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Problems and Countermeasures in the Informatization of Archives Management in University Library

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Abstract: To improve the level of informatization of university library archives management, the problems existing in the information construction of university library archives management are analyzed and some practical solutions are proposed in this paper. These solutions can effectively reduce the investment in human resources and equipment and facilities and improve the utilization rate of resources for computer application of university library archives management.

Keywords: Library; Archives management; Informatization

Online publication: May 31, 2023

1. Introduction

Under the background of the rapid development of information technology, the information age has come, and with the increasingly close connection between network information technology and people's lives, information technology has penetrated into all walks of life in the society, especially the informatization in the archives management of university libraries. At present, there are still many problems in the informatization of university library archives management. Information resources have become an important basis for the development of social economy and science and technology, especially under the background of the rapid development of information technology. Informatization has become an inevitable trend in the current university library archives management, thus problems in the archives management should be addressed. At present, although the archives management of university libraries have mostly been informatized, but the archives still have not been fully informatized, and information technology has not been well utilized in our country's university libraries archives management. Besides, there are still many shortcomings in the technologies used in our country's university archives management. The application of computer in the archives management of university library can effectively reduce the investment in human resources and equipment and facilities, and the use of advanced computer network technology and highly skilled professionals will be more conducive to improving the utilization of information resources [1-4].

2. Utilization of library resources in China in 2016–2021

The utilization of library resources has been increasing from 2016 to 2020, with an average utilization of more than 10 million times, as shown in **Table 1**.

Table 1. Utilization of library resources in China in 2016–2020

Year	Issue valid library cards (10,000 cards)	Library circulation (10,000 visitors)	Person-times of loan of books and periodicals (10,000 person-times)	Loans of books and periodicals (10,000 copies)
2016	5593	66037	24892	54725
2017	6736	74450	25503	55091
2018	7263	82032	25814	58010
2019	8627	90135	26609	61373
2020	10251	54146	17467	42087
2021	11201	74614	26036	58730

3. Problems in the information construction of archives management in university libraries

3.1. Lack of effective electronic archival resources

The application of electronic archives is a very important aspect in the informatization of archives management. Therefore, it is crucial to address the problems in the application of electronic archives to ensure successful informatization of university library archives management. First of all, the integrity and authenticity of the resources are crucial while using the electronic file system of archives and libraries, or else it will cause great losses to the archives management department [5]. There should be a backup for electronic documents in the university libraries, so it is necessary to strengthen the construction of information security system during the establishment of electronic archive resources [6]. In addition, it is necessary to carry out real-time backup of electronic data, computer terminal data and database information in archives and libraries. Secondly, the security and confidentiality of electronic information technology in the university library needs to be ensured. This is because a university library is a relatively closed and independent environment, hence, if the electronic information technology is used by criminals or stolen, it will cause great losses to the university archives. Moreover, information security protection measures are not well-constructed, the security of electronic archives will be threatened. Finally, we should pay attention to the construction of technical system and corresponding mechanism for the security management of archival resources. In order to ensure the security of electronic documents of archival data in university libraries, it is necessary to establish a perfect database, network security system, confidentiality system, and other related security system.

3.2. Backward concept of management personnel and low quality of staff

At present, the overall quality of Chinese university library staff and archive management personnel are generally low, in which they lack archive management informatization-related professional knowledge and skills, which is also an important reason for the low efficiency and poor effect of archive management informatization. Besides, the application of modern equipment and technology is not enough, with many operations still done manually. There is also lack of professional skills training, learning, and communication opportunities for archive management personnel. In addition, the lack of emphasis on and understanding of archive management led to many problems in the informatization of university library archives management. In short, with the continuous development of science and technology and socioeconomic status in China, as well as the social development trend brought by the increasing demand for informatization, the informatization of university library archives management is inevitable and trendy. A lot have been done in the process of informatization of university archives, but because there are many differences between archives and other units in terms of institutional settings, personnel relations and work nature. Therefore, archives are subject to more constraints to adapt to the requirements of the development

of the times, resulting in the slow modernization process of university library archives management and the inability to keep up with the social and economic development.

3.3. Lack of electronic archives management technical professionals

The informatization of university libraries requires a large number of electronic archives management technical professionals due to the complexity of the project. Therefore, the staff needs to be highly professional and have strong business skills, and most importantly able to master the technical knowledge of electronic file management business. In practice, because of the lack of understanding and attention towards information technology of university archives, insufficient training is given to the personnel of archives. Hence, in order to complete the informatization of university archives, universities need to train their library staff in terms of professional quality and business ability. Besides, when universities do not pay enough attention to the training of relevant talents, the lack of professional talents will affect the students learning. Moreover, some institutions of higher education do not set up the corresponding departments or employ relevant personnel to manage the archives, resulting the underutilization of the archives.

3.4. Outdated equipment

With the continuous development of information technology, university library archives management has entered the information age, making the information construction of archives management more and more important, which requires the archives management personnel to constantly improve their comprehensive quality. However, at present, there are still many problems in the archives management of university libraries, which are mainly manifested in the immature development of e-government network and information transmission system due to the imperfect construction of the hardware facilities of the archives management unit of university libraries. At present, the hardware facilities of e-government network and information transmission system are still not up to standard, resulting in a series of problems such as slow network speed, serious security problems, and outdated communication equipment, which makes it difficult for electronic documents to be uploaded to the relevant departments for processing in a timely manner. In addition, the archival information resources can be damaged or corrupted in different degrees during the process of transmission, which is also one of the important factors affecting the informatization of archives management.

3.5. Insufficient funding for electronic archive development of universities

At present, although the informatization of university archives has been carried out, there is still a huge difference among investment on archives of different universities. Some schools have only renovated their archives room, while some schools have not established electronic archives. Insufficient investment in informatization is also a very important reason. The archives management in university library is more complex and requires many equipment and personnel. In addition, if there is no funds for the comprehensive upgrading of archives management, it is impossible to achieve the objectives of library archives informatization. We also found out that quite a few librarians in university libraries do not realize the importance of archive informatization on the development of libraries, they only pay attention to the collection of materials, but neglect the importance of financial support. In addition, some university libraries have not set up special departments for the electronic documents or lack financial support, which causes the failure in carrying out electronic document archiving.

4. Strategies for informatization construction of university library archives management

The workflow reengineering method can be applied to improve overall management and carry out real-time

monitoring of college archives entering the library, so as to kickstart college archives informatization [7-11].

4.1. Build the university archives information exchange platform

Sometimes, poor communication occurs between the archives department and the archives transfer department in which information is not exchanged in time, and there are also information barriers between different departments within the archives department. By establishing an archival information exchange platform, various archival work requirements can be released in real time to ensure that timely communication can be carried out between relevant business personnel.

4.2. Publishing archive information

The information technology file management department of the university should create a special guidance team to organize the transfer of files. This team should come out with the collection scope of files, quality requirements, and other norms on the information platform, so that the transfer party can obtain information in time to work according to the rules. At the same time, we should collect information corresponding to the archives. For example, if they learn that a major construction project will be carried out in the next year or at the end of the year, they can publish relevant information on the platform in advance and update the implementation progress in time. After seeing the relevant information, the collection personnel should have enough knowledge on that topic while inspecting the files and discover and solve any problems that occur in the process.

4.3. Archival information confirmation

The collection personnel will publish the relevant information collected in the archives on the information platform for the supervision of the third party. At the same time, the information released by the guidance team in the early stage is confirmed. Once any unsuccessful transfer is detected or there is information that does not comply with the requirements, it is necessary to mark it in time and inform the relevant personnel to address the issue in the early supervision of the informatization of university archives.

4.4. Review of archiving information

In many universities, only one person is responsible for of collecting archive information, and the professionalism and dedication of this person becomes the key to decide whether the archives can be entered into the library, causing many risks due to human factors. The comprehensive sharing of information on online accessioning allows supervisors to keep an eye on the collection dynamics, review the information released on the information platform in a timely manner, and approve the accession of archives only after the review is qualified. In the end, the archives will be like assembling cars on the production line, and each volume of archives will no longer be arbitrary, and the authentication and traceability of archives can be achieved.

4.5. Improve the awareness of the importance of information archives in colleges and universities and increase capital investment

Archival informatization should be emphasized and be included in the planning and development with urban planning and construction business, so as to strengthen the informatization of university archives. Secondly, we should vigorously publicize the archives management in colleges and universities, so that all departments fully understand the importance of archives in colleges and universities. Only by making people realize that archives are closely related to their daily work and life can we better support the informatization of university archives. In addition, in order to realize the informatization of university archives, it is necessary to ensure that the infrastructure is well-developed. In particular, it is necessary to

be equipped with an integrated software for university archives and document processing that is operable, adapts to the situation of universities, and can meet the needs of engineering projects, documenting, archiving, and digitalizing the information. Therefore, to realize the informatization of university archives, it is necessary to increase the capital investment in the college archives department [12-15].

5. Conclusion

With the continuous development of society, the role of university libraries as an important carrier of university scientific research is becoming increasingly prominent. In order to improve the level of informatization of archives management, we must give full play to the role of archival information resources and collect, process, and sort existing archival information. Aside from the need to improve the awareness of the importance of archives management, we also need to actively innovate the relevant technical means and methods. It is very necessary to develop the informatization of archives management in light of the new era, and we also need to actively introduce and adopt local and foreign advanced technology. In addition, we should strengthen the supervision and management of the information construction in the existing archives management work. Of course, in order to realize the informatization of university archives, we also need to constantly improve the rules and regulations and formulate clear technical standards.

Disclosure statement

The authors declare no conflict of interest.

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Electronic Technologies in Communications Engineering

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Abstract: The influence of modern electronic technology on communication engineering is explained in this paper. Based on the development status of communication engineering, the characteristics and application strategies of modern electronic technology in communication engineering are discussed, including the optimization and improvement of wireless communication system.

Keywords: Electronic technology; Communication engineering; System optimization

Online publication: May 31, 2023

1. Introduction

In recent years, with the progress of society, China's information construction has also made great progress. The rapid development of information technology provides a new development opportunity for Chinese communication simulation engineering. Besides, the application of electronic technology is also increasing, which improves the quality and efficiency of communication. In the application of electronic communication technology, the shortcomings of traditional communication methods are overcome. The working principle of electronic communication technology mainly includes two parts: one is transmitting data and the other is to receive and send electrical signals. When applied to electronic communication equipment, it can promote the receiving ability and transmission speed of information technology through the effective circulation and transmission of signals and improve the quality of information exchange and communication. With the advent of the big data era, information interaction between people is increasingly frequent, which puts forward higher requirements for the development of communication simulation technology [1]. To solve this problem, it is necessary to strengthen the application of electronic technology in the field of communications engineering, so as to effectively realize the security and reliability of information data transmission.

2. Overview of electronic technology

Electronic technology has been continuously developing along with computer technology and industry optimization and innovation, so as to improve the quality of people's lives. In recent years, with the continuous progress and development of economy and society, our country has entered the information age. In view of the information age, with the development of information technology, electronic technology portrays the characteristics of the current times, and it leads the trend of technological development. Compared to traditional production technology, the use of electronic technology can effectively improve the quality, efficiency, and operability of computer-related technology. In the context of big data, electronic

technology attaches more importance to the quality and efficiency of information data transmission, and is committed to providing people with more efficient, convenient and intelligent services. For example, the application of electronic technology makes daily communication more convenient. The application of electronic technology in industrial development can help industrial enterprises save a lot of raw materials, which in turn reduces costs, so as to improve the economic and social benefits of enterprises and realize energy conservation and high efficiency [2].

3. Overview of communication engineering

With the rapid development of information technology in our country, the original traditional communication engineering technology can no longer meet the needs of people's daily lives, and the demand for communications technology is also increasing. Therefore, to achieve sustainable development of communications engineering, enterprise should continue to upgrade themselves so that they can keep up with the times. In recent years, our country's communication services and optical fiber technology have been developing unprecedentedly [3]. In this context, enterprises are transformed through the development of communication engineering, communication business, and optical fiber technology, which not only help them keep up with times, but also allow effective transmission of information and realize information sharing and real-time exchange.

4. Analysis of the relationship between electronic technology and communication engineering

Electronics has been widely used in the field of communication engineering, and they drive the development and progress of communications engineering. There is a close relationship between communication engineering and electronic technology. The development of communication engineering depends on the development of electronic technology, and the development of electronic technology in turn drives the development of communications engineering [4].

For example, the popularization of mobile communication technology has greatly promoted information exchange and communication and also strengthened the application of electronic technology in communication engineering. At the same time, the network broadband equipment, communication equipment, and image processing equipment, which are often used in our daily lives are all created through the combination of electronic technology and communication engineering. Therefore, electronics and communications engineering go hand in hand.

In order to achieve sustainable development of information engineering, information technology should be fully utilized in information engineering. The development of communications engineering has driven the development of our information technology to a certain extent, and the progress and development of information technology has also promoted information exchange and communication, and accelerated the speed of information transmission and sharing.

4.1. Analysis on the advantages of electronics' development in the environment of big data

People's demands are increasing along with the emergence of big data, which provides endless power and support for the development of electronic communication technology. Therefore, electronic communication technology has become an important part of science and technology. It also effectively promotes the progress and development of our tertiary industry. Electronic communication is the core of the development of information technology, and it has contributed greatly to our economic growth [5]. Electronic information technology is important in many enterprises and industries. Therefore, it can not only promote our economic and social development, but also meet the daily needs of the people, so as to improve the quality of production and quality of life. Therefore, in the big data environment, the integration of electronic information technology and communication engineering allows communication engineering to develop to

the greatest extent, which will in turn promote the long-term development of the country's information industry. Electronic devices are becoming increasingly important in human life. Therefore, it is very important to innovate and optimize electronic technology to maximize the advantages and value of electronic devices.

4.2. Electronic technology is compatible with big data technology

In recent years, big data technology has been used to exchange information and communicate. Big data technology has good compatibility, and electronic technology is also compatible with big data technology. Not only can the compatibility of electronic technology be improved through the development of big data, but it also can achieve internal integration with other equipment and software. The development of electronic technology has resulted in much innovation. Besides, it also satisfied the diversified demands of information of people. Many devices and software can be created through electronic technology, resulting in the improvement of electronic communication and increase in the speed of information transmission [6].

4.3. Benefits of electronics technology in the big data environment

With the continuous progress of our country's economy and society, the development of electronic technology made life much more convenient. Especially in the big data environment, people's for information technology in communication is increasing. Therefore, electronics and big data should be combined to meet the demands of people. Besides, relevant units and enterprises should also combine electronic technology with big data technology in their daily operation. In this way, the diversity of electronic technology can be truly reflected.

4.4. Anti-interference ability of electronics in big data environment

Because the development of electronics was not ideal, it is difficult to improve the quality of electronics. With the help of big data, electronic technology is being improved and upgraded. In terms of information transmission, electronic technology is highly secure, fast, and convenient. If there are interferences during information transmission, the information transmitted by users will be hampered, and the security of the data might even be affected. The integration of big data technology and electronics can overcome the defects of electronics in the transmission of information and enhance the anti-interference ability of electronics. The specific application of information technology in big data environment was analyzed. Electronics includes two parts, one is power electronics, the other is information technology. Both power electronics and information technology can be applied to communication engineering to realize their respective values. In communications, electronics is more about information. In the big data environment, information and telecommunication technology achieves effective transmission and sharing by its effective regulation and transformation of communication data. As far as communications engineering is concerned, it is necessary to achieve reasonable allocation and utilization of resources and improve the transmission effect of information and data. Usually, in communication projects, nodes in the network are effectively used for transmission, so as to achieve effective allocation of network resources. However, because we are in an era of information explosion, if a communication project is faced with relatively large data resources, the efficiency of resource allocation will decline, and it is costly to improve the communication system. In order to prevent that from happening, electronic technology should be integrated into communications engineering to fully display the value and advantages of electronic technology, so that information can be disseminated and distributed quickly when faced with huge information data resources, thus reducing the cost and improving the efficiency of information distribution. In addition, in the face of massive information and data, system failure of communication engineering may occur, causing loss of information. Therefore, it is necessary to improve and optimize electronic technology, integrate electronic technology into

communication engineering, and develop an electronic control system. An electronic control system can not only prevent system paralysis, but also effectively complete the information saving, thus preventing loss of information. Generally speaking, communication engineering prefers information electronic technology in electronic technology, but in the development of communication engineering IC, but pay more attention to the power electronic technology in electronic technology, so as to ensure the normal operation of communication engineering.

In the big data environment, electronics and communication technology will develop simultaneously. Communication technology and electronics are mutually reinforcing and complementary. Electronic technology should be further developed in the big data environment, which promotes the application of electronic technology in the field of communications engineering, improve the rate and quality of information transmission, to achieve the purpose of optimal configuration, improve the stability, security, and reliability of integrated circuits. Communication technology must also adapt to the basic requirements of social development in the new period. Besides, the service function should also be optimized, and the quality and the quality of electronic technology application should be improved, so as to promote the continuous progress and development of electronic technology in our country. Communications engineering and electronic technology play important roles in mobile communication, communication network, graphic communication and network broadband, and they are closely related to our daily lives. At the same time, the synergistic development of electronics and communications engineering will also help improve human understanding of artificial intelligence [7].

5. Conclusion

In summary, under the background of big data, the integration of electronic technology into communication engineering can not only fully reflect the value of electronic technology, but also improve the service quality of communication engineering. In order to promote the long-term and healthy development of Chinese economy and society, we must effectively integrate electronic technology and communication engineering, and continuously analyze the relationship between them, so as to optimize the performance of the system, so as to meet the actual development demand of Chinese economy and society.

Disclosure statement

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Psychological Emotion Analysis System for Special Needs Children Based on Neural Network

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Abstract: With the development of modern society and the improvement of living standards, care for special needs children has been increasingly highlighted, and numerous corresponding measures such as welfare homes, special education schools, and youth care centers have emerged. Due to the lack of systematic emotional companionship, the mental health of special needs children are bound to be affected. Nowadays, emotional education, analysis, and evaluation are mostly done by psychologists and emotional analysts, and these measures are unpopular. Therefore, many researchers at home and abroad have focused on the solution of psychological issues and the psychological assessment and emotional analysis of such children in their daily lives. In this paper, a special children's psychological emotional analysis based on neural network is proposed, where the system sends the voice information to a cloud platform through intelligent wearable devices. To ensure that the data collected are valid, a series of pretreatments such as Chinese word segmentation, de-emphasis, and so on are put into the neural network model. The model is based on the further research of transfer learning and Bi-GRU model, which can meet the needs of Chinese text sentiment analysis. The completion rate of the final model test has reached 97%, which means that it is ready for use. Finally, a web page is designed, which can evaluate and detect abnormal psychological state, and at the same time, a personal emotion database can also be established.

Keywords: Deep learning; Special needs children; Psychological emotion; Analysis system

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1. Introduction

1.1. Social background

With the development of modern society and the continuous improvement of living standards, care for special needs children has been increasingly highlighted, and numerous corresponding measures such as welfare homes, special education schools, and youth care centers have emerged. Society's concern for children and adolescents is also increasing. A person's outlook on life and values are usually formed during their childhood all the way to adolescence, and the mental health of this stage is particularly important [1]. The phenomenon of left-behind children exists in some areas, where children are not accompanied by their parents in their daily lives, often resulting in a sense of loneliness and eventually mental health issues. Mental health issues do not only appear in neglected children, but also in special needs children, in which psychological defects are inevitable. Therefore, it is of great significance to evaluate their mental health.

Nowadays, emotional education, analysis, and evaluation are mostly done by psychologists and emotional analysts, and these measures are unpopular. Usually, only those with mental illness and psychological issues will seek help from psychologists. Therefore, in this paper, we designed a smart wearable device, which collects the wearer's daily speech through speech recognition and storage device,

converts it into Chinese text, and then performs sentiment analysis to evaluate the psychological state of the wearer.

There are many methods of sentiment analysis. Traditional machine learning methods requires the input of marked target domain data into the network, and the data are classified in other target domains through the classifier obtained by learning. With the large increase of data, labeling the data in the target domain becomes costly, and the efficiency decreases [2]. Even if there is semi-supervised learning, the classification learning of emotional data still cannot be performed well. Transfer learning is a new learning framework that can learn knowledge from the source domain with a large amount of labeled data and transfer it to the target domain with a small amount of labeled data, and transfer learning can realize the learning of the new domain. In addition, transfer learning can achieve cross-domain and cross-language sentiment classification. Therefore, this paper uses the relationship-based emotion knowledge learning and transfer model to evaluate the emotion and emotional tendencies of the wearer based on their words: positive or negative [3]. Reasonable advice can then be given based on the mental health evaluation by this model.

1.2. Research status at home and abroad

Research on sentiment analysis began many years ago. In 2002, Turney *et al.* first proposed the task of sentiment classification, which mainly analyzes the emotional tendencies of data: neutral, positive, and negative [4].

The main research methods of affective learning are either dictionary-based or machine learning-based. The dictionary-based only requires the construction of a thesaurus with a large number of labeled data, which contains a large number of symbolic words that can represent the emotional tendency of the text. The data in the thesaurus can then be used to predict the emotional tendency of the input sample data. When a sentence is input into the emotion dictionary as a sample, it will be split into symbolic words one by one, and then matched in the lexicon with positive, negative, and neutral words, and finally the overall emotion coefficient is calculated, so that the emotion tendency of the whole sentence can be predicted. However, the dictionary-based sentiment analysis method only relies on the dictionary database, but in reality, the application scenarios of text data are diverse and flexible, so this method is not practical. Therefore, Pang *et al.* proposed the use of machine learning methods for sentiment classification, among which the deep learning method is the most popular among researchers.

When deep learning is applied to sentiment analysis, in order to improve the accuracy of sentiment data classification, it is generally required that the training data of the input network and the test data of the test model conform to independent co-distribution. In order to adapt to the test data samples in many cases, the training data should be sufficient with a wide range, so that a model with good emotion classification function can be trained. Neurons in neural networks can learn from input samples and capture the characteristics of input samples well. The core of deep learning is feature learning. Feature learning automatically extracts the basic features that can represent the sample [5], transfers these features layer by layer, and then updates the model parameters through backpropagation algorithm, and finally obtains effective fitting result. Both convolutional neural network (CNN) and recurrent neural network (RNN) can be used for emotion classification of text. Kim *et al.* proved that CNN is better than RNN in classification performance alone. However, CNN and RNN both have some disadvantages. When the depth of the neural network increases, the classification effect is often better. However, as the depth of the network increases, problems such as gradient explosion and exploding gradients are prone to occur. Besides, it cannot process text-related data effectively. Therefore, Zhu *et al.* used long-short-term memory network (LSTM) to classify long text emotions, and its performance was better than CNN.

However, in the case of large amount of training data, the cost of neural network is also high. Transfer learning has better performance where it can learn knowledge from a large number of labeled data and transfer it to a small number of labeled data domain. In this research, transfer learning was applied in sentiment classification. In addition, relation-based emotional knowledge learning was also used to learn the source domain data and the target domain data, which improves the classification ability of the network.

2. Scenario analysis

2.1. Scheme I

RNN will process the data based on the input order of the text. The RNN also has a three-layer network structure: an input layer, a hidden layer, and an output layer. The previous output data will be used as input data of the RNN input layer. The reason why RNN can combine the context of the text to train the network is that it has a cycle kernel. The cycle kernel in the network can realize parameter sharing at different times and the sequential time extraction of the input speech text. In the process of forward propagation, the information at time t is stored in the memory, and the data in the parameter matrix is unchanged. In the process of backward propagation, the data in the parameter matrix will be updated according to the gradient descent method.

2.1.1. Analysis

Although RNN network is useful for emotional analysis of this kind of language text, but it also has a major disadvantage. For the emotional analysis of long texts, each keyword is significant, and when we read it as human beings, we will take it into account. However, for RNN network, if two keywords are passed, then the first keyword will have no effect on the update of the network parameters, which means that RNN may have the problem of gradient disappearance.

2.2. Scheme II

To overcome the shortcomings of RNN, a long short-term memory network (LSTM) can be used. There are many gate control units in LSTM. These gate control units transmit information over a long distance, that is, the previous data can be effectively applied to the subsequent network parameter updates. Compared to RNN, the basic unit in the hidden layer of LSTM is different, in which LSTM uses the LSTM unit. The LSTM unit can solve the problem of gradient disappearance in RNN.

2.2.1. Analysis

The Bi-GRU model used in this paper uses the transfer learning method to get the cross-domain invariant emotional knowledge from the source domain. The relationship between the target domain and the source domain will then be analyzed to learn the private emotional knowledge of non-shared knowledge. The combination of the cross-domain invariant sentiment knowledge and private sentiment knowledge in classifying the target domain will improve the accuracy of the target domain sentiment classification, and this model is simpler and more efficient compared to LSTM.

3. Model structure

The structure of the overall model is shown in **Figure 1**.

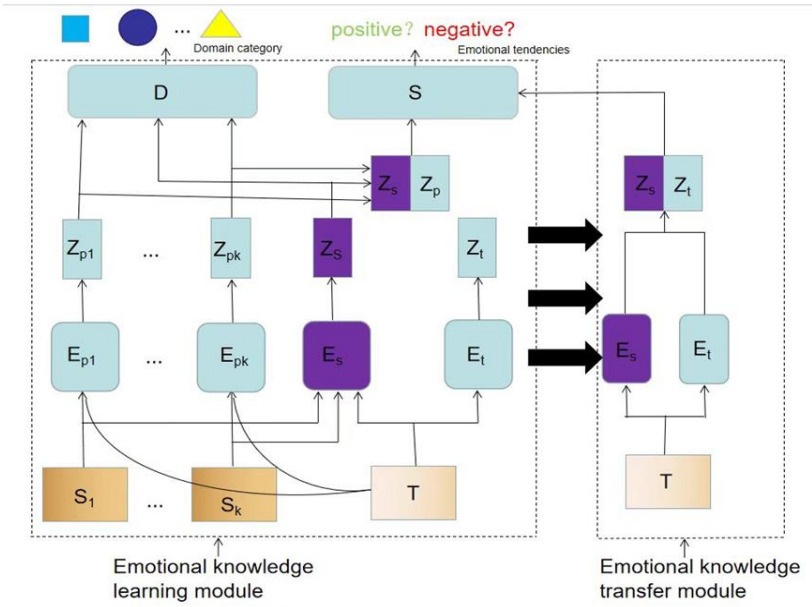

Figure 1. Model structure

This model is divided into two parts, one is emotional knowledge learning, the other is emotional knowledge transfer.

The model is set up with S_1,S_1..S_n, with a total of *n* source domain and 1 target domain, *T*. The input of the model is the preprocessed data of these *n* data with a large number of labels. In **Figure 1**, E_{pn} shows the private feature extractor unique to the *n*th source domain, and the private features extracted by the extractor are stored in Z_{pn}. E_t is the feature extractor of the target domain, while Z_t is the result extracted by the feature extractor. There is also a shared feature extractor in the model, where E_s is the result is saved in Z_s, which is a cross-domain shared feature of *n* source and target domains. The D network is the discriminator network referenced from the GAN network, and it can be seen in **Figure 1** that the input of the D network is the sum of the private feature and the shared feature. C is the classification network, which is used to classify the emotional tendency of keywords.

3.1. Knowledge learning module

This model mainly trains the E_s and E_t.E_s. The training is the same as the antagonistic learning idea of GAN network. After E_{pn} and E_s were input into the D network, the D network was trained. The output of the discriminator could determine which domain the feature belongs to. The discriminator was then subjected to antagonistic training until the discriminator cannot determine which domain the feature E_s in the input network belongs to. Through such a process of confrontation, the network could not distinguish which field the E_s it belongs to, because the E_s had the common characteristics of all fields. In this way, cross-domain invariance with features can be achieved.

E_s draws on the antagonistic ideas of GAN networks, while E_t draws on the ideas of knowledge distillation. As mentioned earlier, the relation vector between the target domain and the source domain is needed, so the relation vector was obtained by the D network. The specific process was as follows: data of the target domain was input into *n* private feature extractors of the source domain, then the obtained *n* private features was input into the D network, and the output of the D network was normalized to obtain a relation vector, W. The learning target of the private feature extractor was obtained by weighting and averaging the *n* private features with W, and then the parameters of the network were updated according to

the loss E_t.

If each target domain data is regarded as a sample of *n* source domains, the classifier will output different results. Therefore, when the data in the target domain is input to *n + 1* (1 represents the E_t private feature extractor) private feature extractors, *n + 1* features will be obtained, and then they will be sent to the classification network, and there will be *n + 1* classification results. In this paper, the relation vector *W* was used to weight each private feature, and the classification result of the target domain was obtained according to the weighted data, and then the classification result was used as the pseudo-label of the target domain, the pseudo-label was considered applicable when the confidence level of the pseudo-label is in a certain range. The pseudo-label and the data in the target domain were included in the training set$T^{\sim}$.

3.2. Migration module

The other part of the model is the transfer module (emotional knowledge transfer module), which can be used to train a network model that can classify the samples in the target domain accurately. The input of this part was the pseudo-label training set$T^{\sim}$mentioned above, and the $E_t + E_s$ was the network trained by the previous emotional knowledge learning module. After the training set$T^{\sim}$was sent to the two trained networks, two features were obtained, which were sent to the classifier C, and the parameters of the classifier C and the feature extraction network E_t were updated according to the classification loss. During the whole training process of the model until the end, the loss of the model gradually converged, and the classification ability in the target domain was also enhanced.

3.3. Loss function

The model comprises a plurality of training networks, including a feature extractor network, a discriminator network, and a sentiment classification network, wherein the feature extractor network comprises *n + 1* private feature extractor networks and a shared feature extractor network. Bi-GRU model was used for all feature extractor networks, MLP was used for D network, and C network was a fully connected layer network. Adam algorithm was used to optimize the parameters of the network.

The loss of the discriminator network was calculated as follows:

$$\mathrm{Loss}_D = \sum_{i=1}^{k+1} \sum_{j=1}^{N_i} \mathcal{L}_D\left(D\left[E_S\left(x_i^j\right)\right], d_i\right) + \sum_{i=1}^{k} \sum_{j=1}^{N_i} \mathcal{L}_D\left(D\left[E_{pi}\left(x_i^j\right)\right], d_i\right)$$

where I represents the *i*-th source domain, and J represents the *j*-th sample; x_i^j represents the *j*-th sample data in the *i*-th domain.

The loss of the sentiment classification network C was calculated as follows:

$$\mathrm{Loss}_C = \sum_{i=1}^{k} \sum_{j=1}^{N_i} \mathcal{L}_C\left(C\left(E_s\left(x_i^j\right) \oplus E_{pi}\left(x_i^j\right)\right), y_i^j\right)$$

where y_i^j represents the label corresponding to the *j*-th sample data in the *i*-th field.

E_s antagonism was used in the training of the network, so the loss of antagonism loss was calculated as follows:

$$\mathrm{Loss}_{adv} = -\lambda_{adv} \sum_{i=1}^{k+1} \sum_{j=1}^{N_i} \mathcal{L}_D\left(D\left[E_s\left(x_i^j\right)\right], d_i\right)$$

The loss of the network E_t was calculated as follows:

$$\text{Loss}_p = \mathcal{L}_p\left(z_t, \sum_{j=0}^{n} w_j \cdot z_{pj}\right)$$

where$z_t$is the characteristic of the sample in the target domain obtained by the E_t network; $w_j$represents the relationship vector between the target domain and the jth source domain; z_{pj} represents the characteristic of the sample data in the target domain after the jth private feature extractor; and $\mathcal{L}_p$ is the cross entropy loss.

The cross-entropy loss function used in this paper is as follows:

$$\text{Loss}_{SC} = -\sum y_i \log\ h(z_i) + (1 - y_i)\log\left(1 - h(z_i)\right)$$

where z_i represents the feature of the ith sample,$h(z_i)$represents the sentiment label, and y_i represents the true label data of the sample.

3.4. Diagram of training results

The data training accuracy and cross entropy loss of the psychological and emotional analysis system for special needs children based on neural network are shown in **Figures 2** and **3**.

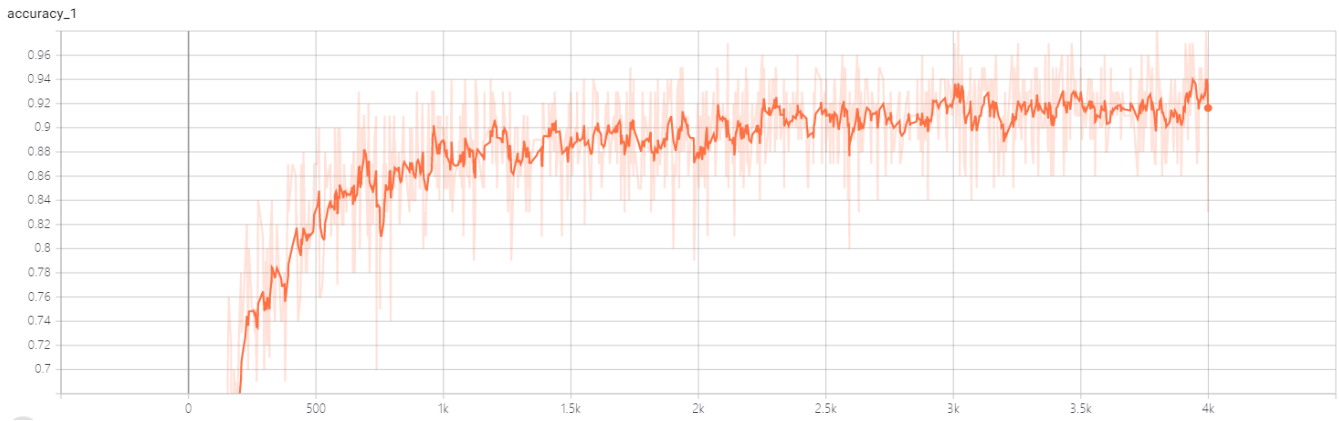

Figure 2. Training accuracy chart

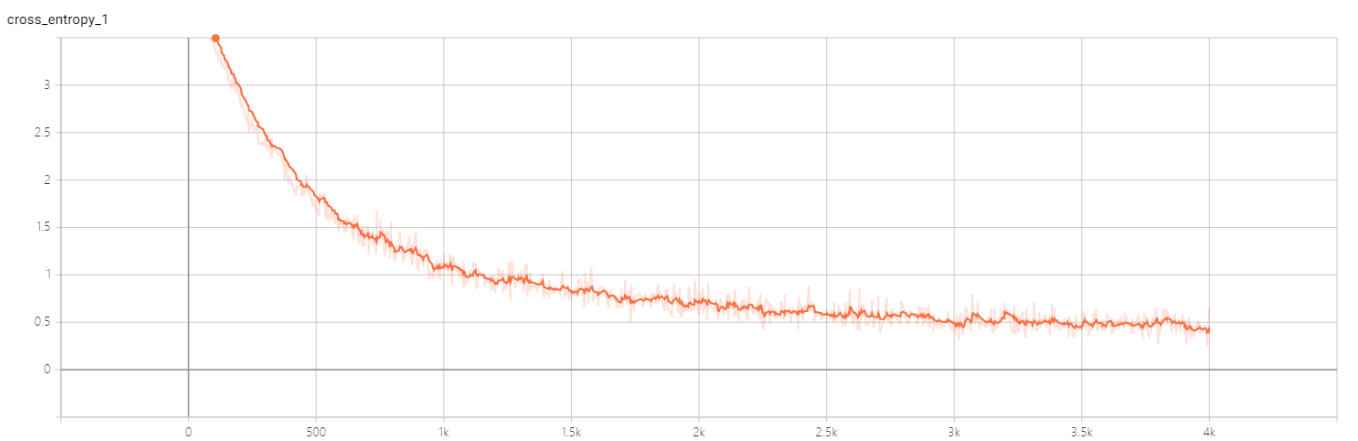

Figure 3. Cross entropy loss diagram

4. Test and analysis

4.1. Functional test

Table 1. Functional test

Category	Comments	Emotional tendencies
Children's toys	So cool, I love it!	Positive
	The quality of the toy car is very good.	Positive
	Cool and cute.	Positive
	The workmanship and quality are good	Positive
	Kids don't like it.	Negative
	It's a little expensive.	Negative
	The material is not good.	Negative
	It's similar to the toys at the dollar store.	Negative
	Too bad	Negative
	Simple and fun to use, very suitable for children.	Positive
	It's good. Kids like it.	Positive
	Good value for money and had a great time.	Positive
	Received, my kids like it very much, and the quality of the items are good.	Positive

4.2. Webpage display

The web page designed by HTML can display the psychological emotional scores based on emotional analysis and realize the visualization of data. (**Figure 4**)

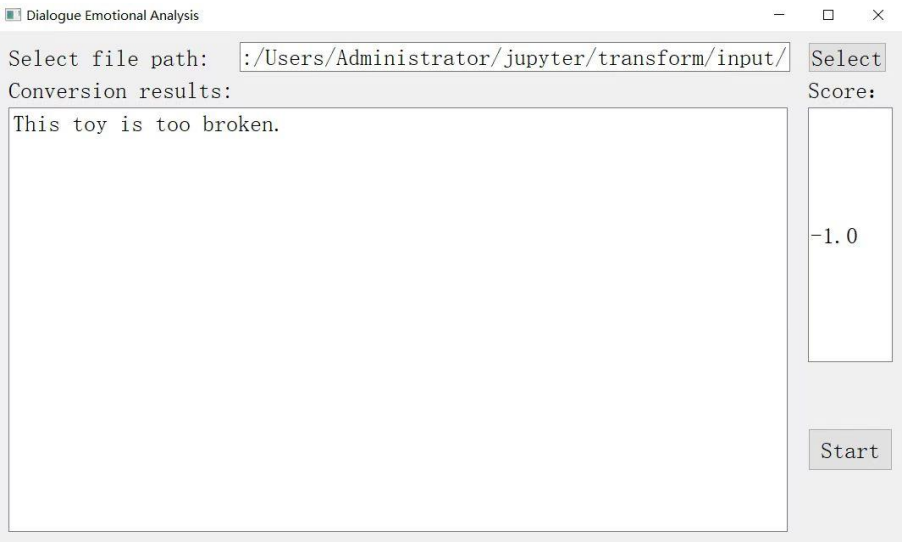

Figure 4. Display of psychological and emotional scores

5. Summary and prospect

The living standards of people are developing along with the development of modern society, and children's mental health are increasingly highlighted. An emotional knowledge learning and transfer model is used in this research to classify the emotional state through text. In this model, words from daily conversations can be collected and converted into texts, and the text are input into the model to classify the emotions. The accuracy of emotion classification is very high, and the results can be used for psychological assessment to monitor the mental health of children.

Due to the limited collection of sample data, daily conversations cannot be covered completely in this study, and more sample data should be collected in the future. We can also consider introducing the RERT model in future works.

Disclosure statement

The authors declare no conflict of interest.

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Integrating Multiple Linear Regression and Infectious Disease Models for Predicting Information Dissemination in Social Networks

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Abstract: Social network is the mainstream medium of current information dissemination, and it is particularly important to accurately predict its propagation law. In this paper, we introduce a social network propagation model integrating multiple linear regression and infectious disease model. Firstly, we proposed the features that affect social network communication from three dimensions. Then, we predicted the node influence via multiple linear regression. Lastly, we used the node influence as the state transition of the infectious disease model to predict the trend of information dissemination in social networks. The experimental results on a real social network dataset showed that the prediction results of the model are consistent with the actual information dissemination trends.

Keywords: Social networks; Epidemic model; Linear regression model

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1. Introduction

With the development of internet technology, social network has become the mainstream medium of information dissemination. In view of the huge impact of information dissemination in social networks on people's life and social development, the analysis of information dissemination in social networks has garnered widespread attention from many researchers. They have attempted to mine, quantify, and predict the spread of information in social networks. These works add to our understanding of the topology, characteristics, and rules of communication of social network from the perspective of information dissemination. It has wide application prospects in various fields, including enterprise marketing, public opinion control, and social business recommendation. Therefore, it is of great research and application value to quantify the node influence, determine the cause of information dissemination in social networks, and to explore the regularities of information dissemination in social networks.

Information dissemination in social networks mainly involves node influence, the maximization of influence, the interpretation and prediction of the propagation law, *etc*. Among them, the interpretation and

prediction of the propagation law involve the independent cascade model, the linear threshold model, the classification model, the game theory model, and the epidemic model. Since the process of information dissemination in social networks is similar to the spread of disease, most of the information dissemination models are derived from the classical susceptible-infected (SI), susceptible-infected-susceptible (SIS), susceptible-infected-recovered (SIR), susceptible-decreasingly infectious-recovered (SDIR), and susceptible-exposed infectious-recovered-susceptible (SEIRS) epidemic models. Tsur *et al.* [1] used linear regression to predict the influence range of tags on Twitter in a certain period of time in combination with content feature, topology, and time factor. Xiao *et al.* [2] analyzed the causes of influence from two aspects, personal memory and user interaction, and proposed a method to measure the social influence of users based on the multiple linear regression model. Li *et al.* [3] proposed an information communication model based on heterogeneous mean field and evolutionary game, taking into account the real topological relationship between the participants and the psychological characteristics of users. The above research proves that it is reasonable to measure node influence from three dimensions: topology structure, user interaction behavior, and information content; however, the studies have failed to construct a node influence measurement model embodying the aforementioned three dimensions.

Given the few studies on state transition probability in the information communication model and the incomplete consideration of the influencing factors in the measurement of node influence, we present a method for measuring the influence of multi-dimensional nodes based on the multiple linear regression model. Taking node influence as the cause of state transition in the epidemic model, we analyzed the factors affecting information dissemination and described the trend of information dissemination in social networks. Lastly, we verified the feasibility of this method by experiments on a real data set. The main contributions of this paper can be summarized as follows:

(i) analysis of the influencing factors of information dissemination in social networks; construction of a measurement model that integrates three dimensions (topology, user interaction behavior, and information content) based on multiple linear regression;
(ii) proposal of a new SIR information dissemination model based on node influence to model the information dissemination process and predict its future propagation trend;
(iii) our method is more in line with the actual situation of information dissemination than existing baseline methods.

2. Problem description

2.1. Description of social network

Social networks are often represented by graph $G=\{V,E\}$; $V=\{\mathrm{v}_1,\mathrm{v}_2,\cdots,\mathrm{v}_n\}$ is the node set, that is, the users set, where $\mathrm{v}_i(1\le i\le n)$ is a user (node), and $|\mathrm{V}|=\mathrm{n}$ represents the size of the node set, that is, the total number of users; $E\subseteq V\times V$ is the edge set, that is, the following relationship between users, where e_{ij} represents an edge, that is, user v_i follows v_j.

2.2. Description of information communication

Given a social network, $G=\{V,E\}$, information travels along its edges – the process of information communication in the epidemic model (SIR). At different times, users in the social network are in one of the three states in the epidemic model, namely the unknown (S), who may participate in information dissemination; the already known (I), who conducts information dissemination behavior; and the immune (R), who loses interest in information and no longer produces communication. Among them, the transition between states is determined by the node influence.

3. Model framework

As shown in **Figure 1**, we proposed an information dissemination model of multi-dimensional node influence by combining social user relationships and historical data. The features that influence information dissemination in social networks were extracted multi-dimensionally, and the node influence features were constructed based on the multi-dimension linear regression model. The quantization value of node influence features was taken as the state transition probability of the epidemic disease model to establish the dynamic differential equation and describe the trend of information dissemination as well as the change of group status in social networks at different times.

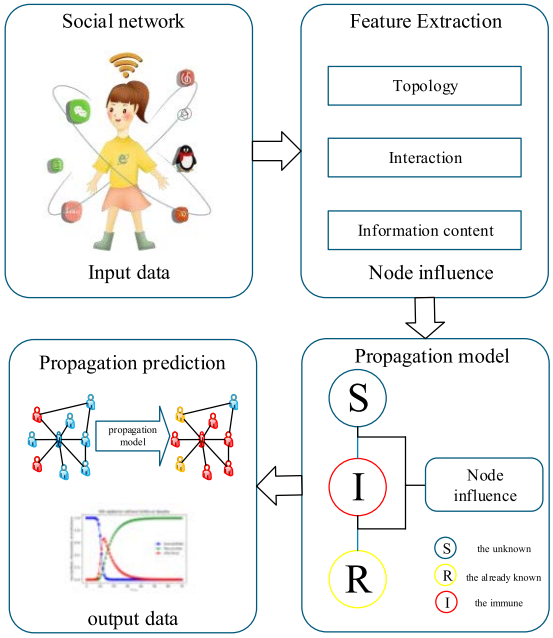

Figure 1. Information dissemination model framework

3.1. Feature extraction

Information dissemination in social networks is a complex and dynamic process, which is affected by multi-dimensional factors, including topology structure, user interaction behavior, information content, *etc*. We proposed the quantification features of node influence from the aforementioned three dimensions, as shown in **Figure 2**.

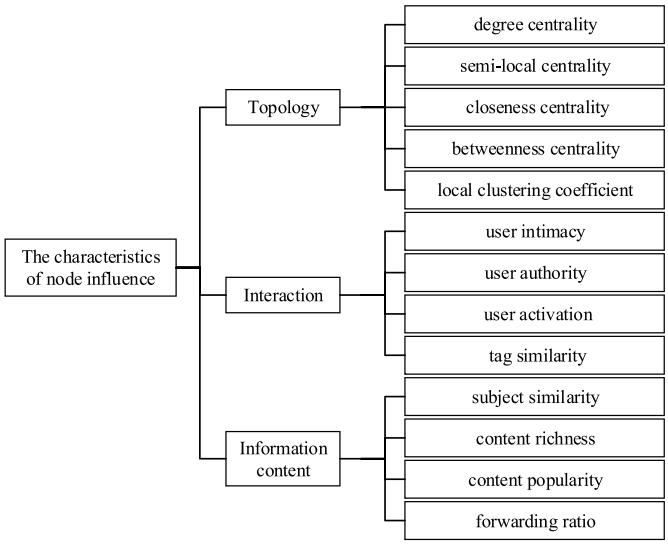

Figure 2. Node influence feature framework

3.2. Feature processing

We normalized the feature extracted in section 3.1. The data were normalized to [0,1]. The normalized feature data were represented as the feature vectors of topology structure (T), user interaction behavior (B), and information content (M), whose symbolic meanings are shown in **Table 1**, and the vector forms are shown in equation (1). The dimensions of a vector were defined by d_T=5, d_B=4, and d_M=4, *i.e.*, the number of features of topology, interaction, and information content.

Table 1. Node influence features

Dimension	Feature	Symbol
Topology (T)	degree centrality	t1
	semi-local centrality	t2
	closeness centrality	t3
	betweenness centrality	t4
	local clustering coefficient	t5
Interaction behavior (B)	user intimacy	b1
	user authority	b2
	user activation	b3
	tag similarity	b4
Information content (M)	subject similarity	m1
	content richness	m2
	content popularity	m3
	forwarding ratio	m4

$$\begin{aligned} T&=\left(\mathrm{t}_1,\mathrm{t}_2,\mathrm{t}_3,\mathrm{t}_4,\mathrm{t}_5\right)^{\mathrm{T}} \\ B&=\left(b_1,b_2,b_3,b_4,b_5\right)^{\mathrm{T}} \\ M&=\left(m_1,m_2,m_3,m_4\right)^{\mathrm{T}} \end{aligned} \tag{1}$$

3.3. Feature fusion

According to section 3.1., the node influence that affects information communication is not only related to the features of the topology in social networks, but also to the features of user interaction and information content. Multiple linear regression was used to find a linear equation from the historical data in the social network to describe the relationship between the multi-features (independent variables) of topology structure, user interaction behavior, and information content and the node influence (dependent variables). The linear equation was used to predict the new unknown node influence. The mathematical form of the model is shown in equation (2).

$$\mathrm{f}_{\mathrm{ri}}(v_i)=\omega_1 T+\omega_2 B+\omega_3 M+b \tag{2}$$

where $\omega_i=\left\{\omega_1,\omega_2,\omega_3\right\}$ is the weight of the node influence feature dimension. The greater the weight, the greater the influence of the feature dimension on the node influence. B is the bias and scalar.

3.4. SIR information dissemination model

In order to demonstrate the influence of node influence on information dissemination in social networks, the classical SIR epidemic model was used to simulate the information dissemination process [4,5].

Considering the complexity and uncertainty of information dissemination, the following assumptions were made when constructing the SIR information dissemination model:

(i) information dissemination in social networks is time-sensitive; it is assumed that the number of users in social networks is N, which remains unchanged in a period of time, that is, S + R + I = 1;

(ii) users in the social network will definitely forward when they reach the threshold of node influence after they come into contact with the information;

(iii) after the forwarding behavior generated by the user, if there is no longer forwarding after a period of time, the user will become an immune user.

Node influence probability $p(v_i)$ is expressed by sigmoid function:

$$p(v_i)=\frac{1}{1+\exp\{-\mathrm{f_{ri}}(v_i)\}} \tag{3}$$

where, $\mathrm{f_{ri}}(v_i)$ is the value from the output of the node influence model in section 3.3.

When node v_i has n neighbor nodes, the probability of the number of nodes with state changes conforms to the binomial distribution.

$$P_{(x=k)} = C_n^k p(v_i)^k (1-p(v_i))^{n-k} \tag{4}$$

where k = (0, 1, 2,…, n).

Therefore, the probability of any node with state change in the social network is as follows:

$$\lambda(t) = \sum_{\mathrm{k=0}}^{\mathrm{n}} \frac{\mathrm{k}C_n^k p(v_i)^k (1-p(v_i))^{n-k}}{\mathrm{n}} \tag{5}$$

where k = (0, 1, 2,…, n).

According to equation (3), the probability that the state of any node in the social network does not change is as follows:

$$\mu(t) = 1\text{-}\lambda(t) \tag{6}$$

According to the dynamics equation of the epidemic model, when the node in the social network is in the state of information unknown, it is converted into the state of information known with a probability of $\lambda(t)$ and the state of information immunity with a probability of $\mu(t)$. Therefore, the dynamic equation of information dissemination based on node influence is as follows:

$$\begin{cases} \dfrac{dS}{dt} = -\lambda(t)S(t)I(t) \\ \dfrac{dI}{dt} = \lambda(t)S(t)I(t) - \mu(t)I(t) \\ \dfrac{dR}{dt} = \mu(t)I(t) \\ S+R+I=1 \end{cases} \tag{7}$$

4. Experiment

In order to verify the model proposed in this paper, we evaluated the effect of the proposed model from two aspects on a real data set from Sina Weibo [6]: (i) analysis of information dissemination process (research on the changes of SIR nodes in the model proposed in this paper); (ii) information dissemination fitting experiment to verify the fitting degree of the model proposed in this paper with the real communication process. The total number of nodes in the dataset is 10,000, and the number of edges is 62,475.

4.1. Analysis of information dissemination process

One node in the social network was set as the node with known information, while the other nodes were nodes with unknown information. The model parameters were as follow: $\lambda(t) = 0.65$; $\mu(t) = 0.35$. The changes in trend of the number of known nodes, unknown nodes, and immune nodes in the social network with time were analyzed. The experimental results are shown in **Figure 3**.

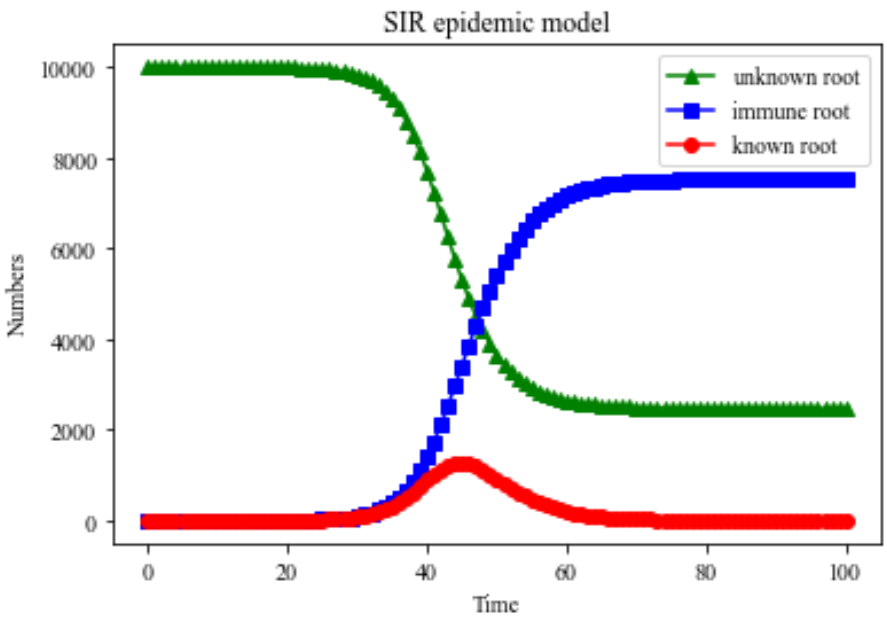

Figure 3. Multi-dimension node influence information dissemination model

It can be seen from **Figure 3** that the number of nodes with known information is 1 and the number of nodes immune to information is 0 at the initial time. With the information known nodes spreading information, the number of unknown nodes decreased sharply at about 30, and the information began to accelerate the propagation. With the passage of time and the deepening of information dissemination, information immune nodes began to appear around 40, and the number of information immune nodes increased rapidly with time. When the number of nodes with known information reached the peak at about 45, the number of immune nodes increased rapidly, while the number of unknown nodes decreased rapidly. At the time point of 100, the information immune node is 10,000, while the information unknown node and information known node are both 0, indicating that the information propagation process is over.

4.2. Information dissemination fitting experiment

In order to verify the performance of this model, the topic "good method of planning app promotion scheme" in Sina Weibo was chosen. The experimental model parameters were as follows: $\lambda(t) = 0.75$; $\mu(t) = 0.25$; and the time was 12 hours. The experimental results are shown in **Table 2**.

Table 2. Comparison of the number of known nodes between the model and real information propagation

Time point	1	2	3	4	5	6	7	8	9	10	11	12
Model in this paper	1	200	500	1,500	4,215	7,825	1,144	3,248	10,012	25,025	54,686	100,999
Actual propagation	1	100	375	10,258	37,465	5,412	1,002	2,749	8,899	24,986	50,326	102,689

It can be seen from **Table 2** that there is a small gap between the number of information known nodes predicted by the model and those of real information dissemination at different time points. The results showed that our model has a good fit with the information dissemination trend in the real social network.

5. Conclusion

In this paper, we introduce a model of information dissemination in social networks based on multi-dimensional node influence. We analyzed the factors that affect node influence and proposed the features of node influence based on topology, user interaction behavior, and information content. In addition, we proposed a node influence measurement model based on multiple linear regression and an information communication model based on SIR to provide reference and new methods for relevant research on extraction of influencing factors, construction of influencing features, and construction of information communication models during the process of information dissemination in social networks. The effectiveness of the proposed method was verified on a real Sina Weibo dataset. In our future work, we will propose more feature dimension and further explore the law of information dissemination in social networks.

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Disclosure statement

The authors declare no conflict of interest.

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Prevention and Countermeasures of Driving Hazards

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Abstract: As a modern means of transportation, cars have made travelling much easier. However, cars also lead to many traffic accidents, which are often dangerous. Through an investigation and analysis of traffic accidents, it was found that the hidden dangers of driving are one of the main causes of car accidents. In order to better ensure the safety of driving, the hidden dangers of driving should be better prevented, traffic safety measures should be improved, and better protection should be provided for people's lives and property. Therefore, we analyzed the hazards of driving and proposed prevention measures, in hopes of improving driving safety.

Keywords: Driving hazards; Prevention; Countermeasures

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1. Introduction

The first ever driver's permit was issued in 1888, and it was given to the man who was credited to have invented the first ever "practical car" and revolutionized the technologies of transportation. He is the German inventor Carl Benz, who later founded the Mercedes-Benz company. The permit itself was a lousy piece of paper with handwriting that was fairly hard to understand, issued by the local German authority called Grand Ducal. The initial intent of the document was to regulate the noise and smells from cars on the street after such complaints by residents. However, it was not until 1904 that cars became increasingly popular and the technology surrounding it started to turn cars into a common tool, and the United Kingdom became the first nation to enforce mandatory driving license. As traffic-related accidents started to surface upon the newfound fascination of driving, the idea of driving safety and education came into the equation.

2. Driving hazards

2.1. Safety hazards on the driver's side

Why is it that there are so many teenagers who yearn and dream about the day when they can finally drive? As of today, driving has become such a fundamental and essential part of our lives, it would be impossible for kids to not imagine themselves one day yielding these four-wheeled metal cartridges, carrying an excited and aspiring young soul. In my perspective, together with the ones of those around me, the ability to drive is even more so a sign of freedom and control over our lives. In a high school environment where most people here are between the ages of 14 to 18, this is a topic that is frequently highlighted. Everyone wants to get their driver's permit sooner that it became a culture where the earlier a person gets their permit, the more respectable they are to others. But since there is a minimum age requirement enforced by the law, how young is too young? Here in California, the minimum age to start driving is 15 and a half years old,

whereas in Brazil the minimum age is 18. However, in certain states in the US such as Kansas and Iowa, the minimum age is at a whopping low number of 14. It seems as though some governments trust their teenagers more than others. People are aware that adolescence in development does require more care and control for an activity that can lead to dangers and fatalities. The DMV has reported that the rate of teenage traffic accidents per mile is 4 times greater than that of adults. Therefore, despite how hard it is to sit through the long wait, it is understandable that the law demanded it to be this way.

The young age of car drivers, driving skills as well as driving experience are very closely linked to driving safety, all of which can lay down hidden dangers for driving safety. In addition, the driver needs to have a good sense of safety; otherwise, it may lead to serious traffic offences or unsafe behaviors, which increases the probability of safety accidents tremendously. The driver, as the main person who is in charge of the car, should be capable of driving safely.

2.2. Condition of vehicle

The performance of the car directly affects driving safety. If the car is not in good condition, accidents are bound to happen. For example, if the tires are not in good condition, they might leak or even burst, causing the car to lose control, leading to accidents. In addition, the braking system of cars might also malfunction from time to time. Therefore, traffic accidents are prone to occur if the vehicle is in a bad condition.

2.3. Traffic environment

Driving hazards are often also related to external environmental conditions, especially in the traffic environment where the situation is more complex. Traffic environment safety hazards mainly include traffic flow and natural environment. The traffic flow will directly affect the driver's level of attention to the road, thus affecting the probability of traffic accidents. In a heavy traffic, there will be unstable traffic flow, which increases the probability of traffic accidents. In addition, the natural environment is beyond human control and has a serious impact on traffic safety. Unfavorable weather conditions can affect normal driving; especially for drivers with little experience, the probability of accidents would be higher.

3. Driving hazards prevention and countermeasures

3.1. Improving the construction of traffic facilities

Traffic facilities are important for ensuring driving safety, which is of great significance for preventing hidden driving hazards. Drivers should have a certain safety awareness and follow the traffic rules. Good traffic facilities can provide drivers with reliable traffic information and protect the drivers. Besides, traffic facilities can also provide drivers with detailed road information for drivers to make corresponding judgment. In addition, road traffic facilities can also reduce the wear and tear on the car, increase the lifespan of the car, which makes driving safer.

3.2. Strengthening the assessment and training of drivers

Drivers should constantly improve their driving skills and safety awareness to prevent driving hazards and improve driving behavior. Many car traffic accidents are caused by human factors, so relevant departments should improve the standard of driver assessment and training to ensure that the drivers are proficient. Driving schools should focus on cultivating safety awareness among drivers. Secondly the driving assessment systems should also be inspected regularly to eliminate all fraudulent behaviors, to ensure that the driver assessment systems are in line with the relevant regulations. Lastly, severe punishment should be given to those who break traffic rules, so that drivers can always keep road safety in mind.

3.3. Improving road safety management system

The road safety management system should be improved to ensure the smooth flow of road traffic. Therefore, road safety management system should be improved to regulate the behavior of drivers. Advanced technology should also be utilized to form a database of road information for security management and to release corresponding road information in a timely manner. In this way, drivers can obtain comprehensive and detailed road information and road safety can be improved.

4. Personal experience

It is hard for me to describe how I felt when I got my own license. My first instruction was to get on Highway 57. It was a quick and challenging start to my driving life, to say the least. Driving was by no means easy or simple, but it really made me feel like an adult. There was this subtle feeling of bliss and confidence whenever I got out of the car. That aura of having more than what I usually possess was carried throughout the rest of my day. I cannot prove that this particular feeling was what led to how much I enjoyed those days, but I can tell you how much I enjoyed those days. Other than being able to drive myself around, I also no longer felt like a kid who needed their parents to take them to places they wanted to go to. There is a lot more to learn in driving and I would be responsible for my own safety and the safety of others.

Disclosure statement

The author declares no conflict of interest.

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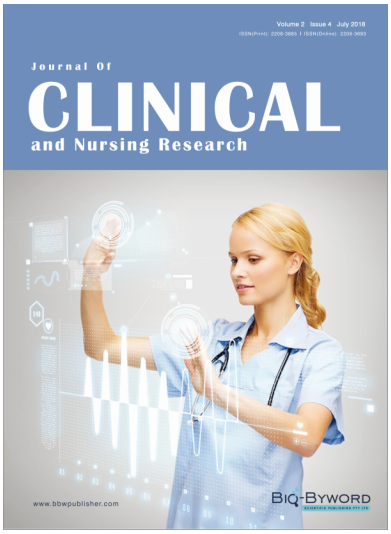

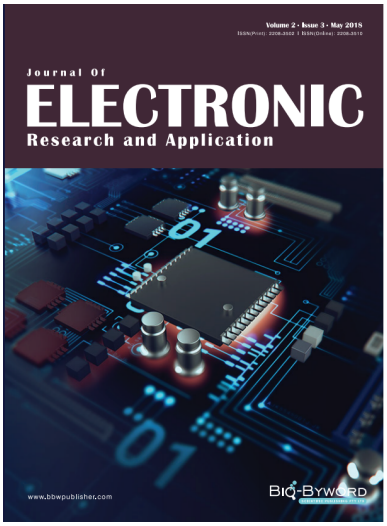

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