

Research on the Construction of Legal System of Religious Property Rights based on Big Data Technology

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Abstract:

In order to improve the scientific nature of the legal system of religious property rights, this paper combines big data technology and echo network technology to analyze the legal system of religious property rights, and proposes a DTDR-HCRJ network method. The method combines dynamic time delay based data reconstruction and HCRJ neural network to perform multivariate time series prediction for religious property rights data analysis. Moreover, according to the distribution and degree of variation of dynamic time delays, this paper tailors the time dimension and span of the corresponding multivariate data for each predicted value. Through the experimental research, it can be seen that the legal system model of religious property rights based on big data technology based on this problem has certain effects.

Keywords: big data technology; religious property rights; law; institutional system

1 INTRODUCTION

Religious economy is the operation mechanism of material wealth formed around religious organizations with religious organizations as the main body. Religious economy can be divided into broad and chivalrous. Among them, the religious economy in a broad sense refers to all religious activities related to material wealth, including accepting donations, producing, selling, providing religious services for remuneration and all other business activities related to religion [1]. The chivalrous religious economy refers to commercial activities such as production and sales for the purpose of obtaining economic benefits. There are two levels of problems in the religious economy. One is the issue of religious property, and the other is the issue of economic activities of religious groups, such as production, sales and other commercial activities. The religious economy is an economic phenomenon that exists in a market economy, that is, it is very different from other economic phenomena, such as the corporate economy. One is that the subject is different. The main body of the religious economy is religious organizations, and the other economies are companies, individuals, and other legal persons [2]. The second is a different purpose. The biggest feature of the religious economy is that it is not for profit, which is also an important reason for taking religious groups as public-interest legal persons among corporate legal persons. However, other economies engage in economic activities for profit. The third is the different scope of activities. The scope of activities of the religious economy is relatively narrow, only engaging in activities within a relatively narrow scope such as self-support and public welfare assistance, while the scope of activities in other economies is much larger [3]. The fourth is the difference in the law of activities. The religious economy is guided by religious teachings, while the economic activities of other economies are regulated by the rules of the market economy [4].

When discussing the ownership of religious property, the first problem to be solved is what standard and method should be used to identify or divide the ownership of religious property. This is an important theoretical and practical issue that must be clarified [5]. The current religious property policy has played an irreplaceable role in implementing the protection, management and use of religious property, but it defines religious property as "owned by the Chinese church", "owned by society", "owned by the state", "owned by the collective", "Owned by religious associations" has legal flaws and inadequacies [6].

For religious consortium legal persons, it should be emphasized that its legal representative and other clerical personnel with management responsibilities only have the right to manage religious property. In the case of no management, the property of religious consortium legal person should be nationalized [7]. Second, for the state-owned religious property, it should be clear which department should supervise it, establish relevant systems, and clarify the legal responsibility for the loss of state-owned property caused by neglect of duty [8]. Third, in the case of private ownership of religious property, the scope of private ownership should be clarified, it should be emphasized that individuals cannot appropriate donations from others in the name of religion, and

relevant legal responsibilities should be stipulated. Secondly, the relevant administrative regulations must pay attention to the regulation of religious legal persons when making specific regulations for religious legal persons. The religious legal person system is the main system for the regulation of the entire religious activities. Religious legal persons should pay attention to the distinction between religious foundations and religious associations. Among the religious legal persons, the religious consortium legal person can be said to be the main part of the religious legal person system [9]. In most religious organizations, many cases are a mixture of corporate corporations and corporate corporations, that is, some believers gather together, and many believers donate money and materials to engage in many religious activities. Such a religious organization cannot simply be identified as a corporate legal person or a corporate legal person, it is a mixed legal person. In legislation, separate management of religious legal persons may be considered. On the one hand, for the legal person side of the consortium, religious organizations should be specifically required to set up an organization equivalent to the "Board of Supervisors" to conduct internal supervision of the money and goods donated by the majority of believers, and require such organizations to be responsible for the Administration of Religious Affairs [10]. After the majority of believers donate money and goods, they lose their ownership of the money and goods, but this does not mean that believers have lost all rights. The majority of believers have the right to supervise the property status of religious organizations and report problems to the relevant departments. On the other hand, for the corporate legal person side, the main consideration is the issue of organizational personnel [11]. Relevant religious administrative regulations should make more detailed provisions on its establishment, internal organization, and the formulation and adoption of bylaws. As an association legal person is mainly funded by the members of the organization, when the religious organization is terminated, the relevant property should be returned to the members of the organization. However, the organizational members of a consortium legal person only have the right to manage the property, and they manage the property donated by the majority of believers. In this way, when the legal person is terminated, the property cannot be returned to the organizational members, and should be nationalized for public welfare [12].

Looking at the legal system of religious property in some developed countries in the world, it is basically the usual choice for most countries to grant legal personality to religious organizations, which provides a standardized legal basis for the management of religious property, and also provides benefits for the handling of matters related to religious property. For reference, giving religious organizations legal personality can easily clarify the ownership of religious property and carry out effective management, which is very necessary for: (1) With the development of religious self-support, religious organizations passively or actively conduct business activities, religious groups already have the nature of market economic subjects [13]. (2) If the subject of religious property rights is unknown, it is impossible to effectively solve the problem of religious property management and disposal, and it is easy to separate ownership and management rights, which is extremely unfavorable for the protection of religious property. Therefore, establishing a system of ownership of religious property that is independent of the property of members or donors is an effective system design to protect religious property, while giving religious groups legal person status is to clarify the independent status of religious property. To distinguish them, to establish the right of use and management of religious property by religious clerics, and to form a management and supervision system for religious property by believers and society [14]. (3) It is necessary to determine the ability of religious groups to independently assume responsibility. At this stage, religious groups have become the main body of the market economy and participate in civil activities with their own property. However, once debts are formed, religious property is not tradable because of its sacredness, or because many religious properties are national cultural relics, which is easy to cause Creditors cannot recover debts or attribute debts to individual monks as administrators and users. Therefore, it is not only detrimental to the protection of creditors' rights, but also easily leads to confusion between the personal debts of monks and nuns and the debts of religious groups [15]. By giving religious groups the status of civil subject, and in their capacity for responsibility, the property that cannot be held liable, such as cultural relics, instruments, and religious properties, is excluded, and only the property that can be used as debt repayment is regarded as its capacity for responsibility property range [16].

"Religious legal person" is an independent legal person form and a new system. If it is fully introduced, it will bring uproar to current laws and regulations and future legislation. Religious activity sites mainly refer to temples and temples and other legal establishments that carry out religious activities. Places are generally

managed by corresponding personnel and institutions, and their properties are mainly derived from donations from believers and income from self-supporting undertakings. They have strong financial compatibility and can be registered as religious foundations, with independent accounting and self-management. [17]. In this way, the separation of registration can more clearly straighten out the property relationship between religious groups and religious activity venues without causing huge changes to the existing laws, and then adopt a classified management strategy to clarify the ownership of religious property, which can not only ensure the religious organization's religious Sex does not prevent it from participating in secular economic activities, so it can solve the embarrassing situation of religious groups and places of religious activities, and is the best choice for the system of religious property ownership[18].

This paper combines big data technology and echo network technology to analyze the legal system of religious property rights, and improves the scientificity of the legal system of religious property rights through intelligent models.

2 MINING ALGORITHM FOR LEGAL DATA OF RELIGIOUS PROPERTY RIGHTS

2.1 Echo state network

Similar to the general RNN structure, ESN adopts a typical three-layer structure, that is, the input layer, the hidden layer, and the output layer are composed as shown in Figure 1. Since the reserve pool is constant during operation, the output weights are used to predict the curve dynamically, which greatly reduces the defects caused by the traditional iterative algorithm.

The connection method of the overall network is shown in Figure 1. It is assumed that there are M input neurons in the left input layer, N neurons in the middle reserve pool, and L output neurons in the right output layer. In the reserve pool structure, solid arrows indicate fixed connections, and dashed arrows indicate optional presence or absence. The input $u(t)$, the reserve pool $x(t)$, and the output $y(t)$ are recorded at time t respectively, and the corresponding states of the three are as follows:

$$u(t) = (u_1(t), u_2(t), u_3(t), \dots, u_M(t)) \quad (1)$$

$$x(t) = (x_1(t), x_2(t), x_3(t), \dots, x_N(t)) \quad (2)$$

$$y(t) = (y_1(t), y_2(t), y_3(t), \dots, y_L(t)) \quad (3)$$

In addition, there is also the connection weight W_{back} between the output layer at the previous moment and this moment, and the corresponding dimension is $N \times L$. At every moment, the behavior advancement and the reserve pool have to update the state, and the state update equation is:

$$x(t+1) = F(W_{in} u(t+1) + Wx(t) + W_{back} y(t)) \quad (4)$$

Generally, the tanh or sigmoid function is used. From this, the output state equation of the ESN can be obtained as:

$$y(t+1) = F_{out} \cdot (W_{out}(u(t+1), x(t+1), y(t))) \quad (5)$$

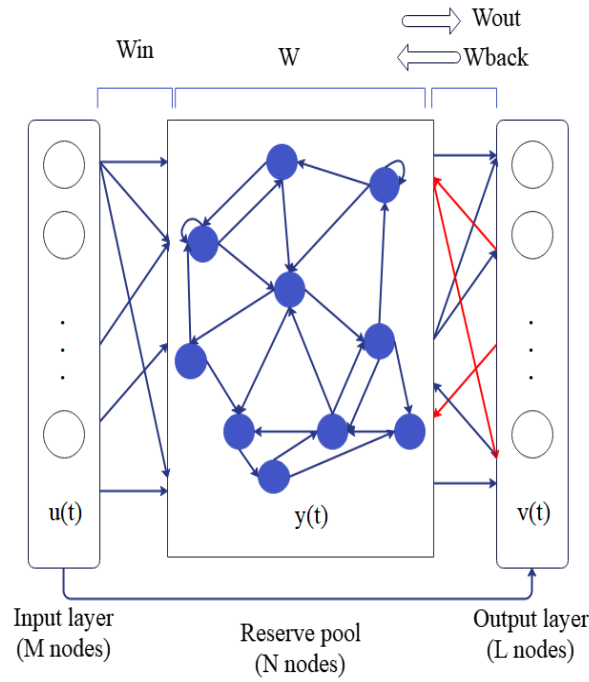


Figure 1 ESN connection structure

In addition, in order to maintain the echo characteristics of the entire network architecture, the spectral radius SR is the absolute value of the largest eigenvalue of the connection weight matrix W , and the spectral radius SR is reduced to $(0, 1)$, which is a necessary condition for the stable operation of the echo state network.

All the ESN-like models in this paper use the ridge regression algorithm to train the output weights. The core is to add a regular term to the original squared error on the traditional pseudo-inverse method. The formula is as follows:

$$L = \sum_{i=1}^n (Y_i - X_{ij} W_{out})^2 + \sum_{j=0}^p \lambda W_{out}^2 \quad (6)$$

After obtaining the derivative of the optimization function L with respect to W_{out} , the derivative is then tended to 0 to solve the value of W_{out} . The derivation results are as follows:

$$W_{out} = (X^T X + \lambda I)^{-1} X^T Y \quad (7)$$

We assume that there are n variables in the overall multivariate data set, and each object has m indicators. The normalized data is $x_1, x_2, x_3, \dots, x_n$. The reference sequence x_0 is specified, so that the correlation coefficient between x_0 and each correlation sequence x_i about the k -th index is:

$$\xi_i(k) = \frac{\Delta \min + p \Delta \max}{\Delta i(k) + p \Delta \max} \quad (8)$$

Among them, $i = 1, 2, \dots, n; k = 1, 2, \dots, m$.

$$\Delta \min = \min_i \left[\min_k (|x_0(k) - x_i(k)|) \right] \quad (9)$$

$$\Delta \max = \max_i \left[\max_k (|x_0(k) - x_i(k)|) \right] \quad (10)$$

The selection of the resolution coefficient p is very important to the overall result, and its value range is $[0, 1]$. In this paper, according to the entropy weight method, after removing the interference of subjective factors, the appropriate value is generally about 0.5 as the discrimination coefficient of the correlation between variables.

It is necessary to focus on one value and calculate the average value of the correlation coefficient of each sampling time (each point in the curve) in the form of an average, and finally use it as a measure of the similarity of the correlation degree between the target variable and the reference variable. Combining the above steps, the correlation between the k -th index and the reference sequence can be obtained as follows:

$$\gamma_k = \frac{1}{n} \sum_{i=1}^n \xi_i(k) \quad (11)$$

The data distribution of static delay and dynamic delay is shown in Figure 2, where TD represents time delay. In the field of time series analysis of religious property rights data analysis, if the data processing is not carried out effectively according to the time delay information, the representational significance of the overall data model will be lost.

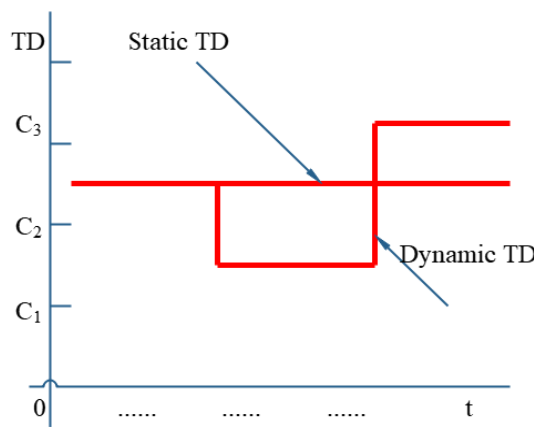


Figure 2 Dynamic and static delays

In order to rely on data knowledge relatively independently and make the technical support of skilled workers relatively less possible, the concept of similarity analysis is generally used to extract the dynamic delay information between variables.

First, two time series X, Y are defined, U_x and U_y are the mean of N data, R_x and R_y are the standard deviation, and the overall delay is m . The similarity correlation coefficient equation between time series is as follows:

$$P_{xy}(m) = \frac{E[(X_i - U_x)(Y_{i+k} - U_y)]}{R_x R_y}, m = -n+1, L, n-1 \quad (12)$$

When the absolute value of P_{xy} is the largest, the corresponding m is the static delay between the overall time series.

The static delay information can provide support for the subsequent extraction of dynamic delays. Based on statistical knowledge, S_x, S_y is the sample standard deviation, and the coefficient value of the similarity of the data segment is obtained by calculating the sample expectation, as shown in the following formula, thereby extracting the dynamic delay information of each time point between variables.

$$\hat{P}_{xy(i)}(k_i) = \frac{1}{n_k} \sum_{j=i}^{i+n_k} \frac{(X_{j-r} - U_{x(j)})(Y_{j+k-r} - U_{y(j+k)})}{S_{x(j)} S_{y(j+k)}}, i = 0, L, n \quad (13)$$

The moving range of the window is determined after judging the trend of the current data and the process situation based on experience. In general, $\lambda_k = W_1 * m$, where W_1 is the empirical coefficient, and m is the delay corresponding to the overall data segment. The time window sliding process is shown in Figure 3.

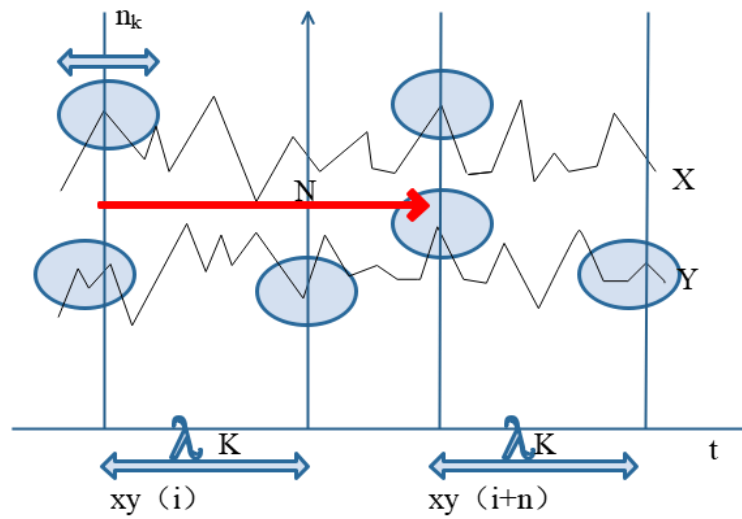


Figure 3 Time window sliding process

The correlation coefficient $P \in [-1, 1]$ between the description variables, the positive and negative influence relationship between the process variables is determined by the positive and negative values. Although most religious property rights data analysis models can roughly judge the positive and negative effects between variables through prior knowledge, the data-driven approach also adds a certain degree of interpretability. The time delay $\lambda(i)$ of the variables X and Y at the current moment can be determined by observing the maximum value $P_{xy(i)}^{max}$ and the minimum value $P_{xy(i)}^{min}$ of the correlation coefficient between the variables in the window, as follows:

$$\lambda(i) = \begin{cases} k_i^{max}, & \text{if } P_{xy(i)}^{max} \geq -P_{xy(i)}^{min} \\ k_i^{mix}, & \text{if } P_{xy(i)}^{max} < -P_{xy(i)}^{min} \end{cases} \quad (14)$$

The core of the overall algorithm is the size of the observation window n_k , and its expansion judgment is based on the current time window: (1) Whether there is a situation where the similarity value of the reverse delay (the overall delay direction is positive) between time series is too large due to local strong interference. (2) Whether the absolute value of the correlation coefficient between variables is greater than the absolute value of the correlation coefficient of the variables under the entire piece of data. The specific flow of the overall algorithm is shown in Figure 4.

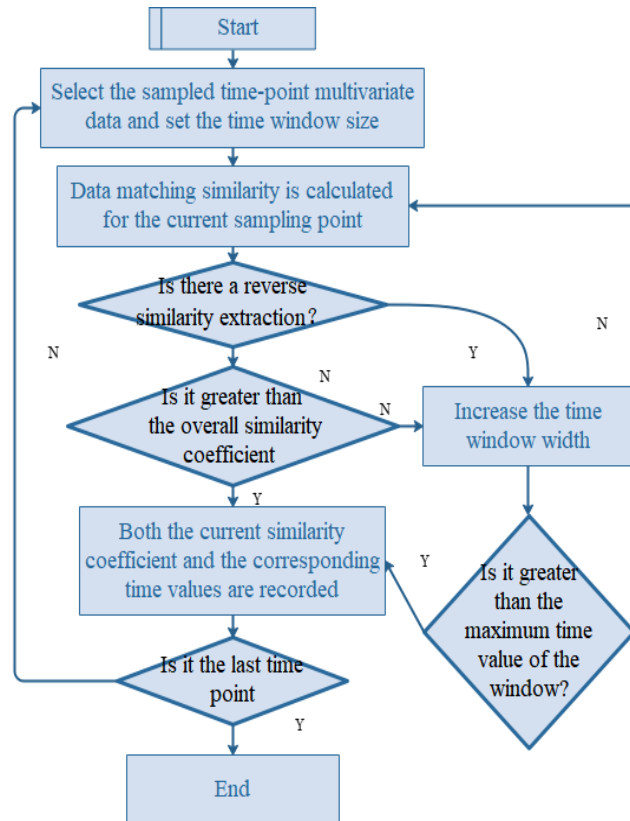


Figure 4 The process of extracting the delay from the expansion and contraction time window

2.3 HCRJ network model

The deterministic hopping cyclic state network (CRJ) shown in Figure 4 is a variant of ESN, and the essence is that the ESN is optimized from the reserve pool topology. The intermediate nodes in the CRJ reserve pool are connected by one-way loop edges and two-way jump edges, and all input weights, loop weights, and hop weights share weights respectively. The CRJ model has a fixed regular topology, all the cyclic connection weights are $W_c > 0$, and all the jump weights are also $W_j > 0$. The state update equation of the reserve pool is no different from the general ESN. Subsequent studies have proved that the connection structure of the CRJ network's reserve pool is comparable to that of the traditional ESN sparsely connected reserve pool in some time series prediction. To a certain extent, this structure solves the defect that the ESN reserve pool is randomly generated, and once generated, it remains unchanged during the entire network operation process. Therefore, the CRJ network has a wide range of applications in many engineering fields.

In this paper, the Wavelet-Tanh hybrid neuron model is adopted, and a certain proportion of wavelet set neurons is injected into the reserve pool, so that there are two neuron models of wavelet and hyperbolic tangent in the reserve pool. The excitation function based on the wavelet model is as follows.

$$y = \varphi(x) = xe^{-0.5x^2} \quad (15)$$

In order to adapt to the complex religious property right data analysis process data, slight changes are made in the excitation method of wavelet neurons for each specific application, as shown below:

$$\varphi_{d,n}(x) = 2^{0.5d} (2^d x - n) e^{-0.5(2^d x - n)^2} \quad (16)$$

$$n_j = \frac{j}{NR_{mix}} - 0.5, d_j = \frac{j}{NR_{mix}}, (j = 1, 2, L, NR_{mix}, NR_{mix} \in Z) \quad (17)$$

Among them, the distribution of neuron functions of many wavelet sets is shown in Figure 5. This is by

changing the value of the parameter d, n to make the neuron model show different characteristics. Among them, the parameters are affected by the number of neurons in the overall reserve pool N and the proportion R_{mix} of wavelet neurons, which are updated as formula 17.

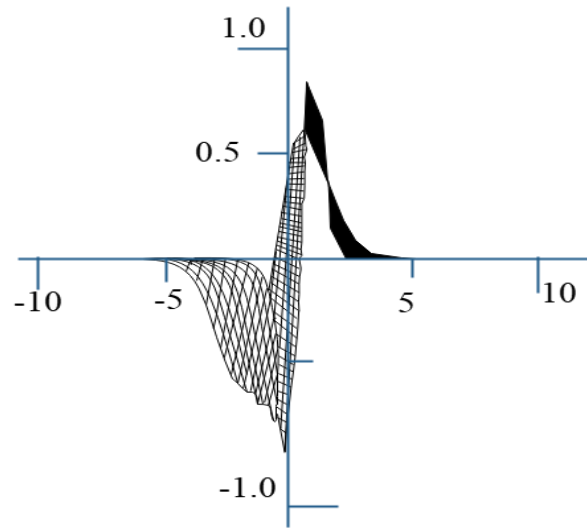


Figure 5 Wavelet set function

The key to building the network as a whole is the method of injecting wavelet neurons into the reserve pool. The structure shown in Figure 6 is that the proportion of wavelet neurons in the reserve pool is 50%, and the external loop structure adopts the method of injecting neurons alternately. The internal jump structure adopts the jump connection (T-W) mode of hyperbolic tangent neurons and wavelet neurons. This injection method is also the optimal combination method for multivariate time series prediction tasks in the drilling background, which will be proved by tests later. When $u(t)$ is input over time, the reserve pool update state equation becomes:

$$x(t+1) = F(W_{in} u(t+1) + Wx(t) + W_{back} y(t)) \begin{cases} f = \tanh(x), & (\text{if } \tanh) \\ f = \varphi_{d,n}(x), & (\text{if wavelet}) \end{cases} \quad (18)$$

The weight characteristics of *HCRJ* network and CRJ network are consistent, and all input weights, loop weights, and hop weights share weights respectively. W_{out} can be determined according to the target output y , so that the gap between $y(t+1)$ and $y(target)$ is as small as possible. The network uses the ridge regression algorithm to train the network and obtains an estimate of the weight W_{out} by the pseudo-inverse method. Therefore, the ridge regression algorithm does not include the iterative process, which can fundamentally avoid the problems in the iterative prediction process and apply it to practice.

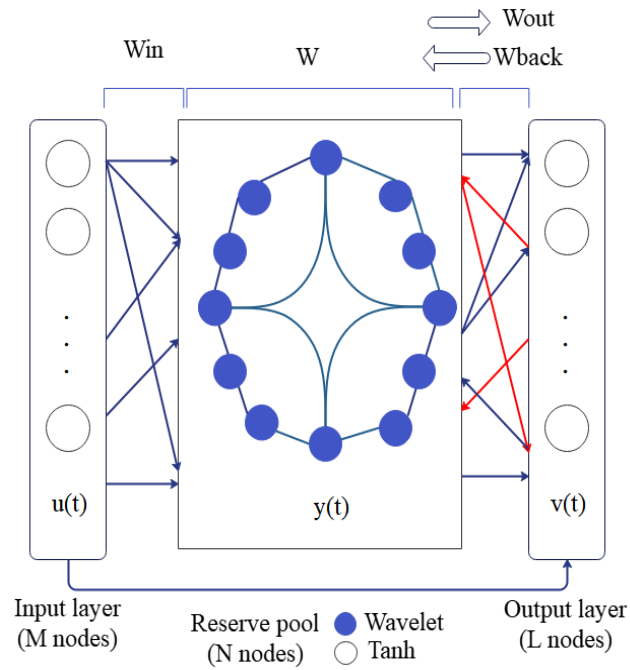


Figure 6 HCRJ network structure

2.4 Multivariate data information reconstruction methods

First, the degree of dynamic delay variation in history is described, as shown in Equation 19. In addition, in order to better adapt to the dynamic changes of the prediction model, λ_t should be updated adaptively over time. Equation 20 describes the normal degree of time delay of the data that should be selected, where τ_{t+k} represents the time delay between the predictor and related variables at the moment of prediction.

$$\lambda_t = \frac{1}{c} (|\tau_t - \tau_{t-1}| + |\tau_{t-1} - \tau_{t-2}|L + |\tau_{t-c-1} - \tau_{t-c}|) \quad (19)$$

$$|\tau_{t+k} - \lambda_t| \leq \tau[normal] \leq |\tau_{t+k} + \lambda_t| \quad (20)$$

Finally, outliers related to multivariate time series are replaced by dynamic time delay information, thus obtaining the optimal time span to adapt to the operating environment. According to the time location and span, the multivariate data suitable for prediction time series is adaptively selected during network learning and work, as shown in Figure 7.

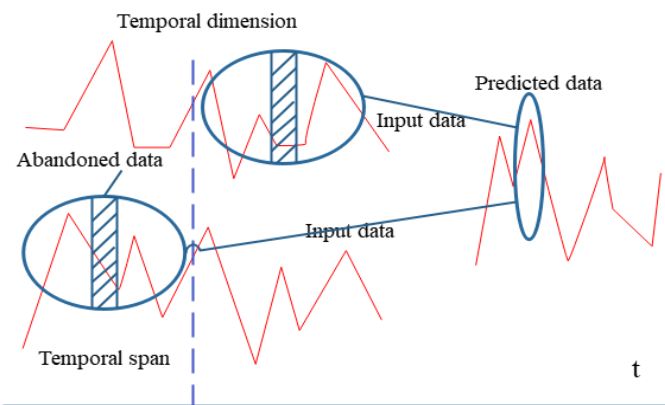


Figure 7 Corresponding multivariate data time dimension and span

2.5 DTDR-HCRJ prediction model

If the prediction task is the time series prediction of two variables, A and B, where B is the predictor variable, A is the related variable, and the prediction step size is k. The mainstream multivariate time series prediction method based on RNN is as follows:

$$B_{t+k} = F_{A,B}(A_t, A_{t-1}, L, A_{t-n}, B_t, B_{t-1}, L, B_{t-m}) \quad (21)$$

In the formula, A_t and B_t are used to describe the value of the variable at the current moment, n and m represent the length of the input variable, and B_{t+k} is the value to be predicted (and so on for time series tasks greater than two variables). Due to the common delay in the data analysis of religious property rights or the transmission of multivariate variables in some other fields, the improved prediction method is as follows:

$$B_{t+k} = \begin{cases} F_{A,B}(A_{t+k-\tau}, A_{t+k-\tau-1}, L, A_{t+k-\tau-n}, B_t, B_{t-1}, L, B_{t-m}) & (\tau \geq k) \\ F_{A,B}(A_t, A_{t-1}, L, A_{t-n}, B_t, B_{t-1}, L, B_{t-m}) & (\tau < k) \end{cases} \quad (22)$$

Among them, τ represents the time delay between the B variable and the A variable at time t, and the time delay exists positive and negative. The situation in the formula is that the B variable is a lag variable relative to the A variable, and τ is a positive value. In the process of data analysis of religious property rights, operators and managers generally pay more attention to predicting variables that are relatively lagging behind, that is, the changing trend of dependent variables. Therefore, the theoretical analysis based on time delay can be concluded that if $\tau \geq k$ is used in the actual prediction task, the relevant variable A that affects the value of B_{t+k} has changed. That is, the corresponding maximum contribution value $A_{t+k-\tau}$ can be obtained, and the accurate input of the value of this related variable into the network will definitely improve the prediction performance. If $\tau < k$, the value A_t of the relevant variable closest to the time node should be input, and there are few predictions of such a high step size in the general religious property right data analysis process.

3 RESEARCH ON THE CONSTRUCTION OF LEGAL SYSTEM OF RELIGIOUS PROPERTY RIGHTS BASED ON BIG DATA TECHNOLOGY

The legal status information system framework is shown in Figure 8. The legal status information cleaning framework is divided into a basic processing stage and a sequence processing stage. Data processing is carried out using the echo model in this paper.

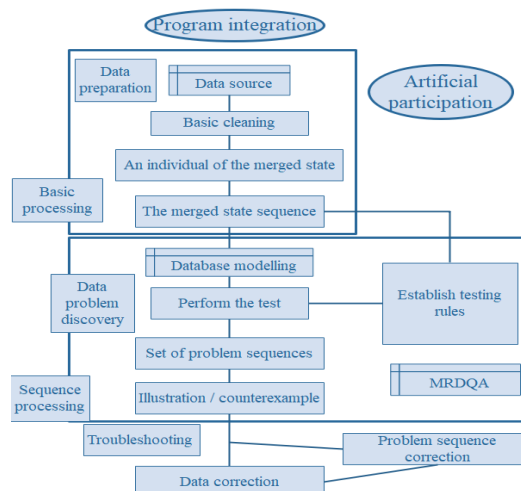


Figure 8 Framework diagram of legal status information system

Combined with the legal practice of religious property rights, a framework for discovering legal issues of

religious property rights is constructed, as shown in Figure 9.

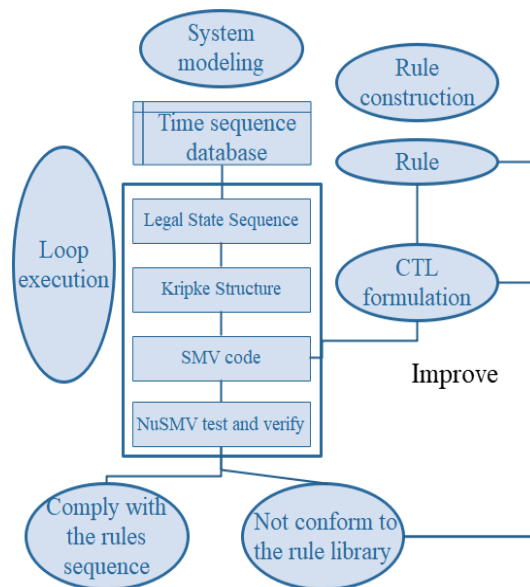


Figure 9 Framework for the discovery of legal issues of religious property rights

The effect of the legal system model of religious property rights based on big data technology proposed in this paper is verified, and the cluster analysis is carried out through multiple sets of data, and the results shown in Figure 10 are finally obtained.

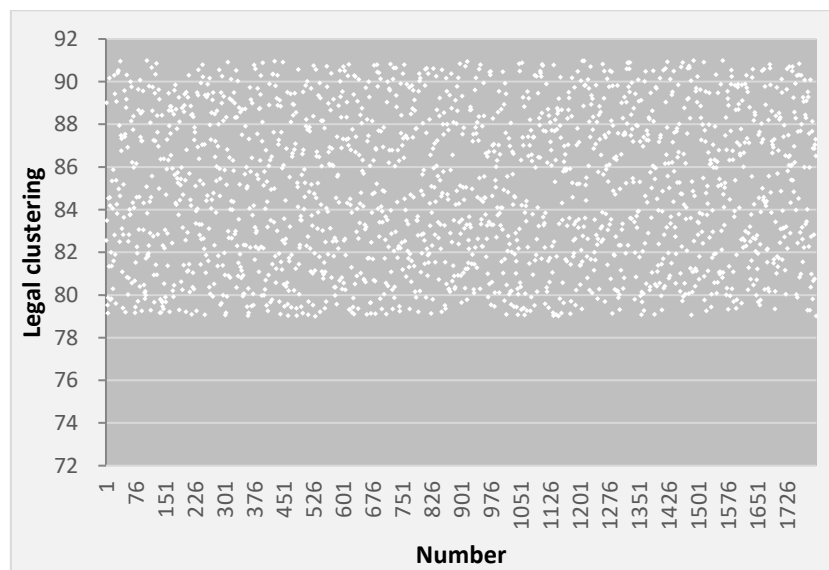


Figure 10 Cluster analysis of the legal system model of religious property rights

Through the above research, we can see that the legal system model of religious property rights based on big data technology based on this problem has certain effects.

4 CONCLUSION

Any human activity is inseparable from the support of material conditions, and the same is true for religious organizations and activities. The existence and development of religious economy is the material prerequisite for the existence of religion. In the long history of its emergence and development, its teachings, organizations, venues, believers and religious activities are closely related to its own economic foundation, and cannot exist independently of the economic life of the society. Because of this, the development of religious economy has

become inevitable. Ownership of religious property refers to the right of the right holder to freely dispose of religious property within the scope stipulated by law and exclude others from interference, including the rights to possess, use, gain and dispose of. This paper combines big data technology and echo network technology to analyze the legal system of religious property rights. Through experimental research, it can be seen that the legal system model of religious property rights based on big data technology has certain effects.

ACKNOWLEDGE

"Research on the Legal Status quo of Monastic Property in Tibetan Buddhism" 2019 University-level special project of ABTU, Sichuan Province Subject No.ASZ20-05.

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