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Digital Engraving and Art Design Analysis Based on Spatial Expression Techniques

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Abstract

Aiming at the problems of poor transmission effect and serious data loss in digital engraving, this paper puts forward a digital modeling model from the perspective of spatial expression. First, in-depth analysis of the original digital art design can not solve the problem of digital carving accuracy, and analysis of the reasons for the poor calculation accuracy of digital carving. Using wireless network technology and WIFI technology to obtain digital information of digital engraving, through the Internet design scheme statistics, according to the digital features to judge the form and result of engraving, remove irrelevant spatial information. Then, according to the Internet data monitoring, the change rate and engraving method of the engraving data are calculated, and compared with the actual engraving requirements, the parameters and indicators of digital art design are adjusted. MATLAB simulation test analysis shows that in the case of wireless communication and Internet monitoring, the digital engraving model of spatial expression technique can improve the accuracy of artistic design, and the accuracy rate is greater than the actual design requirements. According to the design requirements of different wireless networks and network communications, the time and compliance rate of digital engraving can meet the needs of artistic design.

Keywords: Wireless Network, Spatial Representation, Digital Engraving, Art Design

1. Introduction

The extensive use of wireless networks, network security and other methods has greatly improved the efficiency of digital art design, but there are problems of inaccurate art design content and design methods, and verification affects the development of art design [1]. How to effectively use wireless network technology to improve the level of art and design is the focus of attention in computing, wireless communication and art design [2]. The survey results show that the application rate of wireless network technology in art design [3], digital engraving, etc. was 25% in 2010, andi ncreased to 65.3% in 2022. This value showed an upward trend, indicating that the application of wireless network technology in digital engraving is relatively deep [4]. Wireless network technology

engraving data transmission through IP/TCP protocol, which is susceptible to interference and attack during transmission, and the transmission effect is poor, resulting in serious loss of design solutions. Based on this, this paper proposes a digital engraving model based on spatial expression method, which simplifies the transmission of digital engraving data, encrypts the transmission, and performs key feedback to realize the complete transmission of digital engraving data, and the specific transmission process is shown in Figure 1.

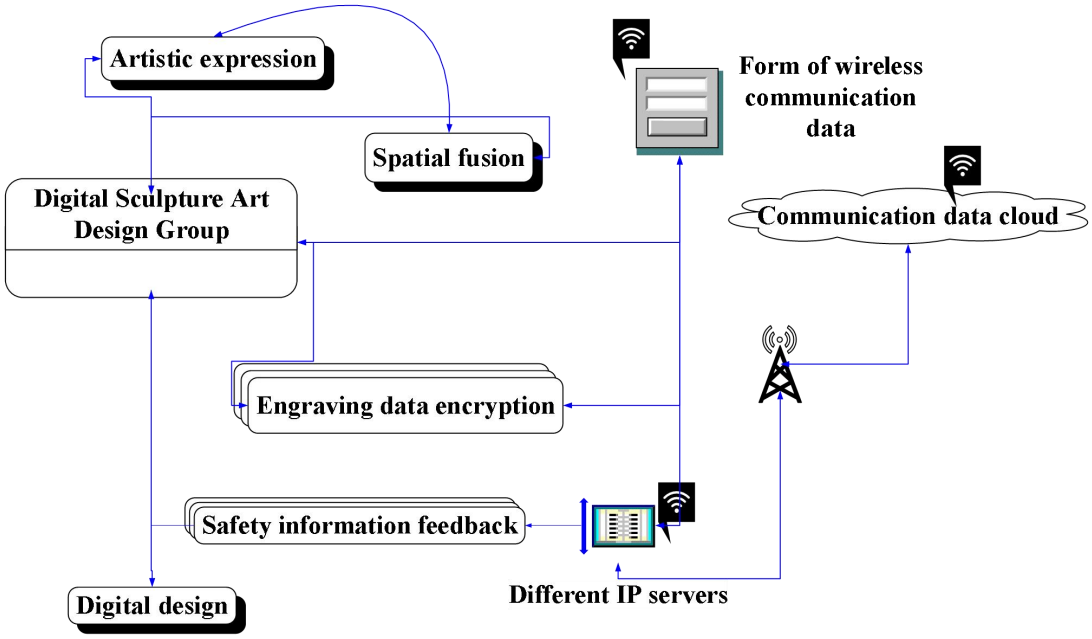

Figure 1. Transmission of Digital Engraving Data in a Wireless Network

2. Related Concepts

2.1 Advantages of Wireless Networks

Wireless network has the advantages of fast transmission and sea quantification, and can realize the rapid transmission of engraved content, art design, and Combined with the decision tree algorithm, the design data is simplified and integrated to achieve the effective dissemination of spatial information [5]. At the same time, the validity of the communication is deeply excavated to verify the engraved content, keys, and integrity of the information that has been transmitted. Some scholars combine the wireless transmission method with the intelligent one, apply it to the engraving digital analysis, and try adjusting the design parameters [6].

2.2 Interleaving and Mapping

The results show that this method can improve the speed of digital engraving data transmission, but there is a problem of design data loss during transmission, and the loss rate is about 28.7%. The application of wireless transmission and intelligent algorithms to digital sculpting requires the integration of spatial expression techniques to complete the optimization of digital art design, as shown in Table 1.

Table 1. Data Transmission Forms of Digital Engraving by Different Methods

Method of Presentation	Optimize Content	Remark
WIF technology (D. R. Collier, 5G network transmission)	The transmission speed of digital engraving	Strong interference
WIFI, spatial expression (S. S. Singh, Three-dimensional spatial structure)	The amount of data for art design, transmission speed, design content	Large amount of data

WIFI, spatial expression methods, statistical methods (E. Sugiarto, Ultra-wideband transmission)	Data volume, transmission speed, design content, data integrity of art design	Less intrusive
WIFI, spatial expression, intelligent method (G. Giannakak, Spatial color setting)	WIFI, spatial expression techniques, statistical methods, single transmission data volume, artistic design effects	Strong data integrity
Spatial expression, intelligent methods (E. Veloz Arce, Spatial Layout Settings)	Digital design data structures	The data structure is complete
Smart approach (M. Engler, ant colony, mountain climbing algorithm etc)	Data structure	Data correlation, integrity
WIFI, smart method (N. Safinatul Hasanah Harahap, 5G network, Bayesian algorithm)	Amount of data transferred	Poor data transmission speed and integrity

It can be seen from the content in Table 1 that in the case of clarifying spatial information, engraving content, and engraving form, it is necessary to use different methods to improve the transmission effect of digital engraving and the efficiency of digital design. At the same time, it is necessary to combine the form of digital design and select different wireless transmission results [7].

2.3 Development of Spatial Expression Technology

Compared with the design results of other methods, compare the characteristics of different transmission methods, optimization methods, and the focus of transmission, etc., and quantify the engraving content and engraving form according to the above situation to improve the transmission effect of artistic design. However, when digital engraving data is transmitted, it is greatly affected by external interference and spatial factors, and the rapid transmission of spatial information cannot be realized [8]. Moreover, the complexity of the engraving design is high, there are many feature points involved, and the wireless transmission method cannot simplify the design data and non-structural data and needs to be integrated with intelligent algorithms. 3) Integration with other display methods, such as spatial methods, color methods [9], digital methods, etc., to achieve the quantification of engraving content, simplify massive data, improve the accuracy and rationality of wireless transmission, and improve the effectiveness of digital art design. Although the previous wireless transmission method can preliminarily screen the digital art design data, the overall transmission effect is not ideal, and it cannot realize the judgment of massive and complex art data, resulting in transmission delay, reduced integrity, and garbled transmission. Based on the above analysis, this paper integrates spatial expression techniques with intelligent algorithms to optimize the spatial layout and spatial structure of engraving digital art design and forms an effective wireless transmission set to complete the effective transmission of art design and improve transmission accuracy [10].

3. Methodology

3.1 Wireless Encryption of Digital Engraving Data

The spatial representation method can simplify the sculpting content, while the decision tree algorithm transmits data wirelessly, sculpting art design data, sculpting data, and mapping through data analyze the correlation, transmission rate, and security of different data [11]. The combination of spatial representation and decision tree method can filter out key engraved digital values from massive transmitted data and construct a preliminary collection of network data. The spatial representation method can transmit design data, sculpting data, and WIFI Hacker attack data is simplified, and data classes for engraving content and design solutions are built.

3.2 Mathematical Methods of Spatial Expression Technology

In order to analyze more accurately, referring to the previous artificial intelligence algorithms, combined with wireless transmission content and spatial planning content, the following assumptions are put forward to quantify the spatial design data. The data in the wireless transmission is filtered, the network environment and the constraints are constructed, and the results are as follows.

Collection of digital engraving data: engraving content is x_{ij}, art scheme is y_{ij}, network security factor is k, WIFI transmission function is $uchar(x_i \cdot x_j)$, the Bluetooth encryption coefficient is ζ_{ii}, and the transmission of digital engraving data is shown in Equation (1).

$$uchar(k) = \sum x_{ij} \cdot k \cdot y_{ij} \left| \zeta_{ii} \right. \tag{1}$$

The code is written as follows:

```
While{uchar flag;
uchar x = 0x01;
while{uchar bdata sta}
do{sbit  x = sta^6;
sbit  k = sta^5;
sbit  y = sta^4;
sbit key=x^0;
sbit wela=y^6;
sbit dula=k^7;}}
```

Spatial expression method: The function of spatial expression technique is $f(x)$, the characteristics of art design is $tz(x \cdot k)$, the implementation coefficient of 5G network is κ_{ii}, and the expression method of spatial information data is shown in Equation (2).

$$f(x) = tz(x \cdot k)_i \cdot \kappa_{ii} \tag{2}$$

The specific code-writing process is as follows:

```
While{void init_io(void)
{
 Do{ x = 0;
   k = 1;
   κii = 0;
y = 1;
   f(x) = tz(x·k)i · κii
   } }}
```

Data extraction of decision tree: The amount of data transmitted by WIF is $\sum x_{it}$, the decision tree function is $tree(x)$, the data fusion degree judgment function is $ru(x)$, and the refining process of the decision tree is shown in Equation (3).

$$tree(y_{ij}, f(x)) = \frac{\zeta_{ii} \cdot [k \cup ru(x \to y)]}{2 \cdot k} \tag{3}$$

The data extraction process is as follows:

```
void delay_ms(uchar x)
```

```
{
   uchar i, j;
   i = 0;
   for(i=0; i<x; i++)
   {
     j = 250;
     while(--j);
     j = 250;
     while(--j);
   }
}
```

3.3 Association of Wireless Networks for Digital Sculpting Design

There is a certain correlation between spatial information data and the engraving form and engraving content show cross-changes, so it is necessary to simplify the design data and determine the key engraving digital values and the correlation of key data. In addition, the interference factors affect the validity calculation results of spatial information, so the correlation of the engraving data is calculated to realize the correlation analysis of the design data. The specific process is shown in Figure 2.

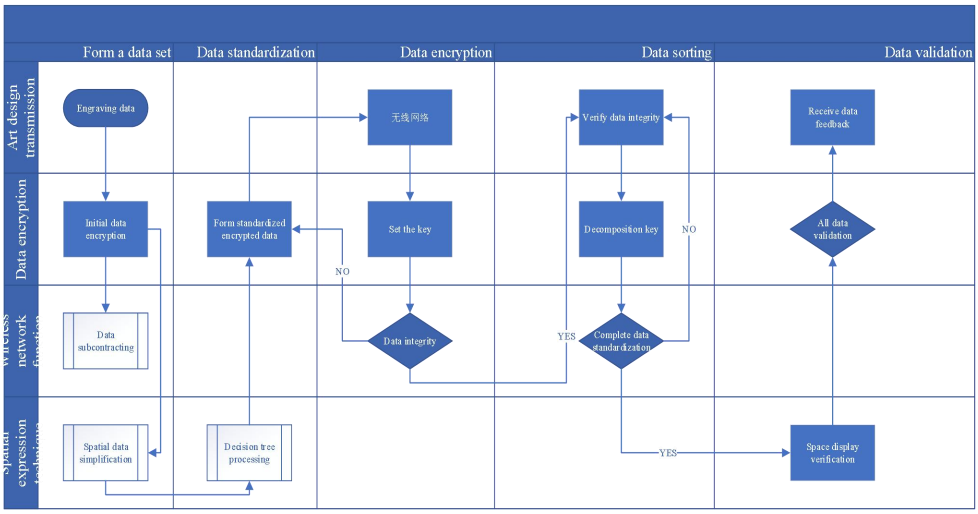

Figure 2. The Acquisition Process of Digital Engraving Technology Data

It can be seen from the data in Figure 2 that in the process of engraving digital value analysis, the data should be encrypted and integrity verified, and the later data distribution results and receiving feedback information should be verified [12], so as to realize the standardized processing of data, the real-time convenience of data, and the effective use of decision tree methods, and the processing results are shown in Table 2.

Table 2. Processing Process of Data Engraving Digital Information

Type / WIFI Calls Data Points in Time	Spatial Data	Digital Value	Key Value	Data Structure	Data Integrity
3:40 AM	86.82	87.87	80.06	82.65	89.29

12:58 PM	89.09	84.67	85.94	77.32	84.90
1:18 PM	85.01	85.69	87.68	84.09	89.46
1:21 AM	82.48	83.39	85.19	82.68	83.97
12:25 PM	85.45	84.29	76.14	84.23	82.47
12:35 PM	83.24	84.26	87.30	90.17	81.00
8:36 AM	91.15	87.09	85.01	86.78	86.42
5:44 AM	85.38	83.97	85.41	83.55	85.82
5:16 PM	88.24	85.20	84.47	86.26	83.72
10:44 PM	85.99	82.46	82.02	86.74	88.56
12:06 AM	84.80	88.74	85.29	87.31	85.54
10:46 AM	86.89	86.39	83.93	85.25	87.45
7:58 PM	83.56	81.44	87.16	80.53	83.61
10:42 AM	82.64	86.18	80.33	82.79	87.53

From the random mapping point sampling in Table 2, it can be seen that the processing results of the relevant data are good, and the integrity of the data is good, which verifies that the acquisition process of the engraving art design data is reasonable. The statistical rows of the data in Table 1 are analyzed and standardized, and the results are shown in Table 3.

Table 3. Processing Results of Digital Engraving

The Wireless Network Receives Data		**Digital Engraving of Digital Data**		**Data Correlation**
Data Socket Service	TCP/IP Layering	Spatial Representation Data	Engrave Data	
4321.16	13411.96	1465.07	3537.73	65.54
12709.83	7832.20	1158.16	1688.81	58.12
3822.77	11139.38	12951.65	13641.28	69.43
3984.27	3796.28	14409.14	12925.79	63.47
9282.43	544.94	6617.85	7882.00	74.69
3003.06	8418.51	10186.38	9823.00	71.62
797.14	243.22	8099.90	4777.75	58.55
9999.91	1944.19	2090.63	14144.22	74.72
7444.54	6902.57	7791.59	7482.86	63.27
8018.28	10434.73	4232.18	9948.48	66.99
10716.03	3051.75	3562.42	11951.08	74.08
430.57	4026.61	4740.68	3676.09	71.28
11453.31	1492.53	3538.72	2829.21	70.38

As can be seen from the data in Table 3, the difference between the data received by the wireless network and the actual data sent is low, and the data difference value is within 10%. Among them, the data value received in the wireless network and the data stability of the network protocol division are greater than 3 to 4%, indicating that the data received by the entire wireless network meets the requirements of digital engraving. There is also a small difference between the spatial representation of digital engraving data and the amount of engraving data, indicating that the difference between data sending and receiving is relatively small, and the security of the entire wireless network state is high.

In addition, the correlation degree of the data is greater than 60%, and there is no large change range, which further indicates that the correlation between the data received and sent by the wireless network is reasonable.

3.4 Calculation of Engraving Data Processing Based on Spatial Expression Techniques

There are three main types of data processing for spatial expression methods, namely engraving data simplification, engraving content simplification, and engraving structure simplification. The mathematical description of the above three treatments is as follows.

The simplified calculation of the spatial representation data is shown in Equation (4).

$$dv(x) = \sum \overline{x}_{ij} \tag{4}$$

The simplified calculation of the spatial representation method is shown in Equation (5).

$$con(x) = \sum x_{ij} \cdot x_i' \tag{5}$$

Formula (4)~(5) can obtain the data simplification result of the spatial representation technique, as shown in Table 4.

Table 4. Data Simplification of Spatial Representation

Time is Randomly Drawn	Data Complexity	Stability	Simplification Rate
6:47 PM	56.84	61.05	4.41
7:27 PM	79.26	66.52	9.43
1:10 PM	77.15	68.86	23.44
12:21 PM	72.04	69.78	16.64
6:39 AM	63.18	81.27	14.35
7:12 AM	79.19	71.36	13.92
11:26 AM	82.21	79.69	9.57
11:49 PM	67.99	77.98	23.42
2:12 PM	84.94	80.93	2.28
12:20 AM	75.44	68.39	21.99
3:37 PM	61.47	77.03	15.23
6:08 AM	75.33	80.81	19.72
8:15 AM	69.64	74.58	11.15

From the simplified analysis of the spatial representation method in Table 4, it can be seen that the complexity of the data in random sampling is less than 90% and greater than 60%, indicating that the sculpting data in the entire wireless network is in a chaotic state. The stability of the data is greater than 60%, indicating that the messy engraving data is still in a stable state, there are no characteristic values and outliers, and the data status meets the requirements, which also indirectly indicates that the wireless network environment is safe. In terms of data simplification rate, the overall simplification rate is less than 2 0%, and the individual data simplification rate is greater than 20%, which also shows that the spatial expression method can simplify the digital engraving data, but the simplification is small, indicating that there is still a large room for simplification of data.

3.5 Wireless Transmission of Space Engraving Digital Art Design

Wireless transmission of space sculpting digital art design includes data security, validity, and integrity, and the specific results are as follows.

1) Based on the safety judgment of the spatial expression method, the calculation is shown in Equation (6).

$$y_1(x_i) = a \cdot \vec{y}_{ij} + \vec{\xi} \tag{6}$$

2) Based on the reduction rate judgment of the spatial expression method, the calculation is shown in Equation (7).

$$y_2(x_i) = \omega' \cdot \frac{dep(y_i^2)}{\sum y_i^2} \tag{7}$$

3) Based on the completeness of the spatial expression method, the calculation is shown in Equation (8).

$$y_3(x) = \frac{y_3(x_i)}{\sum y_3(x_i)} \cdot 100\% \tag{8}$$

The optimization of digital engraving data by wireless transmission method is mainly reflected in two aspects; on the one hand, the structure of the data is optimized by the decision-making number intelligence method, and the structure and correlation of quantitative data are distributed reasonably to ensure the effectiveness of local transmission. On the other hand, the spatial expression method is integrated with the digital engraving method to simplify the overall data structure of digital design, and the feature values and association values of the data are verified and analyzed. Through the analysis of relevant data models, it can be seen that the digital engraving digital design based on spatial expression techniques has been greatly simplified and standardized, and the feature values of the data have been eliminated, laying the foundation for network wireless transmission.

4. Results and Discussion

4.1 Wireless Network Environment for Data Transmission

This paper uses the LABVIEW environment as the basis and combines WIF (15~20Gpics), Bluetooth (2.0 Version, 16Hz，20m), Zigbee(2.4GHz, 250kb/s) and other transmission technologies to analyze digital engraving digital data. Among them, 5 servers (DELL, 20T, 12G), LAN is built in the form of net, and a firewall is set on the net network side, the data communication adopts TCP/IP protocol (Windows), the client is a wind system, the data structure is a mixed structure, and the test time is 48h, the specific conditions are shown in Table 5.

Table 5. Wireless Network Environment for Data Transmission

Server Number	Hardware Condition	Software Conditions	Data Form	Transmission Volume (M)	Safety Standards
1	IBM Servers, Dell Computers, Light, WIFI Devices, Bluetooth	Wind System, SQ2000, etc., 360 Firewall	Mix	4589.10	Class III
2	IBM Servers, Dell Computers, Light, WIFI Devices, Bluetooth	Wind System, SQ2000, etc., 360 Firewall	Mix	12167.49	Class III
3	IBM Servers, Dell Computers, Light, WIFI Devices, Bluetooth	Wind System, SQ2000, etc., 360 Firewall	Mix	2376.10	Class III
4	IBM Servers, Dell Computers, Light, WIFI Devices, Bluetooth	Wind System, SQ2000, etc., 360 Firewall	Mix	4589.10	Class III
5	IBM Servers, Dell Computers, Light, WIFI Devices, Bluetooth	Wind System, SQ2000, etc., 360 Firewall	Mix	12167.49	Class III

The data in the above table is processed to obtain the corresponding engraving data values, as shown in Table 6.

Table 6. Overview of Digital Sculpting Data Based on Spatial Expression Techniques

Engrave The Content	Design Content	Form of Transmission	Standardish	Complexity
Engrave Blueprints	Two-Dimensional	Wireless	79.84	63.13
	Three-Dimensional	Wireless	70.75	74.35
Design Schemes	Layout	Wireless	73.64	71.07
	Material	Wireless	78.20	70.41
	Content	Mix	81.52	74.59
	Structure	Wireless	69.06	72.59
Color	Light	Wireless	72.57	75.14
	Dark	Mix	75.39	85.34
	Accent Color	Wireless	78.32	67.89
Form	Concave	Wireless	72.94	72.70
	Convex	Wireless	74.19	71.52
Proportion	1:8	Mix	78.62	69.89
	1:16	Mix	70.05	72.63
	1:24	Mix	69.83	74.93
	1:48	Wireless	63.56	66.81
Art Form	Ancient Times	Wireless	71.09	72.59
	Nowadays	Wireless	79.84	63.13
	Postmodern	Wireless	70.75	74.35

4.2 Improved Effect of Spatial Expression Technology

Artistry is an important indicator of effectiveness analysis, which can deeply analyze the direction of digital engraving, and the specific analysis results are shown in Table 7.

Table 7. Data Simplification based on Spatial Representation

Analysis Method	Content	Index	Simplification Of Engraving Data	Simplify Wireless Data Reception
Spatial Representation	Wireless Transmission	Structure Data	76.87	71.22
		Unstructured Data	76.66	71.06
		Semi-Structured Data	70.67	67.26
	Engrave The Content	Digital Engraving	75.66	71.56
		Artistic Engraving	79.32	76.53
		Scheme Engraving	72.44	70.95
	Security	Class I	72.91	78.28
		Class II	73.94	76.39
		Random	75.15	69.89
		Synthesis	75.86	80.49
		Directional	71.86	65.35
A Digital Sculpted Model based on Spatial Representation Digital Sculpture Model based on Spatial Expression Technique	Wireless Transmission	Structure Data	77.59	85.36
		Unstructured Data	69.73	71.26
		Semi-Structured Data	74.45	81.27
	Engrave The Content	Digital Engraving	70.79	74.45
		Artistic Engraving	76.00	68.96
		Scheme Engraving	76.68	67.66
	Security	Class I	72.39	79.38
		Class II	74.68	70.60
		Random	75.41	74.60

		Synthesis	76.25	80.64
		Directional	81.80	70.51

The process of determining the reduction rate in Table 7 is shown in Figure 3.

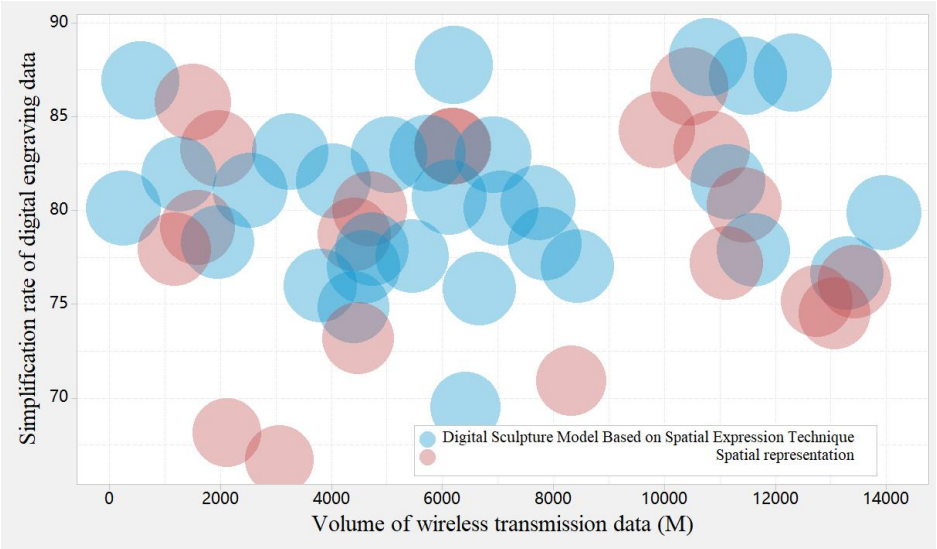

Figure 3. The Process of Judging the Simplification Rate of Engraving Information

It can be seen from Figure 3 that the method proposed in this paper has a high simplification rate for data transmission, and the data simplification rate can reach more than 70% in the data transmission process of 1.4 G, and the data simplification results run through the entire test process. The main reason for the above problems is the integration of TCP/IP protocol and decision tree method, which simplifies the transmission process of engraving data, reduces the frequency of terminal access to the server, and increases the amount of single-channel transmission, so as to realize the data transmission of engraving digital art design.

4.3 Engraving the Completeness of Digital Art Design

Based on the data integrity judgment of the spatial performance method, the completeness of different indicators is verified, and the analysis results of the completeness of different indicators are calculated, and the specific results are shown in Table 8.

Table 8. Integrity Of Transmitted Data in Digital Engraving

Index	Spatial Structure Data	Engrave Data	The TCP/IP Protocol Conforms to the Data	Server Receives	Channel Transmission
The Content is Complete	63.25	83.62	65.93	73.44	85.58
	61.50	65.84	71.04	69.99	64.61
The Transfer is Complete	77.14	81.72	86.63	76.19	76.59
	60.85	64.07	79.79	75.08	44.73

Table 8 shows the transmission and reception processes, as shown in Figure 4.

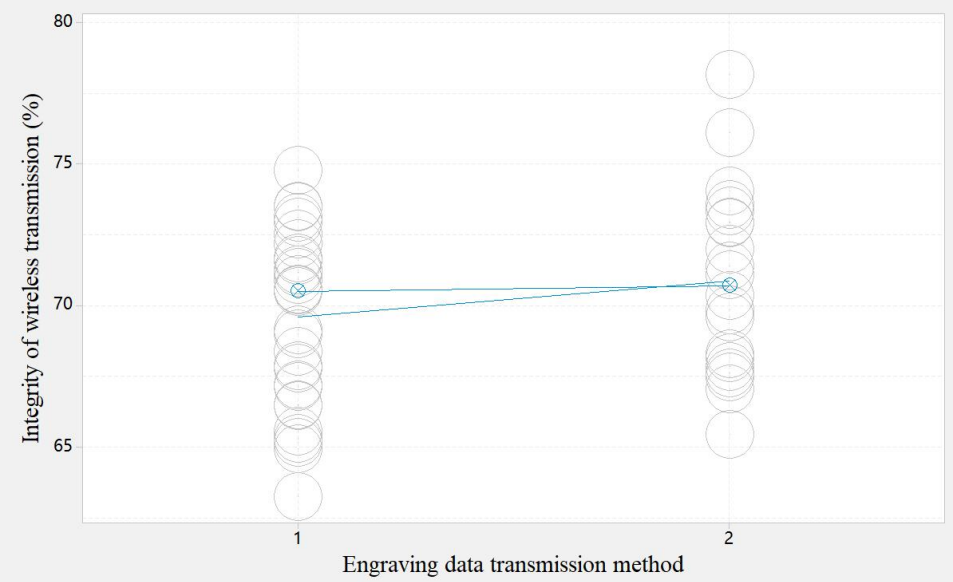

Figure 4. Data Integrity Analysis based on Spatial Expression Method (1 represents Digital Sculpture Model Based on Spatial Expression Technique; 2 stands for Spatial Representation)

It can be seen from Figure 4 that there are great differences between the mathematical model and the spatial representation method proposed in this paper, and the concentration of integrity, the distribution of integrity data, and the center node of integrity data are higher. The reason for the above problems is that due to the coordination role of TCP/IP protocol in data transmission, it is necessary to allocate IP addresses and channels with the help of decision tree methods. There are many unstructured data in the engraving data, so it is necessary to carry out standard processing on the spatial representation method and decision tree method to simplify the transmission amount of the signal and then improve the complete rate of transmission.

4.4 Engraving Digital Art Design Transmission Security

Security is the main impact of wireless transmission, in order to reduce the intrusion rate of external data, to encrypt and decrypt the engraved data, the key values should be password implanted, specifically, the results are shown in Figure 5.

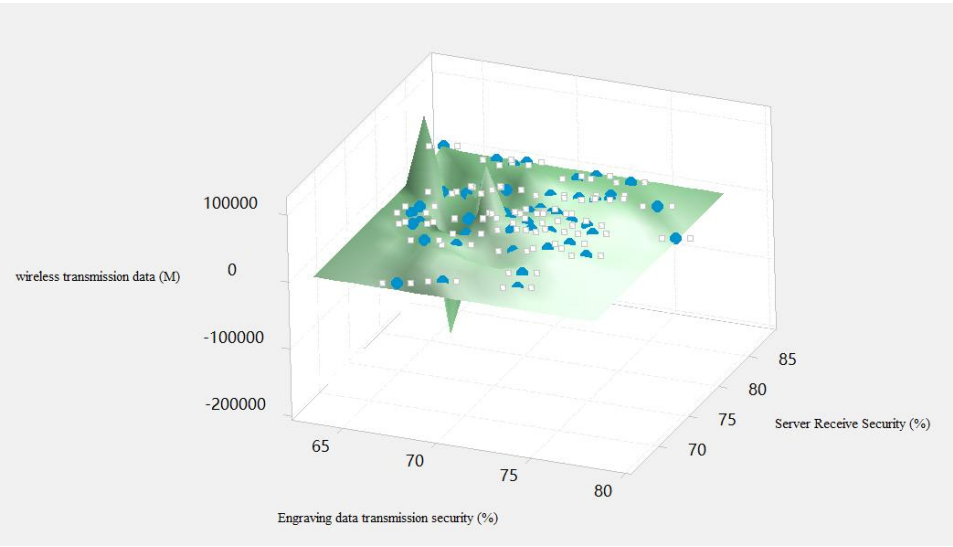

Figure 5. Security of Digital Engraving Data

From the data values in Figure 5, it can be found that in the analysis process of wireless transmission data, the transmission security of engraved data and the security of data accepted by the server are relatively high, greater than 75%. It is mainly due to the spatial performance method greatly simplifying the engraving of digital data, and integrating keys into the digital data, improving the

transmission rate and recognition rate of data in the channel, and reducing the chance of hackers stealing transmitted data. In the process of data analysis, some peaks occur, mainly due to the complex process of data engraving, and massive data will appear randomly, resulting in a surge in wireless transmission. The following safety analysis of different engraving indicators is shown in Table 9.

Table 9. Comparison of Digital Engraving Forms by Different Methods

Method	Content	Test Packet Recycling	The Wireless Network Receives Security
Spatial Representation	Spatial Content	90.72	Class III
	Color Content	96.50	Class II
	Engrave The Content	98.86	Class II
A Digital Sculpted Model based on Spatial Representation	Spatial Content	70.61	Class III
	Color Content	69.07	Class I
	Engrave The Content	72.81	Class I

The digital engraving model based on spatial expression has high data security in terms of spatial content, color content, and engraving content, the security level can reach level III, and the recovery rate of the test package is greater than 69%, indicating that the test of the entire data meets the requirements. In addition, there is no significant difference in packet recovery rate and security between spatial content, color content and engraved content, which also indicates that the decision tree method has a good optimization effect on engraved data, which can improve the transmission security of digital art design.

4.5 Data Transmission Accuracy of Engraving Digital Art Design

In order to verify the effect of wireless transmission on engraved data, the accurate judgment of data transmission in the channel is shown in Figure 6.

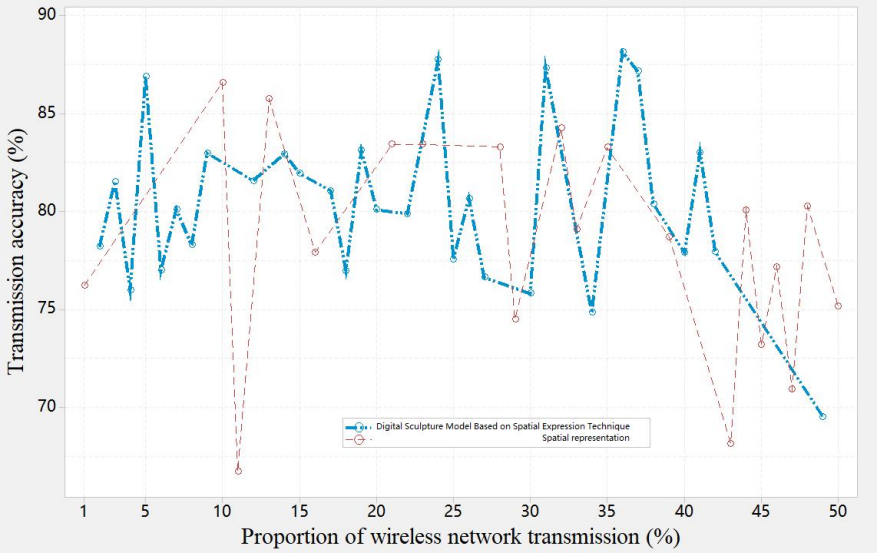

Figure 6. Wireless Transmission Accuracy of Different Algorithms

It can be seen from Figure 6 that the calculation accuracy of the digital sculpting data of the model constructed in this paper is higher than that of the spatial expression method Moreover, the utilization rate of spatial expression techniques, the recognition rate of digital engraving data, and the structural fusion between data are all good. The reason for the above problems is that the decision tree algorithm and spatial expression method simplify the digital art design data, and simplify the data structure and data complexity in the transmission process through the relationship between different

data, and improve the accuracy of data transmission. The following sample analysis of the data at different time points is shown in Table 10.

Table 10. The Data Transmission Accuracy

Extract Time	Send Content		Transfer Content Wirelessly	
	This Article Builds the Model	Spatial Representation	This Article Builds the Model	Spatial Representation
5:49 PM	85.21	72.96	76.20	65.42
8:56 AM	80.87	67.55	78.20	70.89
1:26 PM	74.06	67.12	81.53	65.30
7:14 AM	81.97	75.16	75.98	68.36
1:24 AM	79.18	71.52	86.91	66.48
3:23 AM	83.78	72.47	77.00	73.49
4:27 AM	82.25	77.94	80.12	68.97
7:05 AM	83.16	72.16	78.28	65.14
2:04 AM	85.66	66.48	82.98	67.13

The data in Table 10 shows that the sending content and wireless transmission content show good results in different sampling, which shows that the model constructed in this paper can improve the accuracy of digital engraving data, and also obtain good verification results in the sampling probability calculation. The reason for the above problem is that the wireless transmission adopts the decision tree method for TCP/IP protocol selection and selects packets according to the width of the channel, so as to improve the accuracy of data communication. In addition, this result also shows that the combination of wireless transmission and decision tree method can improve the transmission accuracy of engraving digital design data and reduce the influence of data volume and data complexity on the results.

5. Conclusion

Aiming at the wireless transmission problem of digital engraving digital design, this paper proposes a spatial representation method, which combines the decision tree method to digitally engrave data and constraints Standardize and compare with other methods to judge the accuracy, completeness, and simplification of digital engraving data transmission. The results show that compared with other methods, the accuracy and integrity of the model constructed in this paper for the transmission of digital engraving data are higher, which is greater than 90%, and the random sampling results did not change significantly. However, in the analysis of sculpture art design data, too much emphasis is placed on data simplification, lack of independence in the calculation of the particularity of complex data, and no repeatability analysis is carried out.

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