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Research on the Method of Value Calculation of Network Science and Technology Information Intelligence Based on Deep Learning

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Abstract: In the process of calculating the value of network technology information intelligence,on the one hand,a calculation method of network technology information and intelligence value based on deep learning is proposed in view of the diversity,dynamic and unstructured characteristics of network technology information and intelligence data.On the other hand,a calculation method of network science and technology information value based on TF-IDF is proposed in view of the problems of"sparse intelligence data"and"limited data dimension"in the processing of network science and technology information data.Through comparative analysis of experiments,it can be seen that the performance of the proposed method on different data sets is superior to the traditional characteristic value calculation method,and it can effectively dig out the hidden potential value information in the data of network science and technology information intelligence.

Keywords: Deep learning;Network technology information;Intelligence value;TF-IDF

1. Introduction

Network science and technology information intelligence is an important part of the national science and technology information resource system,which refers to the data collection based on scientific and technological literature,patents,papers,standards,etc.It is an information resource based on the Internet,which contains a large number of network science and technology information resources that contains important intelligence information.In the process of formulating national science and technology strategic planning,network science and technology information can be used as an important basis to assist the formulation and implementation of national science and technology innovation policies.Therefore,the value calculation of network science and technology information intelligence is one of the important contents of network science and technology information research. At present,many scholars have carried out research work in this field.For example,analyzing journal articles and patent literature can be used to calculate the disciplinary impact of a subject area;The number of patent citations in a certain field is calculated by analyzing patent data.The paper citation rate of a certain subject area is calculated by analyzing the citation of the paper and the situation of being quoted.However,these methods generally have the following problems:Firstly,most studies only focus on static data sets;Secondly,the dynamic change of data set is not taken into account.Finally,different fields may have different research perspectives on the same problem.Therefore,the value calculation method of information intelligence of network technology needs to be further studied and perfected.

As one of the core technologies in the field of artificial intelligence,deep learning has developed rapidly in recent years. Introducing it into the value calculation of information intelligence of network science and technology can not only enrich the value calculation method system of network science and technology information intelligence,but also provide new ideas and new methods for the formulation and implementation of national science and technology innovation policy.Therefore,this paper aims to combine the characteristics of deep learning technology and network technology information and intelligence data,and put forward a value calculation method of network technology information and intelligence based on deep learning.

2. Related Work

With the continuous development of network technology information intelligence,related research is also constantly deepening,and more and more scholars begin to pay attention to the value calculation of network technology information and intelligence.However,the current research on the value calculation of information intelligence of network science and technology is mainly aimed at how to mine and obtain the hidden value information in network science and technology information and intelligence data.And most of them conduct quantitative analysis of data based on statistical theory.The research on the value calculation of information intelligence of network technology is mainly about how to use deep neural network to calculate the information intelligence value of network technology based on the deep learning theory.Some scholars proposed a value calculation method of information intelligence of network science and technology based on deep neural network,which divides network science and technology information intelligence data into two types:text data and picture data,and classifies text data into three dimensions:high-frequency words,low-frequency words and central words.However,due to the inadequacy of text feature extraction and the incompleteness of picture feature extraction,most of the results are calculated based on statistical characteristics in calculating the value of network technology information intelligence.

3. Related Concepts and Definitions

The information intelligence value of network science and technology refers to the value of network science and technology information intelligence and the intelligence value contained in network science and technology information and intelligence.The value of network science and technology information intelligence refers to the potential value information that are obtained through systematic analysis,integrated processing and deep mining of network science and technology information intelligence within a certain space and time range,which are usually expressed in the form of intelligence value rate.

Deep Learning is an artificial intelligence learning method that simulates human brain intelligence,and has been widely used in computer vision,natural language processing,speech recognition,image recognition,autonomous navigation and other fields.TF-IDF is an abbreviation of Term Frequency-Inverse Document Frequency,which is defined as:the score value is assigned to each word when evaluating the relationship between a given word and its context.TF-IDF can be used to evaluate the term frequency and inverse document frequency.In the calculation of information intelligence value of network science and technology,the traditional calculation method of statistical characteristics and TF-IDF are usually used for feature extraction and quantitative evaluation.

4. The Value Calculation Method of Information Intelligence of Network Technology Based on TF-IDF

In order to solve the problems of sparse intelligence data and limited dimension of data in the calculation of information intelligence value of network science and technology,this paper proposes a calculation method of information intelligence value of network science and technology based on TF-IDF.TF-IDF is a text analysis method based on the statistics of word frequency,which mainly calculates the frequency of occurrence of each word and then obtains the frequency of occurrence of the word in the text.The specific calculation steps are as follows:The first is to select a certain number of words as the test word set,and generate corresponding word vectors for them;Secondly,the TF-IDF model is trained on the training set,and then the test words extracted from the test set are matched with the word vector to calculate the similarity between the test words and the test text. Finally,according to the similarity between the test word vector and the test text,the test text is taken as the input vector to calculate the TF-IDF value.In the above calculation process,the larger the TF-IDF value,the more popular the word is,that is,it is endowed with a higher emotional tendency;On the contrary,a smaller TF-IDF value indicates that the word is less popular.Finally,the TF-IDF value is compared with other relevant statistical characteristics.

5. Experimental Results and Analysis

Firstly,we designed an experiment to validate our approach.We select a large amount of network technology information as a training set,and then use our method to calculate and compare the results with the actual value.We found that our method can accurately calculate the value of network technology information intelligence,and compared with the traditional TF-IDF method,our method has a significant improvement in accuracy and efficiency.

Next,we analyzed our experimental results in depth.We find that our method can effectively filter out noisy information and retain valuable information when dealing with a large amount of network technology information,thus improving the accuracy of value calculation of information intelligence.In addition,our method can automatically learn and adapt to the changes of network technology

information,which makes the value calculation of information intelligence more dynamic and real-time.

However,there are some limitations to our approach.Firstly,our method may have computational errors when dealing with some special network technology information,which is mainly because deep learning methods require a large amount of training data,and some special network technology information appears less frequently in the training data,resulting in deep learning models cannot accurately learn.Secondly,our approach consumes a lot of computing resources to calculate the value of network technology information,which is mainly because deep learning methods typically require a lot of computational resources to train and optimize.

6. Conclusion

The work of this paper mainly includes sorting out the work related to the value calculation of information intelligence of network science and technology,putting forward and defining the related concepts,and then elaborating the calculation method of information intelligence value of network science and technology based on TF-IDF.The experimental results show that this method can improve the accuracy and efficiency of calculating the information intelligence value of network technology to a certain extent.

However,there are some limitations to the current study.Firstly,the calculation method based on TF-IDF may not be able to fully adapt to the complex and changeable network information environment.Secondly,the training and optimization of deep learning models still face many challenges.In the future,we will continue to study the value calculation of network technology information intelligence,in order to propose a more efficient and accurate method.

Future research can further consider introducing more complex deep learning models to better adapt to the complex changes of network scientific and technological information.At the same time,it is also possible to try to integrate other machine learning algorithms to improve the adaptability of the calculation method.At present,the training and optimization of deep learning models still face many challenges,such as overfitting and long training time.Future research can focus on solving these problems to improve the training efficiency and accuracy of the model.Integrating domain knowledge into information value calculation can improve the accuracy and efficiency of calculation.Future research can try to mine the knowledge in the field of network science and technology,and apply it to the calculation of information intelligence value.In addition to network technology information,there are many other types of information intelligence,such as text,pictures,audio and so on.Future research may try to explore the value calculation method of multi-source information intelligence to improve the comprehensiveness and accuracy of calculation results.

References:

[1]Jiawei Zheng.Research on Multi-label Chinese Web Page Classification Model Based on Deep Learning of Multiple Information Fusion[D].South China University of Technology,2022.

[2]He Zhang.Review on Evaluation Methods of Information Intelligence Value of Network Technology[J].Wireless Internet Technology,2020,17(16):36-37.

[3]Min Zhang,Huan Liu,Liangping Ding et al.Research on Computing Method of Network Technology Information Intelligence Value Based on Deep Learning[J].Library and Information Service,2021,65(23):70-78.