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Research Article

Implementation of Intelligent Decision Model of Traditional Hanfu 3D Design Based on Internet of Things

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In view of the problems existing in the design and application of traditional Hanfu, in order to better promote the application prospect of the Internet of Things in traditional Hanfu, the adaptive estimation model is adopted to analyze the relevant algorithms. Based on the Internet of Things theory, the optimized intelligent decision model is obtained, and the relevant parameters of the model are modified so as to obtain the application of traditional Hanfu in 3D simulation design based on the Internet of Things theory. Finally, the optimized model is used to predict and analyze the design and application of traditional Hanfu. The results show that the value of the Internet of Things in 2021 is 880, an increase of about 8.6 times compared with 102 in 2011, indicating that the industry shows a strong growth trend. In addition, the growth rate of the Internet of Things from 2018 to 2021 is low, indicating that the output value of the Internet of Things in this stage is relatively stable, and it also reflects from the side that the Internet of Things has entered a stable growth period. With the increase in the number of iterations, the corresponding curves of the two original trust degrees show little change, and the original trust degree curves are mainly divided into the stage of slow rise and the stage of steady increase. The influence of the optimization model on the willingness to trust is obvious, showing varying degrees of increase. Different calculation methods describe the test data differently. The mathematical estimation method shows an approximate linear trend. The result estimation method shows the change in the quadratic function. The key decision rules have the characteristic of subsection. Data method has strong fluctuation in the early stage. Objective function method can better describe the characteristics of traditional Hanfu. This study realizes the design and application of traditional Hanfu in the field of 3D simulation based on the Internet of Things theory so as to provide a theoretical basis for the application and research of the Internet of Things in other fields.

1. Introduction

As a new research method, the Internet of Things is playing an important role in various fields, and the corresponding Internet of Things theory has a wide range of applications in data encryption, network security, intelligent agriculture, optical fiber sensor, smart grid, and healthcare industry [1]. In view of the problems existing in network encryption, Guo et al. [2] proposed a secure and efficient outsourcing encryption model based on the relevant theories of the Internet of Things system, which can provide corresponding query schemes for relevant data with uncertain data range. On the basis of the original estimation model, the model introduces the relevant basic theories of the Internet of Things cloud platform and revises the relevant parameters in the model by analyzing the data so that the obtained optimization model can provide relevant schemes for network encryption accurately. In order to verify the accuracy of the model, by collecting different types of data to compare and analyze the model, the research results fully prove the superiority of the model, which can provide a theoretical basis and guidance for the application of the Internet of Things in network security. There are many problems and challenges in the application and popularization of intelligent Internet of Things. In view of the existing related problems, Wei et al. [3] first analyzed the management and construction of the Internet of Things by way of illustration. In order to solve these problems, the knowledge of intelligent manufacturing and other fields is introduced into the field of Internet of Things so as to build a new intelligent Internet of Things research platform, which can improve accurate and efficient services for the Internet of Things in data management, data mining, data analysis, and other aspects. In order to further study the accuracy of the platform, the Internet of Things platform is used to calculate the case of intelligent transportation, and the optimization results can provide further upgrading and management for the development of intelligent transportation. The development of traditional agriculture in modern society is faced with the outstanding problems of unreasonable agricultural structure and low degree of agricultural mechanization. Only using traditional methods to optimize and adjust agriculture can no longer meet the needs of agricultural development. In view of environmental problems in the field of agriculture, Zhang and Zhi [4] proposed an environmental monitoring system of intelligent agricultural breeding base based on the Internet of Things by adopting information technology. The system used intelligent technology to capture relevant signals of agricultural environment. The obtained signals are analyzed and processed by means of analysis of the Internet of Things so as to obtain the corresponding environmental levels and indicators. Finally, specific indicators such as temperature and humidity of agricultural bases are adjusted by using different schemes based on different indicators. This model has been well applied in a variety of complex environments. The successful application of this model can accumulate many valuable experiences and theories for the Internet of Things in agriculture. In terms of intelligent agriculture, Tahtawi et al. [5] proposed a portable wireless node pair of intelligent agriculture system based on the Internet of Things. By using this technology, agricultural parameters can be controlled and monitored so that intelligence can better serve agricultural development. The model will extract the relevant data for intelligent simulation analysis; on the one hand, the model data can be modified and optimized; on the other hand, the model can be verified. Optical fiber sensor is an important part of signal sensor. In order to better optimize the application of different sensors in different categories, Qu et al. [6] proposed a distance compensation model based on the Internet of Things. The model analyzes important factors such as different fiber length, fiber propagation speed, and fiber distribution characteristics by using the method of time difference. In order to better verify the accuracy of the model, different data are classified and analyzed by simulation design, and the accuracy of the model is verified by relevant application results, thus providing support for the application of the Internet of Things in the field of optical fiber sensors. As a new power grid mode, smart grid can overcome the related problems existing in the traditional power grid, but smart grid still has some shortcomings in power generation, transmission, and other aspects. Esenogho et al. [7] used Internet of Things simulation technology to study the problems existing in smart grid. In order to better realize numerical intelligent transportation, they combined cloud platform with the Internet of Things technology to derive the corresponding optimization model. Through the verification of the model, it can be shown that the model has great advantages in electricity transmission and other aspects. Related intelligent work is carried out through several steps, such as intelligent decision-making, security monitoring, and lossless transmission. This study provides relevant theories for discussing the application of the Internet of Things in the next generation smart grid.

Intelligent decision models based on the Internet of Things play an important role in different fields: for the problems existing in urban planning and decision-making process. Khediri et al. [8] proposed an intelligent decision support system based on the Internet of Things theory. The model adds an optimization algorithm on the basis of the original adaptive model so as to realize intelligent decision-making and planning. The optimization algorithm can provide accurate guidance for urban planners in urban projects. In order to verify the accuracy of the model, the superiority of the model was verified by using relevant cases. The development of electronic information drives the development of related industries, and many electronic products have ushered in the peak of development. However, the existing development mode fails to develop and deal with the electronic environment, resulting in many problems in electronic products. Razul [9] designed groups of users with the same interests based on the intelligent decision analysis method under the effect of the Internet of Things so as to develop the corresponding optimization system. The optimization system realizes the decision of the algorithm system by using the method of multidata fusion, which provides relevant guidance for the application of electronic products. In order to discuss the new application of the intelligent model in complex neutral production, based on the theoretical basis of the IoT cloud platform, De et al. [10] established a fuzzy model of adaptive algorithm. The model constructs new fuzzy number sets by proposing and optimizing various algorithms. The reliability of this method is proved by correlation analysis and verification so as to provide ideas for intelligent decision analysis and research.

In order to quantitatively analyze the changes of the Internet of Things, the output value of the Internet of Things in the past decade is drawn, as shown in Figure 1. As time goes by, the output value of the Internet of Things industry increases gradually, among which the value in 2021 is 880, an increase of about 8.6 times compared with 102 in 2011, indicating that the industry shows a strong growth trend. In order to further analyze the change relationship of the output value of the Internet of Things and draw the corresponding value growth curve, it can be seen from the curve that, from 2011 to 2017, except for 2015, the overall growth rate of the Internet of Things exceeded 18%, indicating that the value of the Internet of Things increased at a high rate at this stage, and the corresponding development prospect of the Internet of Things industry was relatively good. From 2018 to 2021, the overall growth rate remains at 5%–15%, and the corresponding growth rate is small, indicating that the output value of the Internet of Things in this stage is relatively stable and it also reflects from the side that the Internet of Things has entered a period of stable growth. In order to further improve the application of the Internet of Things industry in all aspects, especially in the field of

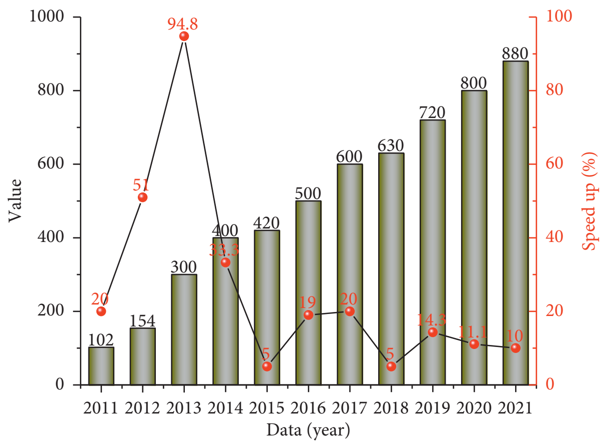

FIGURE 1: Bar chart of output value changes in IoT (2011–2021).

traditional Hanfu, it is necessary to adopt different optimization algorithms for structural adjustment of the Internet of Things industry and relevant industrial upgrading so as to maintain the rapid development of the Internet of Things industry.

The above studies mainly focus on the application of the Internet of Things in the fields of industry and agriculture, but the application of traditional Hanfu is relatively rare. Therefore, in order to explore the relevant applications of the Internet of Things in the field of traditional Hanfu, this paper adopts an intelligent decision model to carry out 3D simulation design and application of traditional Hanfu based on the relevant theories of the Internet of Things. By using relevant data to optimize the relevant parameters of the intelligent decision model, the model can more accurately describe the relevant characteristics of traditional Hanfu and verify the accuracy of the model through relevant tests. Finally, the model is used to predict the simulation design and application of traditional Hanfu, and the research results can provide support for the application of the Internet of Things in traditional Hanfu and other fields.

2. Basic Theoretical Analysis

2.1. Basic Theory of Internet of Things. In fact, the principle of Internet of Things technology is to construct an "Internet of Things" covering tens of thousands of buildings in the world by using RFID (Radio Frequency Identification), wireless data communication, and other technologies on the basis of computer Internet [11]. In this network, buildings can "communicate" with each other without human intervention. Its essence is to use radio frequency automatic identification technology to realize the automatic identification of objects and the interconnection and sharing of information through the computer Internet [12].

The Internet of Things industry has been integrated into every aspect of social life [13]: it can be mainly divided into comprehensive application field, management service field, network construction field, and induction recognition field [14]. (1) In terms of comprehensive application, the fields of comprehensive application can be mainly divided into service industry and manufacturing industry [15]. The service industry mainly includes software, information, finance, and security. The corresponding manufacturing industry mainly includes commerce, energy, and management. (2) Management services can be mainly divided into the extraction and integration of relevant supporting technologies and data information. (3) Network construction mainly includes two aspects: network layer convergence development and basic network construction. (4) Induction recognition is composed of data acquisition and analysis and transmission network. The concrete architecture of the Internet of Things network system is shown in Figure 2. It is worth explaining that the Internet of Things can be used to carry out layout and analysis of the relevant manufacturing industry so that the Internet of Things can be used to obtain optimal resource allocation and processing.

2.2. 3D Simulation Design. In view of the wide application of traditional Hanfu in modern society, advanced virtual simulation technology is applied in the product design and development stage under the background of huge demand, and an immersive display system is built to visually present the product model or process technology, so as to design [16], study, analyze, review, evaluate, and modify [17] Hanfu. The development and manufacturing of products are placed in the strict data environment constructed by computer technology, so the relevant concepts and systems of 3D simulation design need to be adopted [18]. 3D simulation design is mainly divided into data collection and overall, 3D entity model construction, interface analysis based on Internet of Things theory, and analysis of relevant simulation characteristics. Finally, relevant monitoring data and simulation results are obtained, as shown in Figure 3 for a detailed description.

Relevant studies show that using 3D simulation research can greatly reduce the cost and time of simulation design, further accelerate the decision-making progress in the process of design and optimization, also accelerate the planning cycle of product development and the whole project, and finally achieve the purpose of saving related costs and improving the technical content.

It is worth noting that, considering the material properties of porous media in Hanfu, 3D simulation design uses porous media materials to describe and analyze the design process. The overall equilibrium equation of porous media materials can be written as follows:

$$L^T \sigma + \rho g = \rho u + \rho_1 n S_1 \frac{D}{D_t}\left(\frac{w}{n S_1}\right), \quad (1)$$

where L is the differential algorithm; σ is the total stress tensor; g is the acceleration of gravity; u is the displacement of porous media; n is porosity; S_1 is saturation; ρ is the total density; ρ_1 is variable density; w is the relative velocity; D is the global damage variable; D_t is the local damage variable.

According to the generalized law, the matrix equilibrium equation in porous media materials can be written as

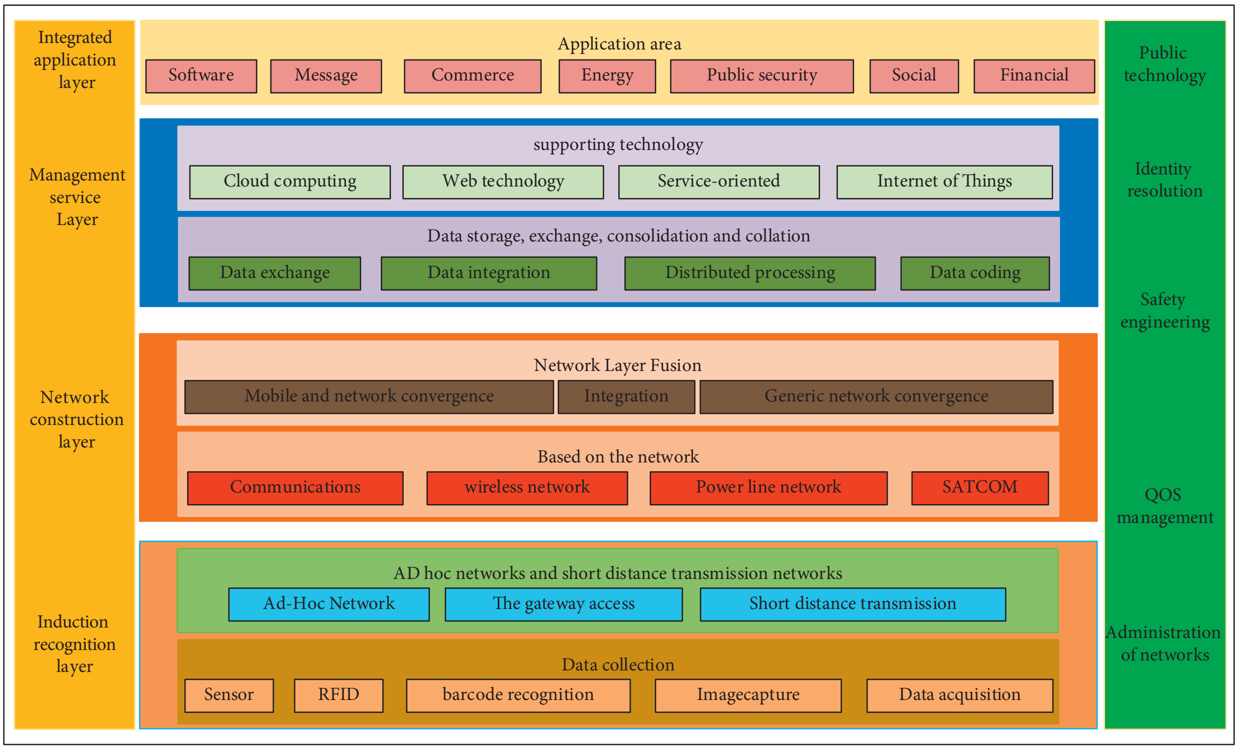

Figure 2: Internet of Things architecture diagram.

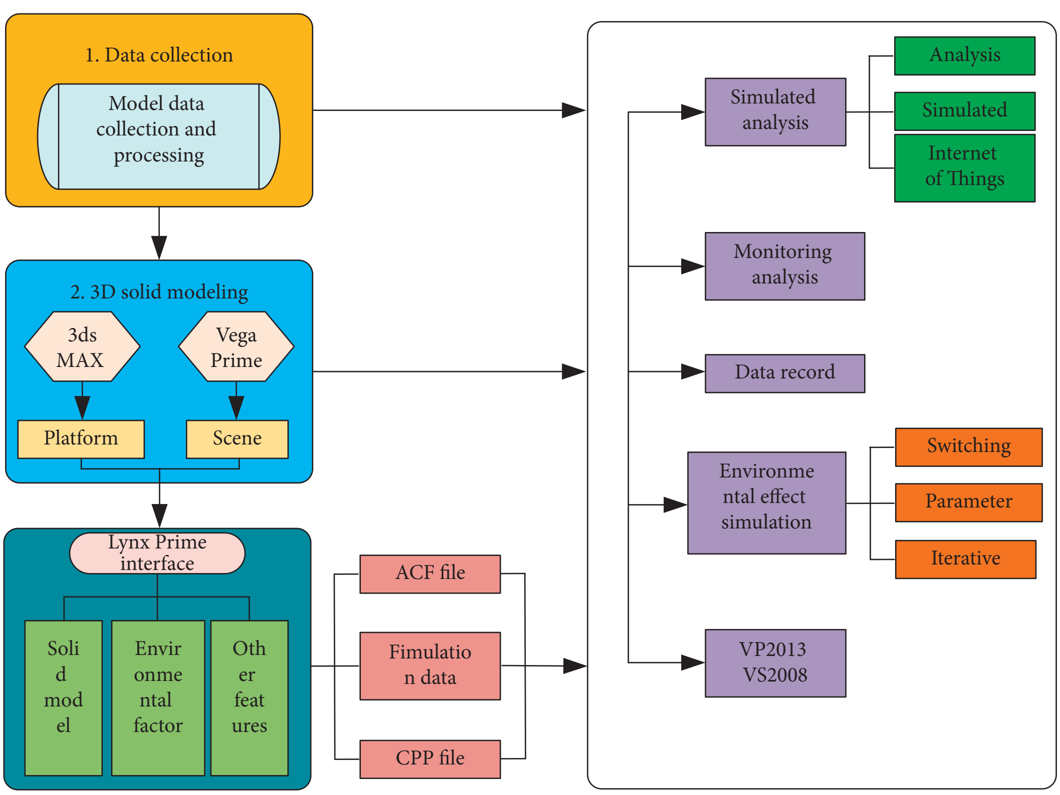

Figure 3: 3D view simulation framework.

$$k^{-1}w = -\nabla P_1 + \rho_1\left[g - u - \frac{D}{D_t}\left(\frac{w}{nS_1}\right)\right], \quad (2)$$

where P_1 is the compression pressure; ∇ is the gradient operator; k is the corresponding matrix.

According to the incremental theory, the differential form of effective stress is

$$d\sigma_e = D_T\left(d\varepsilon - d\varepsilon_p\right), \quad (3)$$

where σ_e is the effective stress, ε is the strain vector, and ε_p is the volumetric strain.

Thus, the corresponding Hanfu model expression can be obtained:

$$\sigma = \int D_T L_t du + \int \frac{mD_T dP_t}{3K_s} - mP_t, \quad (4)$$

where P_t is the total pressure of porous media; K_s is the volume modulus; L_t is a small strain differential algorithm.

By using the above equation, the relationship curves of different stresses with position changes in different 3D simulation analysis can be obtained, as shown in Figure 4, where the total stress is the sum of effective stress and pore pressure. With the change of position, different stress curves show a symmetrical change trend, and the symmetrical point is 0. Specifically, with the increase of position, the pore pressure shows a rapid increase at first, then keeps stable, and finally rapidly decreases; the overall change range of stress remains between 0 and 2.3. With the change of distance, the effective stress shows an opposite trend; that is, it drops rapidly first, then remains stable, and finally rises rapidly, corresponding to the change range of 1–2.5. Since the change trend of effective stress and pore pressure is opposite, except for the beginning and end, the total stress remains in a stable range, with the corresponding range of 2.5–3.5. The change range of total stress is the smallest, indicating that the change of position has the least influence on the total stress.

3D simulation in the design of different compression coefficient will affect the change of pore pressure and effective stress, then influence the change of the total stress range, in order to further clarify the compression coefficient influence on 3D simulation design by changing the value of compression coefficient to calculate the corresponding data, and get the related index change under different compression coefficient curve, as shown in Figure 5 (the compressibility factor is expressed as CC in the figure). With the increase of the compression coefficient, the corresponding index changes more greatly. When the compression coefficient is 1, the curve changes approximately linearly, and the corresponding change amplitude is small. When the compression coefficient is 2, the corresponding curve is divided into two parts: stable stage and increasing stage. When the compression coefficient continues to increase to 3, the curve shows an obvious stable stage after the increase stage, indicating that the number of iterations has an impact on the change of the compression coefficient. When the compression coefficient is 4 and 5, the curve can be clearly divided into low-level stage and high-level stage, and the critical value of the two stages appears when the number of iterations is 1500.

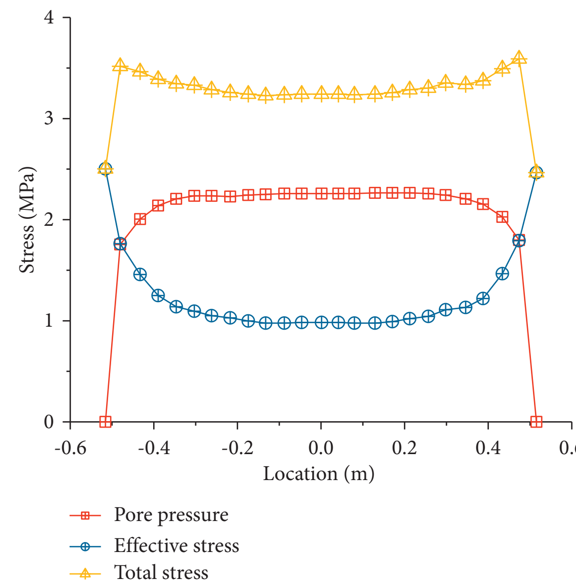

Figure 4: Stress change diagram.

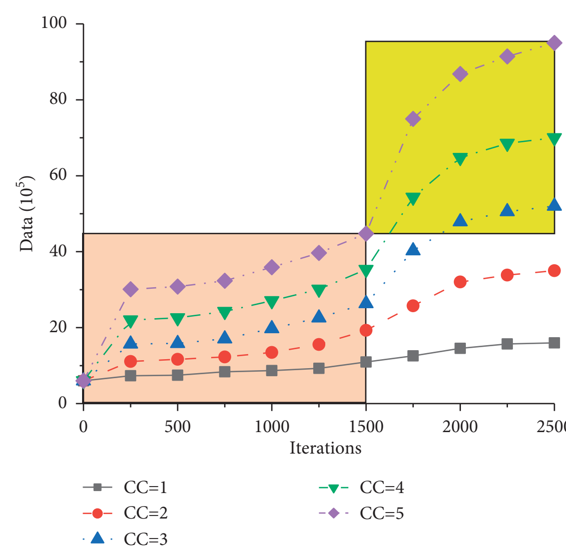

Figure 5: Exponential change diagram under different compression coefficient.

3. Decision Model Based on Multidata Fusion Algorithm

Traditional multisensor data fusion methods are characterized by low accuracy and high noise [19–21] because the data collected by sensors may be affected by noise and other factors, which may lead to unstable data fusion in the greenhouse environment. This paper proposes a multisensor data fusion algorithm [22, 23] based on adaptive trust estimation and neural network for the simulation design and application of multisensor distribution in traditional Chinese clothing of the Internet of Things.

3.1. Adaptive Trust Estimation Model. In view of the data uncertainty existing in the 3D simulation design of traditional Chinese clothing under the effect of the Internet of Things, the node trust model is introduced to calculate and analyze the trust relationship between data. This model can better analyze the relationship between the change of trust degree in time and space. The calculation of task degree is directly related to the acquisition time. Therefore, in n times of collection, the closer the collected data is to the current time, the greater the trust effect is and the greater the weight of trust calculation is. The further away from the current time, the smaller the weight of the data, which greatly improves the dynamic adaptability of the algorithm. First, define the trust function e_{ij}:

$$e_{ij} = f\left(\left|x_i - x_j\right|\right) \quad i, j = 1, 2, \ldots, n, \tag{5}$$

where x_i and x_j, respectively, represent the preprocessed data value of the i-th sensor node and the j-th sensor node at a certain time point t_0. E_{ij} ranges from 0 to 1. It can be seen that $e_{ij} = 0$ or 1 is two extreme values. When $e_{ij} = 1$, it represents the absolute trust of node i to node j. When $e_{ij} = 0$, it indicates that there is no trust between node i and a node in j.

The corresponding trust estimation function is

$$e_{ij} = \begin{cases} e^{-\left|x_i - x_j\right|}, & \left|x_i - x_j\right| < N \\ 0, & \left|x_i - x_j\right| \geq N, \end{cases} \tag{6}$$

where N is the preset threshold.

When data is collected for m times on relevant nodes, the average D_{ij} of the corresponding trust degree is

$$D_{ij} = \frac{1}{m} \sum e_{ij}. \tag{7}$$

This is because if the data of node i and node j need to be collected m times in a period of time, the trust degree of node i to node j is $R(i, j)$. In order to measure the relationship of trust, we need to use the mean value method to get the mean value of trust. However, this degree of trust has certain subjective factors and cannot achieve a good representation of the Internet of Things. After the establishment of the adaptive trust estimation model, the trust threshold is set as the trust value between sensor data nodes. Before the optimization of the original data, abnormal sensor detection is carried out through the model. If the trust degree of a sensor node is higher than the trust threshold, the sensor node is judged to be in normal working state. If a sensor node is lower than the trust threshold for a long time, the sensor node is judged to be in a faulty state so as to realize the abnormal detection function of the shed sensor. Therefore, in order to study the analysis of relevant factors under the effect of the Internet of Things, the concept of time wheel is adopted, with time m as the interval unit, and attenuation factor ω is introduced to correct the error of the original model, so as to obtain the optimized degree of trust:

$$d_{\mathrm{ij}} = \left\{ \sum_{n-m+1}^{n} \omega e_{\mathrm{ij}}, \quad n \geq m \sum_{1}^{n} \omega e_{\mathrm{ij}}, \quad n < m \right. \tag{8}$$

In order to compare and analyze the changing relationship between the original trust and the optimized trust, the curves of the changes of the two original trust and the optimized trust with the number of iterations are drawn, as shown in Figure 6. As the number of iterations increases, the corresponding curves of the two original trust degrees change little, indicating that only changing the relevant parameters of the original model cannot improve the relevant content of trust degree. The curve of the original trust degree is mainly divided into the stage of slow rise and the stage of steady increase. The change range of the two original trust degrees is as follows: the change range of trust degree D_{ij}-1 is about 177, and that of trust degree D_{ij}-2 is about 310.6. After optimization, the change in trust was about 300. The change trend of the original trust degree is basically the same as that of the optimized trust degree, indicating that the introduction of time parameter can better control the change trend of the trust degree. The difference between the peak line of optimized trust and the original D_{ij}-2 peak line of trust was marked as h_1, and the difference between the peak line of optimized trust and the original D_{ij}-1 peak line of trust was marked as h_2. It can be seen from the marks in the figure that the optimization model has a significant impact on willingness trust, both showing varying degrees of increase.

The model fully considers the influence of time on trust. In this way, not only can the trust degree between sensors be calculated more accurately, but also the influence of inaccurate data value caused by too long measurement time is avoided to the greatest extent, which is more practical. To sum up, the trust estimation matrix D is

$$D = \begin{bmatrix} d_{11} d_{12} \cdots d_{1n} \\ d_{21} d_{22} \cdots d_{2n} \\ \vdots \ \vdots \ \vdots \\ d_{n1} d_{n2} \cdots d_{nn} \end{bmatrix}. \tag{9}$$

3.2. Intelligent Decision Model. It can be seen from the above analysis that the adaptive trust model can achieve good application of the Internet of Things and introduce time-related parameters to optimize the trust degree [24, 25]. The relevant intelligent decision model is shown in Figure 7. By using the method of confidence estimation, the corresponding average calculation data is obtained. On this basis, the corresponding strengthening average probability is calculated so as to generate the corresponding decision information. Traditional 3D simulation design and research of Hanfu is a complex control object with nonlinear, uncertain, and time-varying characteristics, so it is difficult to establish an accurate mathematical model. In practice, it is inevitable to deal with uncertainty, and traditional manual

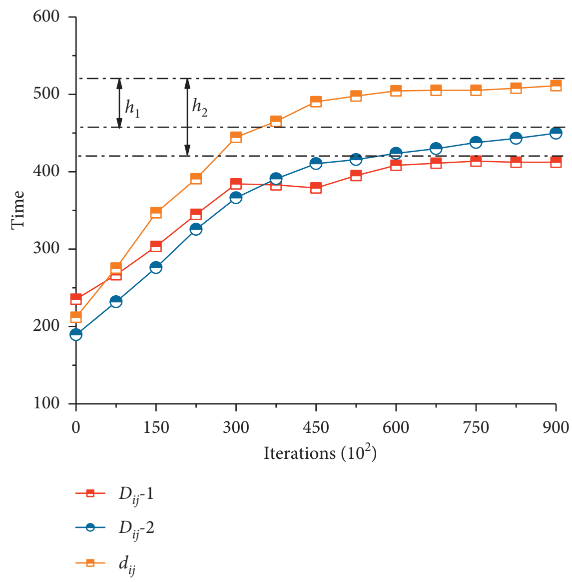

Figure 6: Comparative analysis of trust.

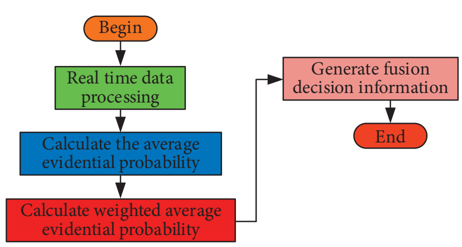

Figure 7: Flowchart of intelligent decision model.

operation will adversely affect the accuracy of data. The conventional setting of upper and lower thresholds has high energy consumption, poor system stability, and lack of effective feedback mechanism and long-term evaluation. Therefore, this paper chooses the method based on evidence theory and adopts the intelligent decision model to analyze, make decisions, and regulate the parameters of Hanfu.

The corresponding mass function of this model is shown as follows:

$$m(\varnothing) = 0, \sum_{A\subseteq\Theta} m(A) = 1. \tag{10}$$

The combination rules of this model are as follows:

$$m(A) = \begin{cases} 0, & A = \varnothing \\ K^{1} \sum_{\cap A_j=\Theta} \prod_{i=1}^{n} m_i(A_j), & \end{cases} \tag{11}$$

where K is the conflict factor, $K = 1 - \sum_{\cap A_j=\Theta} \prod_{i=1}^{n} m_i(A_j)$.

It is worth explaining that, in the case of high conflict, the result of the iterative fusion is inefficient. In this paper, the evidence theory, which improves the evidence source based on the traditional basic algorithm, is adopted to revise the evidence with high conflict and then use the combination rule to conduct iterative fusion. The specific calculation steps are as follows:

(1) Calculate the average evidence probability $m_{ave}(A)$ and the distance d_i between each evidence and the average evidence under a single proposition.

$$m_{\text{ave}}(A) = \frac{1}{n}\sum_{i=1}^{n}(A), \quad d_i = \left|m_i(A) - m_{\text{ave}}(A)\right|, \quad i = 1, 2, \ldots, n. \tag{12}$$

(2) Define probability weight ω_i:

$$\omega_i = \frac{1/d_i}{\left[\sum_{i=1}^{n}(1/d_i)\right]}, \quad m_{\text{ave}}(A) = \sum_{i=1}^{n}\omega_i m_i(A). \tag{13}$$

(3) Solve other average distances:

$$d_l = \left[m_l(A) - m_{\text{ave}}(A)\right]^2 + \left[m_l(B) - m_{\text{ave}}(B)\right]^2 + \cdots + \left[m_l(D) - m_{\text{ave}}(D)\right]^2 \quad l = 1, 2, \ldots n. \tag{14}$$

(4) Define the weight of each evidence ω_l, and work out the average evidence probability m_ω:

$$\omega_l = \frac{1/d_l}{\left[\sum_{i=1}^{n}(1/d_i)\right]}, \quad m_\omega = \sum_{l=1}^{n}\omega_l m_l. \tag{15}$$

(5) The final fusion result is obtained after iterative combination of m_ω for $n-1$ times by applying the basic composition rules of the model.

It can be seen from the above studies that the monitoring distances obtained under different combination rules are different, indicating that different rules will have different influences on the simulation results. In order to quantitatively analyze the influence of monitoring distance on the model, the relationship between the index smoothness index of monitoring distance and the corresponding distance of the model was summarized and analyzed so as to obtain the distance change curves of the model under different smoothness indexes, as shown in Figure 8. With the increase of time, the change of the test data shows a trend of fluctuation, indicating that the stability of the test data is poor, which needs to be described by nonlinear method. Although the change curves of smoothing indexes m (A) and m (B) also show fluctuations, the corresponding amplitude and frequency are far from the experimental data, indicating that the description of these two indices is poor. It can be seen from the data description by using the smoothing index m (C) that the overall change trend is basically consistent with the experimental data, indicating that the fitting characteristics are higher than the smoothing indexes m (A) and m (B). The intelligent decision model will produce different average evidence probabilities and corresponding probability weights according to the different calculation contents so that the corresponding average distance will show inconsistent phenomenon and finally lead to the fact that the corresponding smoothness index will show different changing trends with different time.

4. Traditional Hanfu Design Based on Internet of Things

4.1. Traditional Hanfu. Traditional Chinese clothing is affected by various factors in its development. With the

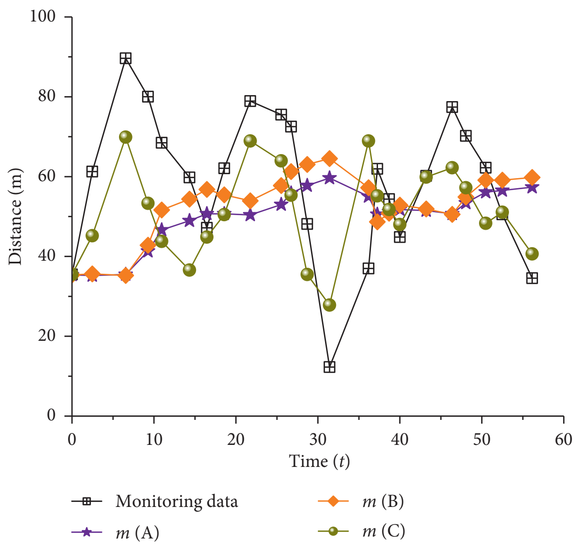

Figure 8: Model distance change diagram under different smoothing indices.

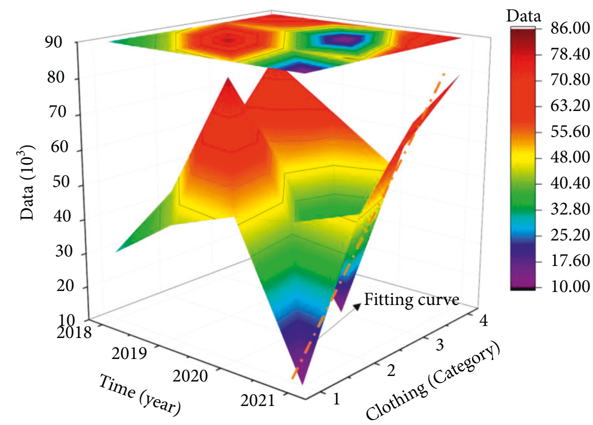

Figure 9: Summary of clothing consumption by category (2018–2021).

development of computer technology, digital image processing [26, 27], artificial intelligence [28], and other technologies are gradually becoming mature, providing new opportunities for the preservation and research and development of traditional clothing. The digitalization of traditional clothing is an inevitable trend of inheritance and development. In the context of the digital era, new technologies such as 3D scanning [29], VR virtual display, AR augmented reality, and mixed reality [30] have also been developed. Under the background of increasing demand for traditional garment industrialization and informatization, the Internet of Things theory is adopted to carry out 3D simulation design and application of traditional Hanfu.

In order to better study the impact of Internet of Things technology on traditional Hanfu, the consumption change chart of all kinds of consumer clothing in the past three years was obtained through investigation and analysis, as shown in Figure 9. It is worth noting that, in the category of clothing, 1 is casual wear; 2 represents professional wear; 3 is fashion; 4 represents traditional Hanfu.

In Figure 9, you can see that different dress as the change of time shows different trends, and the clothing market is not static, but with different changes according to the needs of the era, the explanation of this also needs to adopt the relevant theoretical analysis of the apparel market changes so as to better guide the development of traditional dress. In order to better analyze the changes among different clothes, statistics and analysis are carried out on the events related to Hanfu in the context of the Internet of Things, so as to provide relevant support for the research on the Internet of Things in traditional Hanfu. The relevant statistical results are shown in Table 1. Hanfu events can be divided into offline Hanfu events and online Hanfu events. Among offline Hanfu events, there were 36 activities, while there were only 10 reports related to Hanfu. Online Hanfu communication is the most, accounting for 25.9%, while the content related to Hanfu emotion only accounts for 4.4%.

4.2. Model Analysis and Prediction. Through the above analysis, it can be seen that there are certain problems in the design and application of the existing traditional Hanfu. In order to better solve and analyze this problem, based on the Internet of Things theory, intelligent decision analysis model in 3D simulation analysis algorithm is adopted to study the design and application of traditional Hanfu. The corresponding device identification process of the Internet of Things is shown in Figure 10. The Internet of Things identification framework can be divided into four sections: data identification and extraction, data marking and analysis, training and monitoring of corresponding models, and evaluation of corresponding results.

Intelligent decision algorithms based on the Internet of Things can be divided into three kinds according to their validity principle: mathematical estimation, victory estimation, and critical decision. According to the robustness, it can be divided into data method and objective function method. In order to better analyze the accuracy of data, five different methods are analyzed to evaluate the performance of these optimization algorithms. The relevant evaluation results are shown in Figure 11.

As can be seen from Figure 11, with the increase of the number of times, the change of test data shows a steady increase at first, then a slow increase, and finally a rapid increase. Different calculation methods have different descriptions of the test data. The mathematical estimation method shows an approximate linear trend of change. This method can describe the linear stage better, but it cannot better represent the nonlinear change of the data. The result estimation method is the change of quadratic function, which tends to describe the change form between linear change and nonlinear change. The key decision method has typical piecewise properties, including linear increase stage, stable stage, and quadratic linear increase stage, and can only be used to describe the data with piecewise properties. The data method has strong fluctuation in the early stage and cannot do well in the characterization of the data with strong stability. Since the objective function method takes into account the Internet of Things theory and simulation analysis method, it can better describe the relevant

Table 1: Analysis table of related Hanfu events under the effect of Internet of Things.

Number	I	II	Amount	Ratio (%)
1	Offline Hanfu	Hanfu activities	36	10.5
2		Hanfu event	25	7.3
3		Hanfu photography	17	4.9
4		Hanfu reported	10	2.9
5		Hanfu show	46	13.4
6	Offline Hanfu	Hanfu communication	89	25.9
7		Hanfu emotion	15	4.4
8		Basic communication of Hanfu	46	13.4
9		Professional knowledge of Hanfu	35	10.2
10		Hanfu video	25	7.3

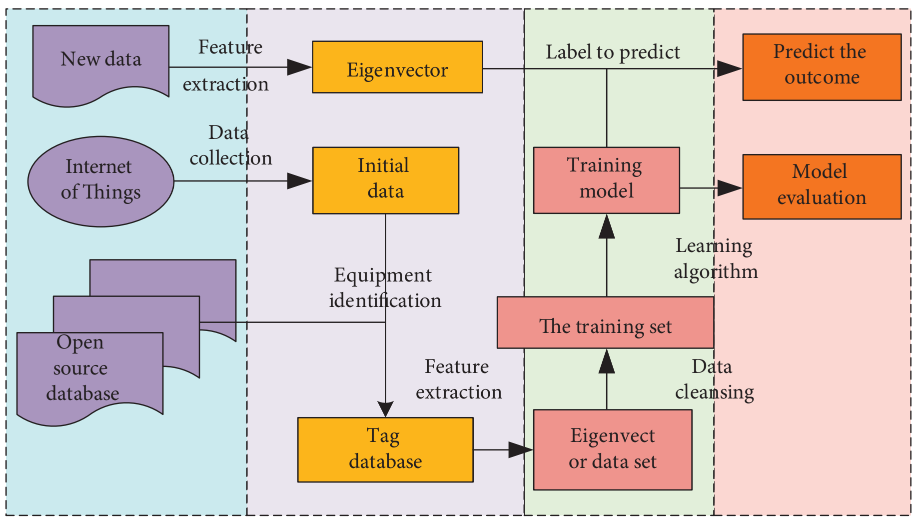

Figure 10: Internet of Things device identification framework diagram.

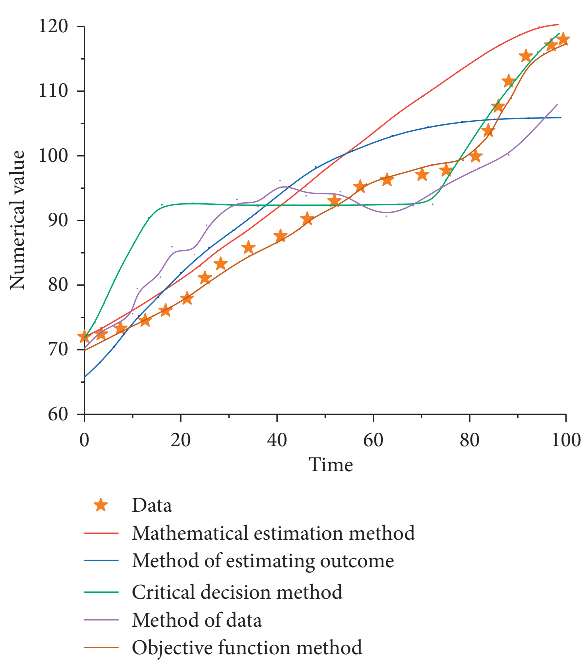

Figure 11: Comparative analysis of Hanfu by different methods.

characteristics of traditional Hanfu, which is also verified by the experimental results.

In order to better analyze the application of 3D simulation design in the field of traditional Hanfu, the intelligent decision analysis model under the effect of the Internet of Things is adopted to predict and analyze the design and application prospect of traditional Hanfu at different times. The relevant calculation results are shown in Figure 12. With the increase of time, the prospect of traditional Hanfu in the application field shows a gradual increasing trend and shows a good linear correlation in designs 1, 2, and 3, while in design 4, the application shows a change of increasing fluctuation. The results indicate that designs 1, 2, and 3 have obvious linear characteristics, while corresponding design 4 is affected by multiple factors and is weak in linear characteristics of single factor. From the perspective of the design field, the application prospect of design 1 is not good, while the design prospect of corresponding designs 2, 3, and 4 is relatively clear, indicating that different design fields also show different changes in the relevant algorithm model. The model can better describe and characterize the main characteristics of traditional Hanfu, but for some simulation characteristics of Hanfu, it cannot be a better description; this is mainly

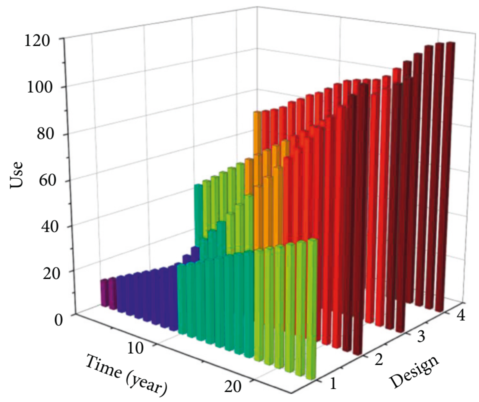

Figure 12: Design and application of predictive graphs.

because the intelligent decision model to the principle of simplicity only considers when building the traditional Hanfu in simulation in the design of the main feature of but for other secondary features without fully considering the model. Finally, the model is biased.

5. Conclusion

(1) With the change of stress position, different stress curves show a trend of symmetry. At the point where the symmetry point is 0, with the increase of the position, pore pressure shows a trend of rapid rise first, then remains stable, and finally rapidly declines. Effective stress shows an opposite trend. The change range of the total stress is the smallest, indicating that the change of position has the least influence on the total stress.

(2) The value changes under different compressibility coefficients are different. With the increase of the compressibility coefficient, the corresponding index changes more. When the compressibility coefficient is 4 and 5, the curve can be clearly divided into low-level stage and high-level stage. And the critical value of the two stages appears when the number of iterations is 1500.

(3) With the increase of time, the change of the test data shows a trend of fluctuation, indicating that the stability of the test data is poor and the smooth indexes m (A) and m (B) can describe the change curve poorly, while the smooth index m (C) can describe the overall change trend and the test data better.

Data Availability

The data used to support the findings of this study are available from the author upon request.

Conflicts of Interest

The author declares that there are no conflicts of interests or personal relationships that could have appeared to influence the work reported in this paper.

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References

[1] A. Sharma, S. Kaur, and M. Singh, “A comprehensive review on blockchain and Internet of Things in healthcare[J],” *Transactions on Emerging Telecommunications Technologies*, vol. 32, no. 10, pp. 53–72, 2021.

[2] C. Guo, S. Su, and K. Choo, “A provably secure and efficient range query scheme for outsourced encrypted uncertain data from cloud-based internet of things systems[J],” *IEEE Internet of Things Journal*, vol. 10, no. 99, pp. 1–15, 2021.

[3] D. Wei, H. Ning, F. Shi et al., “Dataflow management in the internet of things: sensing, control, and security,” *Tsinghua Science and Technology*, vol. 26, no. 6, pp. 918–930, 2021.

[4] X. Zhang and Y. Zhi, “Design of environment monitoring system for intelligent breeding base based on internet of things[J],” *Open Access Library Journal*, vol. 8, no. 10, pp. 9–19, 2021.

[5] A. Tahtawi, E. Andika, and W. N. Harjanto, “Portable wireless node design for smart agricultural system based on Internet of Things[J],” *IAES International Journal of Robotics and Automation*, vol. 10, no. 1, pp. 100–115, 2021.

[6] S. Qu, Z. Wang, Z. Qin, Y. Xu, and Z. Liu, “Internet of things infrastructure based on fast, high spatial resolution and wide measurement range distributed optic-fiber sensors[J],” *IEEE Internet of Things Journal*, vol. 148, no. 99, pp. 201–216, 2021.

[7] E. Esenogho, K. D. Djouani, and A. Kurien, “Integrating artificial intelligence internet of things and 5g for next-generation smart grid: a survey of trends challenges and prospect [J],” *IEEE Access*, vol. 16, no. 8, pp. 769–786, 2022.

[8] A. Khediri, M. R. Laouar, and S. B. Eom, “Improving intelligent decision making in urban planning,” *International Journal of Business Analytics*, vol. 8, no. 3, pp. 40–58, 2021.

[9] M. H. Razul, “Adaptive E-Leering with intelligent decision for group suggestion[J],” *Turkish Journal of Computer and Mathematics Education*, vol. 12, no. 4, pp. 890–897, 2021.

[10] S. K. De, B. Roy, and K. Bhattacharya, “Solving an EPQ model with doubt fuzzy set: a robust intelligent decision-making approach,” *Knowledge-Based Systems*, vol. 235, no. 15, p. 107666, 2022.

[11] A. Abed, “Controlling and monitoring the performance of a robotic arm using Internet of Things (IoT)[J],” *International Journal of Computer Application*, vol. 174, no. 26, pp. 7–13, 2021.

[12] K. Balaji and M. S. Sakthivel, “Framework for health management and recording for sailors using Internet of Things (IoT) in underwater communication[J],” *International Journal for Multiscale Computational Engineering*, vol. 19, no. 1, pp. 435–446, 2021.

[13] X. Deng, “Multiconstraint fuzzy prediction analysis improved the algorithm in internet of things,” *Wireless Communications and Mobile Computing*, vol. 2021, no. 5, pp. 1–7, 2021.

[14] J. E. Juhi and R. R. Dr, “Implementation of ABMS with cuk converter for enhanced battery life using Internet of Things

[J]," *International Journal for Modern Trends in Science and Technology*, vol. 7, no. 5, pp. 107–111, 2021.
[15] A. Nazir, "An ontology based approach for context-aware security in the internet of things (IoT)," *International Journal of Wireless and Microwave Technologies*, vol. 11, no. 1, pp. 28–46, 2021.
[16] S. Shah, "Mitigating malicious insider attacks in the internet of things using supervised machine learning techniques[J]," *Scalable Computing: Practice and Experience*, vol. 22, no. 16, pp. 358–369, 2021.
[17] D. Wei, N. Xi, J. Ma, and L. He, "UAV-assisted privacy-preserving online computation offloading for internet of things," *Remote Sensing*, vol. 13, no. 23, p. 4853, 2021.
[18] D. Zhang and X. Zhang, "Rehabilitation brace based on the Internet of Things 3D printing technology in the treatment and repair of joint trauma[J]," *Journal of Healthcare Engineering*, vol. 78, no. 25, pp. 439–457, 2021.
[19] H. Dong, F. Wang, D. He, and Y. Liu, "The intelligent decision-making of copper flotation backbone process based on CK-XGBoost," *Knowledge-Based Systems*, vol. 243, no. 15, p. 108429, 2022.
[20] B. Hamrouni, A. Bourouis, A. Korichi, and M. Brahmi, "Explainable ontology-based intelligent decision support system for business model design and sustainability[J]," *Sustainability*, vol. 13, no. 17, pp. 468–487, 2021.
[21] C. Han, T. Ma, and S. Chen, "Asphalt pavement maintenance plans intelligent decision model based on reinforcement learning algorithm," *Construction and Building Materials*, vol. 299, no. 10, p. 124278, 2021.
[22] Y. Luo, J. Dai, and H. Li, "Research on intelligent decision based on compound traffic field," *International Journal of Automotive Technology*, vol. 22, no. 4, pp. 1023–1034, 2021.
[23] J. Ma, "Intelligent decision system of higher educational resource data under artificial intelligence technology," *International Journal of Emerging Technologies in Learning (iJET)*, vol. 16, no. 05, p. 130, 2021.
[24] Q. Mahdi, A. Shyshatskyi, Y. Prokopenko et al., "Development of estimation and forecasting method in intelligent decision support systems," *Eastern-European Journal of Enterprise Technologies*, vol. 3, no. 9(111), pp. 51–62, 2021.
[25] M. Sharma and M. Biswas, "A Deep learning-based intelligent decision support system for hyperspectral image classification using manifold batch structure in Internet of Things (IoT)[J]," *Wireless Personal Communications*, vol. 186, no. 26, pp. 4638–4675, 2021.
[26] T. Sun, Z. Gao, Z. Chang, and K. Zhao, "Brain-like intelligent decision-making based on basal ganglia and its application in automatic car-following," *Journal of Bionics Engineering*, vol. 18, no. 6, pp. 1439–1451, 2021.
[27] X. Wang, "Application of 3D-HEVC fast coding by Internet of Things data in intelligent decision," *The Journal of Supercomputing*, vol. 78, no. 5, pp. 7489–7508, 2022.
[28] S. Yang, Z. Xu, and J. Wang, "Intelligent decision-making of scheduling for dynamic permutation flowshop via deep reinforcement learning," *Sensors*, vol. 21, no. 3, p. 1019, 2021.
[29] Ke. Zong, Y. Yuan, C. E. Montenegro-Marin, and S. N. Kadry, "Or-based intelligent decision support system for E-commerce," *Journal of Theoretical and Applied Electronic Commerce Research*, vol. 16, no. 4, pp. 1150–1164, 2021.
[30] X. Zhao, J. Wu, M. Wang, G. Li, H. Yu, and W. Feng, "Multi-sensor data fusion algorithm based on adaptive trust estimation and neural network [C]," in *2020 IEEE/CIC International Conference on Communications in China (ICCC)*, pp. 582–587, Chongqing, China, 09-11 August 2020.