group preference is proposed. Compared with the previous objective service quality evaluation strategy, this paper adopts the subjective evaluation model based on user preference, and adds subjective factors to represent the quality of user experience. The collaborative filtering algorithm is introduced to establish the user type preference matrix of business class to realize the division of similar users. By classifying similar users, we can recommend the service of interest to the target user, improve the quality of end-user experience, effectively improve the user experience to train the following models

accurately, so as to achieve targeted privacy protection and ensure the security of the network.

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