

## Research on Semantic Recognition Technology of Network Public Opinion and Construction of Recognition Process Based on Artificial Intelligence Method

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**Abstract:** Public opinion analysis is a process of in-depth ideological processing, analysis and discussion of relevant data for social public opinion problems according to specific needs, and obtaining relevant conclusions. The Internet is one of the main carriers of public opinion. In the Internet era, big data and big data analysis skills provide brand-new resources and methods for public opinion analysis and judgment. Understanding the social situation and public opinion through the network and paying close attention to the trend of public opinion will help promote social harmony and stability. There are a lot of network information. How to effectively mine and analyze network public opinion information by using computer network technology, artificial intelligence technology and data mining technology has become a new research hotspot. Thanks to the development of mathematical algorithms and computer science, the machine learning ability in the era of artificial intelligence is increasing. This creates a new opportunity for automation, precision and intelligence in the field of online public opinion analysis. The key point to realize the new requirements lies in the realization of human-computer interaction and two-way coordination in the field of network public opinion analysis, which has important scientific significance for understanding and guiding network public opinion.

### 1. Introduction

With the acceleration of the network process in modern society, the network has become an important channel for people to express their personal opinions and opinions. Internet public opinion information has become a key part of public opinion information[1]. Internet public opinion, as the main carrier of social public opinion, reflects people's thoughts and emotions and is an important basis for orderly guiding social public opinion[2]. Compared with the traditional public opinion, the network public opinion has the characteristics of large amount of data, strong suddenness and wide influence[3]. Under the background of big data environment, it is more difficult and more difficult to standardize the mining of network public opinion information than traditional media[4]. In the face of massive information on Internet public opinions, if the government and enterprises want to guide Internet public opinions in a timely manner, they must quickly grasp the main opinions currently held by the participants of Internet public opinions[5]. Therefore, how to use semantic recognition technology to effectively dig out the key factors from the massive public opinion information and guide decision-making and emergency treatment has become an important direction of public opinion research.

Due to the massive and multi-dimensional characteristics of online public opinion data, the deep value mining of public opinion data has always been one of the bottlenecks in the development of this field[6]. Since the advent of artificial intelligence technology, its research has yielded remarkable results[7]. The rise and practicality of artificial intelligence technology provides a new means and path for us to realize the automation, intelligence and precision of network public opinion analysis by means of artificial intelligence. In particular, the semantic analysis technology in artificial intelligence has developed rapidly in recent years, and has made breakthroughs in many fields such as image recognition, speech recognition, and automatic driving[8]. To this end, some researchers have also made useful explorations, such as using wavelet analysis to decompose the development process of public opinion, and then using artificial neural networks to model and

predict the trend of public opinion[9]. There are also neural network simulations to simulate the development of public opinion, using grayscale prediction and pattern recognition to predict the trend of public opinion and so on. The application of artificial intelligence technology will bring unprecedented changes to network public opinion analysis[10].

## **2. The Concept and Characteristics of Network Public Opinion**

### **2.1 Basic Concept of Network Public Opinion**

With the popularization of the network, the carrier of public opinion is gradually changing into a network platform, which gives birth to the concept of network public opinion. The concept of network public opinion is a common opinion that has certain influence and tendentiousness on the occurrence, development and change of certain social phenomena or social problems publicly expressed by the public on the Internet in a certain network space. Internet public opinion is understood in writing as a situation in which the public spread on the Internet has certain influence and tendentiousness on a “focus” or “hot spot” issue. Incidents Network lyrics refer to information based on emergencies, which contain emotions, attitudes, opinions or behavioral tendencies, published by individuals and groups in the cyberspace through news reports and statements by netizens. Therefore, online public opinion is a collection of all comments, opinions, and opinions about a particular social issue that are transmitted in the network within a certain period of time. This collection reflects the emotional confession of the reviewers, and its extension is broader than the lyrics in the traditional media.

### **2.2 Main Characteristics of Network Public Opinion**

The main characteristics of network public opinion are freedom, interaction, universality, concealment and suddenness. In theory, the network is completely free. Each user is not only the receiver of the information, but also the publisher of the information. Users can express their opinions and opinions without obstacles through the network platform. Due to the convenience of network communication, users will also pay attention to the views of other users when making their own comments. When the viewpoints are inconsistent or contradictory, there will often be interactive discussions of viewpoints. And this kind of mutual communication can maximize the user's point of view. It is widely reflected in the variety of vector forms of online public opinion information and the extensive discussion of online public opinion information. The topics discussed relate to all aspects of social life. Due to the anonymity of the network, people can speak freely and express real thoughts and emotions. But at the same time, it has brought some emotional venting, as well as the release of false information with ulterior motives, causing a bad public opinion impact.

## **3. Semantic Recognition Theory and Technical Analysis of Internet Public Opinion**

### **3.1 Semantic Recognition Theory**

Semantic recognition theory includes semantic grammar and ontology. Semantic grammar is a concept of grammar that has nothing to do with context. The difference between semantic grammar and common syntactic grammar is that non-terminators in semantic grammar are given domain semantics. Semantic grammar can include non-terminators at syntactic and semantic levels or only non-terminators at semantic level. Semantic grammar is a concept different from syntactic grammar. Semantic grammar includes not only syntactic information but also semantic structure. The sentence structure and semantic information of the network lyric text described by the semantic grammar can directly generate semantic interpretation from the analysis result, which is the basis for accurate semantic recognition of the network lyric text. The application of ontology on the network has led to the birth of the Semantic Web, which is expected to solve the semantic problems of network information sharing and realize the integration of knowledge-level information worldwide. Ontology construction is a semantic analysis process. The framework of the ontology is inseparable from the semantic analysis. The various parts of the ontology construction can have semantic

analysis and recognition participation.

### 3.2 Analysis of Semantic Recognition Technology

The key technologies of semantic identification of network public opinion information include collection technology, pretreatment technology, topic identification technology, etc. At present, the technology applied to network public opinion information acquisition is mainly web crawler technology. Web crawler, also known as web spider or web robot, is a program or script that automatically captures web information according to certain rules. As a tool to assist people to retrieve information, the universal web crawler has become a portal and guide for users to access the Internet. It enables people to obtain network information relatively quickly. Data preprocessing technology refers to a series of processing tasks such as cleaning, integration, conversion, discretization and reduction of the original data before the main work of data mining. The minimum specifications and standards required by the Knowledge Acquisition Institute to achieve the mining algorithm. The online lyric topic recognition technology classifies the input content into different topic categories and creates new topics when needed. The application of semantic recognition technology in network public opinion analysis is shown in Figure 1 below.

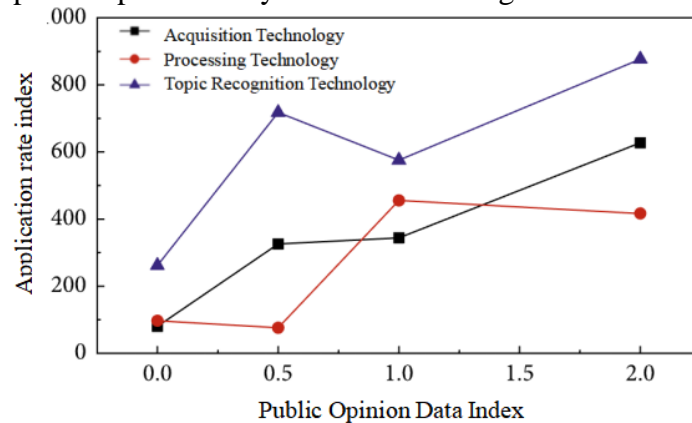


Fig.1. Application of Semantic Recognition Technology in Network Public Opinion Analysis

## 4. Process Construction of Semantic Recognition of Network Public Opinion

### 4.1 Framework Construction of Semantic Recognition Process of Network Public Opinion

Information collection is the first step in the analysis and analysis of network public opinion. It is the process of obtaining public opinion related data from the network platform. In the process of information collection, attention should be paid to filtering duplicate pages and eliminating some information that does not have analytical value. The collected information is then stored in a database as a data source for further analysis. The next step is preprocessing, which is mainly divided into two processes: word processing and key feature extraction. Topic identification is a step after text preprocessing. The work of network public opinion topic identification is often done by cluster analysis algorithm. The last step is the feedback of the results. Through the analysis of emotional intensity, the hot topic of sensation is identified and the public opinion warning is made in time, and the public opinion guidance strategy for different situations is summarized and provided to the user for reference selection. In addition, the organizational structure of the process of network public opinion semantic recognition analysis can be roughly divided into three levels: computing layer, output layer and storage layer.

### 4.2 Network Public Opinion Information Collection Module

The preprocessing module of network public opinion shows that the essence of the semantic recognition process of network public opinion is a data mining process. Web pages crawled by crawlers are a collection of unstructured and disordered data. It is necessary to use certain methods to extract information from the web pages and reasonably understand the documents so that they

can be processed by computers. At present, the research on mining mainly focuses on mining technology, mining algorithm, mining language, etc. In the massive original data, there are a large number of messy, repeated and incomplete data. It seriously affects the efficiency of data mining algorithms and may lead to the deviation of mining results. The task of the pre-processing part is mainly to extract, integrate and integrate the data obtained by the web crawler, and to limit the problem, remove the noise specification data, and improve the mining precision. The essence of the sentiment orientation analysis of online public opinion is a process of identifying and analyzing the subjective position held by information. At present, the sentiment orientation analysis of online public opinion information mainly focuses on the text carrier. The distribution of the network public information collection module is shown in Figure 2 below.

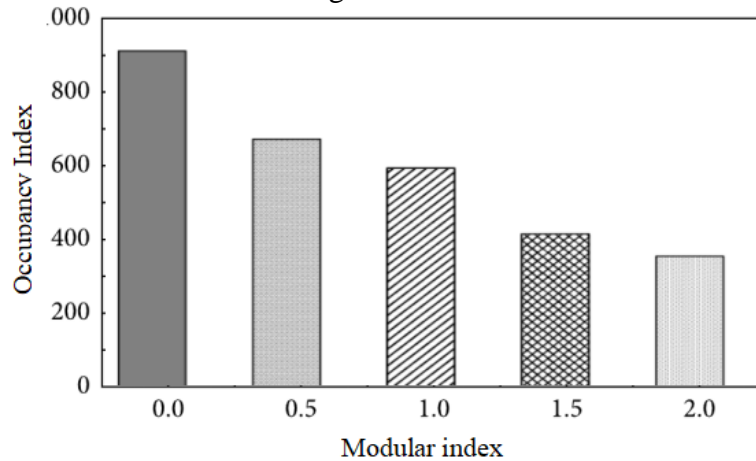


Fig.2. Distribution of Network Public Opinion Information Collection Module

## 5. Application of Artificial Intelligence in Network Public Opinion Analysis

### 5.1 Synergy of Machine Tips and Manual Selection in Topic Prediction

Artificial intelligence is an application based on mathematical models and computer support. Its kernel relies on causal logic and probability statistics. However, there are many things in real life that do not really operate according to causal logic. In many cases, AI relies on probability to predict the direction of things, but not everything has enough precedents to learn. It is difficult to predict public opinion according to causal logic. To make a correct prediction, we can only rely on enough finished public opinion topics as the object of machine learning to find their probability characteristics. In a certain range of prediction proposals, human wisdom is needed to analyze and judge, and to find out the paradox that there is a possibility of further fermentation. At the same time, such manual selection behavior requires a complete record as a training set for further learning of the machine for the next public opinion prediction reference. This model of human-computer interaction can enhance the ability of machine learning, so that artificial intelligence can gradually reach a higher level and provide assistance more intelligently.

### 5.2 Experience and Quantification of Expert Bank

It is recognized in the skill field that manipulating machines for emotional analysis is much more difficult than truth analysis. The machine can learn to analyze sentence components through word segmentation and repeated training of training sets, but it is extremely difficult for the machine to judge subtle emotions and ironic rhetoric. In view of this, in the process of sorting out and analyzing public opinions, artificial intelligence's ability to understand the truth can be upgraded to a level comparable to that of human beings. However, it is difficult to reach the level of human understanding for the emotional judgment of public opinion. In the Internet age, emotion is a very important logic. The fermentation and diffusion of many Internet events have the shadow of emotional appeal. Occasionally, emotional appeals and even beyond the demands of reason have become an extremely important factor in the public opinion. Therefore, in the countermeasures of

public opinion analysis, the truth of the combining can be provided by the machine, but the countermeasures and suggestions always rely on the experience of experts. Of course, quantifying the experience in the expert pool can provide supplementary advice for similar resentment, and gradually make the machine's intelligence provide a higher level of consulting assistance.

### **5.3 New Paradigm of Network Public Opinion Analysis under Artificial Intelligence**

Human-computer interaction is an important logic for artificial intelligence applied to network public opinion analysis. Combining the existing network public opinion analysis mode and process, as well as the skills support of each link, we propose a new paradigm for network public opinion analysis supported by artificial intelligence skills. That is to follow the basic direction from the real problem to the quantitative modeling to the conclusion of the conclusion. In each detailed step, the principle of human-computer interaction and synergy is followed to effectively apply artificial intelligence skills. It should be said that the realization of artificial intelligence benefits from the scientific community's attempt to quantify the entire world. The scientific community has tried to build models to express the complex and objective world and has achieved many achievements. These achievements have inspired the development of the “computationalism” philosophy to a certain extent, and those who believe in computationalism believe that the world can be quantified to a great extent. Therefore, artificial intelligence can be closer to humans than we think. But there are far more problems in our world that cannot be quantified than those that can be quantified. In the artificial world, the complexity of human beings far exceeds the ability of human beings to fully grasp their own imaginations and skills.

## **6. Conclusion**

Social public opinion and ideological work cannot be separated from scientific guidance and rational support of academic research. We should make full use of artificial intelligence technology and big data analysis methods to establish a more efficient, scientific and accurate comprehensive public opinion research and analysis system. In particular, optimize the methodology for studying netizens' emotions, attitudes, attribution logic and behavior prediction. Human-computer interaction is an important logic for the application of artificial intelligence to network public opinion analysis, following the basic direction from realistic problems to quantitative modeling and then to exploration conclusions. Follow the principle of human-computer interaction in every aspect. In addition, an interdisciplinary approach to the intersection of the arts and sciences of scientific research is encouraged. The system of artificial simulation is established by using the system of “sentimental simulation” to strengthen the level of public opinion judgment and risk warning, and improve the ability of network ideology guidance. In the era of artificial intelligence, we must do a good job in public opinion and ideology. We must not only promote the mainstream ideology based on the support of advanced communication technology, but also do a good job of contradictory resolution, interest coordination and social fairness and justice maintenance. Related work.

## **References**

- [1] Shen H L, Bao F X. Internet Public Opinion Recognition and Tracking Based on Web Mining[J]. Advanced Materials Research, 2014, 989-994:4909-4912.
- [2] Wu, Li G. Research on Mining and Classification of Public Opinion Mining Based on Semantic[J]. Applied Mechanics and Materials, 2014, 687-691:1218-1222.
- [3] Chen J. Research on the Effectiveness Model of Four-Level Response System of Network Public Opinion Based on Random Distribution Rules and Linear Function[J]. Lecture Notes in Electrical Engineering, 2014, 12(1):200-209.
- [4] ZhuHaihua, LiJing, WangYingcong. Knowledge Representation and Semantic Inference of Process Based on Ontology and Semantic Web Rule Language[J], 2017, 34(1):72-80.

- [5] Rostami N H, Kheirkhah E, Jalali M. An Optimized Semantic Web Service Composition Method Based on Clustering and Ant Colony Algorithm[J]. International journal of Web & Semantic Technology, 2014, 5(1):1-8.
- [6] Ruixue Z, Guojian X, Yuantao K, et al. Construction of a domain knowledge service system based on the STKOS[J]. Chinese Journal of Library and Information Science, 2015, 8(3):50-61.
- [7] Yumei H, Jiayin Q, Huili L. The Study of Local-world Network Evolution Model Based on Microblog[J]. New Technology of Library and Information Service, 2014, 30:66-73.
- [8] Yongli S, Dong L I, Yue Z. Hot Topics Foundation in Network Forum Based on Entropy[J]. Computer Engineering, 2014, 40(6):312-316.
- [9] Mei N, Lanfang Z. Research on Construction of Uyghur Network Query Expansion Words[J]. Computer Engineering, 2015, 41(4):187-189,194.
- [10] Jin S J, Xu Y M. The Design of Public Opinion Analysis System Based on Topic Events[J]. Advanced Materials Research, 2014, 926-930:2233-2236.