

# New Trend of Religious Studies and Digital Humanities Research

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**Abstract:** Based on computer technology, digital humanities research comprehensively analyzes religious education, predicts and evaluates its development law and evolution trend. Religion can be spread and inherited to a certain extent in the digital humanistic environment. This paper studies the new trend of religious studies and digital humanities research, aiming to explore the way of religious development and better understand the development of religion. This paper mainly uses the methods of statistical analysis and comparison to analyze the complex network of the religion of digital humanity and obtain relevant results. The experimental data shows that the development of Buddhism and Taoism is better in China's religious teaching, because the text classification accuracy and recall rate obtained through this model are above 0.8.

## 1. Introduction

Digital culture is the integration of humanistic knowledge and science. Digital humanities technology is an extension of traditional culture. It can enable us to have a deeper understanding of religious activities and academia, and also enable us to participate more in academic research. Due to the rapid development of digital humanities technology, we can study digital humanities on the basis of traditional religious education and modern computer multimedia, making it more perfect. The development of digital humanities technology provides a new method for the research of digital science and religion.

There are many theoretical achievements in the study of religion and its development trend and digital humanities. For example, in order to adapt to the development trend of digital humanities and "new liberal arts", some scholars have focused on the definition of digital education, the application of artificial intelligence in religious education and research, and the development planning of think tanks [1-2]. Other experts believe that we should attach importance to the development of digital technology and its relationship with human beings, and advocate the interaction and integration of science and technology with human beings [3-4]. Others believe that the harmony of local religious ecology is closely related to the harmony of social relations [5-6]. Therefore, it is the product of the times to study the trend of religious education and explore the relationship between digital humanity and religious development.

This paper first studies the digital humanities, and discusses the development mode of religious education through the description of the digital humanities. Secondly, it expounds the development of religion from its causes, its relationship with science and its development in China. Then it describes the application of complex network analysis in religion teaching. Finally, the final conclusion is drawn through the complex network analysis experiment of religious text classification.

## 2. Research on Religion and Digital Humanities

### 2.1 Digital Humanities

The framework of digital humanities research describes the general process of digital humanities research, and analyzes the necessary conditions and elements of research paradigm. This paper points out the importance of humanism theory from the perspective and train of thought of the digital humanities research framework. This paper provides a reference for risk control of digital humanities research. On this basis, open up a functional path [7-8]. Based on the principles of

independence and relevance, the research framework of digital humanities is shown in Figure 1:

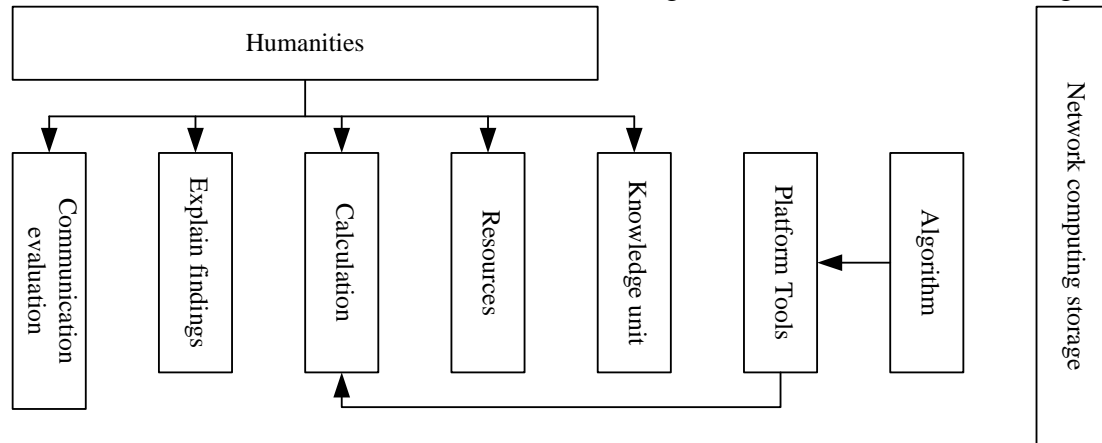


Figure 1. A Research Framework for the Digital Humanities

According to the technical conditions of network storage layer, a problem oriented design model is established. Under the guidance of the model, knowledge units are extracted from the resource layer and platform tools are selected. The knowledge unit is used for calculation and the data report is generated. Then communicate and evaluate. Big data, virtual reality/virtual reality, cloud storage and mobile devices emerge in endlessly. Digital evidence and research methods enable us to enter the digital academic era. Humanistic materials such as photos, picture books, music, ancient books, pictures, videos, etc. have been digitized, forming a large-scale, diversified and highly professional mass data set. Digital scientific resources, such as digital literature, databases and retrieval systems, have gradually become the basis of humanities research [9-10].

## 2.2 Development of Religion

Science and religion are ways to understand the world. It is undeniable that religion and science are two forces that affect the future development of mankind. In terms of the relationship between religion and science, its opposite relationship has been widely recognized and accepted by the academic community. With the development of science and technology, especially biotechnology, science has fallen into a dilemma. Many problems cannot be explained scientifically. There is also space for religion. Even according to some western scholars, there is no conflict between religion and science. Science can only solve real problems, while religion can solve natural problems. It is necessary to distinguish between two languages, religious language and scientific language. Religious language is based on ethics, mainly referring to human spiritual activities, while scientific language is based on accuracy, mainly exploring the natural field. The two languages do not interfere with each other [11-12].

The reason why religion came into being is that it was created to solve various human problems. Until today, religion has not wavered. As far as the world is concerned, the number of believers is not low, which indicates that religion still plays a role and the market still exists. If a person believes in a religion, he will inevitably demand the rules of this religion, which will inevitably have a critical impact on his thoughts and behavior. There is no doubt that the psychological value and philosophical value of religion are actually the crystallization of human spiritual wisdom and the long-term influence of religion and morality on society. Today, the development of religion is inseparable from these functions and functions, but it cannot be denied that religion is created artificially. It only works at a certain stage. From the perspective of scholars, the future development of religion can be divided into two types: one is the eventual demise of religion, and the other is the eternal existence of religion. In general, the development of opposition and integration will continue to be the main trend of the relationship between religion and science. The cognitive science of religion, the new trend of atheism and religious reaction are typical of this trend of thought. Although religion and science cannot coexist harmoniously, they are likely to view the world as two potentially complementary perspectives. Science can eliminate some blind cults,

but objectively it cannot eliminate the influence of religion [13-14].

The purpose of "World Religious Dialogue" is to correctly understand religious relations. This has certain guiding significance and practical value. Judging from the basic national conditions of Chinese religions, we must recognize that China is a multi religious country. At present, China has a large number of followers of Buddhism and Taoism. Although it is difficult to compile accurate statistics due to the lack of unified standards, there are two important characteristics: first, the followers of the two religions are mainly grass-roots people. The second is the localization of Buddhism in China [15-16].

### 2.3 Application of Complex Network Analysis in Religious Education

Network analysis is an important part of religious teaching. It is not only easy to process data, but also has higher visibility. In religious research, we found that complex network analysis can make the whole system clear, easy to understand and manage. Complex network analysis method establishes a large model with common attributes to describe the interaction mechanism between things. Secondly, through modeling, different connections or hierarchical relationships on each node are represented by topology diagrams. Finally, in each layer, all attribute information in the topology map is used to represent the degree of correlation between them [17-18].

In traditional network analysis, adjacency matrix is a plane data structure model, which is usually used to represent networks abstractly. However, with the huge information content and the diversity of information access, the content of network topology data becomes more and more rich and complex. For example, traditional social network analysis and research often focus on individual social relations in social activities, resulting in simple and homogeneous social network structure. However, in the online search environment of social networks, the social relationship between people is complex and multidimensional, which cannot be accurately represented by the previous simple model. With the development of internet crawler technology, a large amount of internet data can be obtained in a short time. Because of the large amount of data and information, it is urgent to establish a complex high-dimensional mathematical model. The high-dimensional characteristics of complex network models are mainly reflected in two aspects, one is the heterogeneity of network nodes, the other is the heterogeneity of network relationships.

The heterogeneity of network relationships means that there can be multiple relationships between network nodes at the same time. This kind of multilateral relationship is an exact expression of node relationship, and it is usually not gathered in a relationship without special restrictions. This kind of heterogeneous relationship is also called the multidimensional or multi-layer attribute of the network, and the network with this attribute is usually called the multi-layer or multidimensional network. The heterogeneity of network nodes means that network nodes belong to different categories. Different from traditional network analysis, nodes are homogeneous and have the same attributes. They can be uniformly processed and analyzed through relevant network algorithms. However, most algorithms can not be directly applied to heterogeneous node networks.

The external super adjacency matrix is also convenient to describe the roaming on multilayer networks. Another advantage of the super adjacency matrix over adjacent sensors is that it provides a natural way to represent node oriented multilayer networks that do not require additional empty nodes. However, the advantage of this method is expensive: multi-layer networks must be flattened to obtain super adjacent matrices, and some information in these aspects must be lost. However, the edge set is divided into internal edges, sandwich edges and coupling edges allow some information to be retained. Adjacent sensors in a single-layer network can be written as linear combinations of standard basis tensors:

$$Q_{\sigma}^{\tau} = \sum_{i,k=1}^M \rho_{ik} f^{\tau}(i) f_{\sigma}(k) = \sum_{i,k=1}^M \rho_{ik} F_{\sigma}^{\tau}(ik) \quad (1)$$

$f^{\tau}(i)$  represents the  $i$ -th indicator vector of the inverse tensor,  $F_{\sigma}^{\tau}(ik) \in S^{A \times M}$ . In multilayer networks, the representation of adjacent sensors must be extended. The model is based on

increasing information redundancy to improve data complexity. In general, there are many summation symbols in tensor computation. To make the expression more concise, we can omit the summation symbol under some conventions:

$$\sum_{i=1}^M x^i y_i = x^i y_i \quad (2)$$

These results are not usually derived directly from the tensor model, but can be rewritten concisely and elegantly with the adjoint tensor method.

The recognition and mining of community structure is an important research direction of complex network analysis theory. Based on the theory of spectrum segmentation, a spectrum clustering algorithm is proposed. Block model algorithm is based on the block model expression of adjacency matrix to solve the optimal community partition in the network. In a block model with only members, it is usually necessary to solve the square programming problem to get the final solution. Hierarchical clustering algorithm is a simple and effective community discovery algorithm. According to the results of the algorithm, it can be divided into overlapping community algorithm and non overlapping community algorithm.

### **3. Complex Network Analysis Experiment of Religious Text Classification**

#### **3.1 Experimental Basis**

In the research of complex networks, LFR criterion is a good framework to compare the performance of community discovery algorithms. However, the traditional lfr standard is the testing framework of the traditional single-layer network, which needs to be extended to the multi-layer network model. In order not to destroy the structural properties of each layer of the network, our expansion cannot destroy the basic parameters of the network.

#### **3.2 Experimental Data Set**

Text classification corpus is an effective tool to test the performance of classification algorithms. In order to make the experimental data more accurate, the text classification corpus of Sogou Lab is used in this paper. The classified corpus of this paper contains terms related to Taoism, Buddhism, Islam, Catholicism, Christianity and other religions. The corpus downloaded in this paper contains 6000 words by category.

#### **3.3 Performance Test**

This paper uses accuracy, recall and f value to classify the commonly used performance evaluation indicators. Accuracy and recall are the test indicators in the field of information retrieval, and f value is the function assignment of the two, which can fully reflect the classification performance of the classifier. However, in this experiment, we should pay more attention to the recall rate of the classifier: it checks the probability that the samples of a specific category are recalled to the correct category after the classifier analysis, and emphasizes the integrity of the classification performance. RtextTools is an R package that uses supervised machine learning methods to classify texts. It contains the code of 9 classifiers, including SVM, KNN, decision tree and neural network. Use the rtextbooks package to classify text. First, enter a text set in CSV format. Rtexttools converts text into a vector space format represented by document entries. Then the text set is divided into training set and test set according to the parameters. After setting the K value, select one or more classification methods to form a classifier.

### **4. Analysis of Experimental Results**

#### **4.1 Performance Index under Algorithm Improvement**

The experimental data are input into the traditional KNN classifier and the improved KNN classifier respectively, and the accuracy, recall and F value of each output category are statistically

analyzed. Among them, the classification accuracy, recall rate and F value of the improved KNN classifier for religion are shown in Table 1:

Table 1. Performance Metrics under the Algorithm Improvements

	Accuracy	Recall rate	F value
Buddhism	0.85	0.9	0.875
Taoism	0.81	0.85	0.83
Islam	0.78	0.8	0.79
Christianity	0.76	0.8	0.78
Catholicism	0.8	0.86	0.83

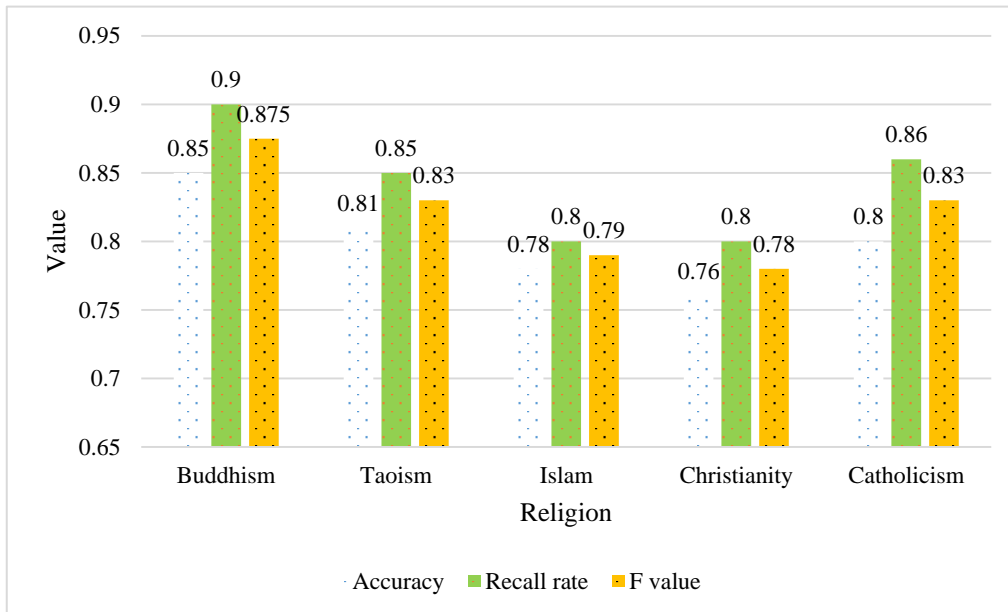


Figure 2. Performance Metrics under the Algorithm Improvements

As shown in Figure 2, we can see that among the improved KNN classifiers, Buddhism has the highest recognition accuracy and recall rate. This is because Buddhism has the largest number of believers in China. Secondly, the recognition accuracy and recall rate of Taoism are also relatively high. It shows that Taoism and Buddhism in China have developed best among the five religions.

#### 4.2 Classification Results of Religious Texts

In this experiment, KNN classification algorithm is used for classification, in which the included angle cosine method is used for text similarity calculation, and the formula is as follows:

$$S(a, b) = \cos \alpha = \frac{a^s b}{\|a\| \|b\|} \quad (3)$$

The experiment was divided into five groups. The first two groups are feature selection algorithms based on the complex network method proposed in this paper. Information retrieval method is represented by I, document frequency method is represented by D, and square root test method is represented by C. The final details are shown in Table 2:

Table 2. Text Classification Results

	200	400	600	800	1000
Complex network 1	75.2	77.4	79.6	80.8	81.8
Complex network 2	74.7	76.8	79.3	80.5	81.5
I	73.1	75.2	76.8	78.5	79.3
D	67.8	69.9	71.5	73.3	74.7
C	72.4	74.5	76.2	77.7	78.4

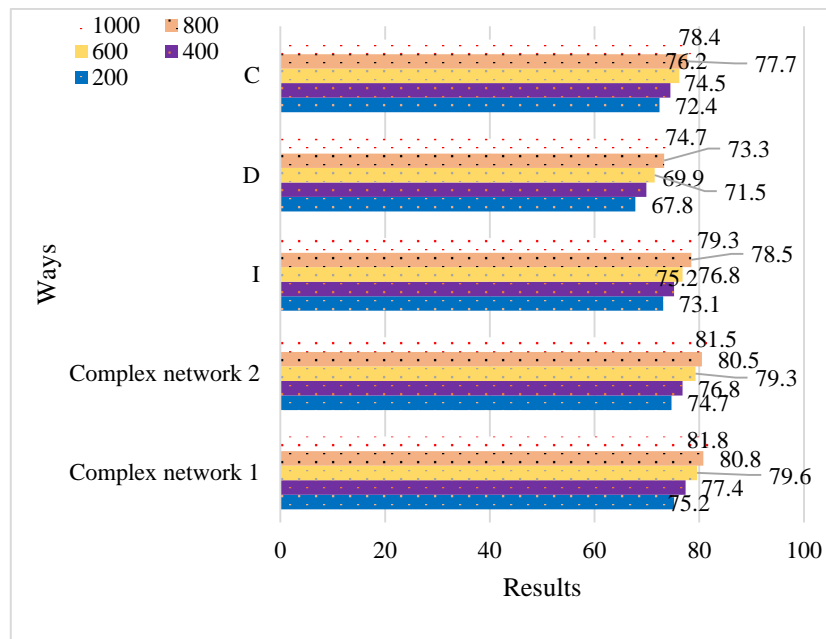


Figure 3. Text Classification Results

As shown in Figure 3, we can see that in the complex network analysis, the traditional data results of the information gain, the document frequency and the open square test are smaller than those of the complex networks 1 and 2. This means that the classification effect of text feature selection in traditional methods is not obvious.

## 5. Conclusion

The development of digital humanity is the innovation of traditional culture and religious theories, ideas and methods. The development of digital humanities technology has promoted the innovation of the teaching mode and content of the discipline of religion to a certain extent, which is of great significance in cultivating students' scientific literacy and improving their comprehensive quality. Complex network analysis technology provides a new perspective for religious studies. It breaks the drawbacks of isolation and closure in traditional information science. At the same time, it also brings new ideas and methods to people and has some impact on modern social life. It is not only simple statistics, processing, classification and prediction of data; It can also combine data mining and modeling technology to realize information sharing, knowledge discovery and integration. Digitalization is an important channel for the spread of religion.

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