

# Artificial Intelligence Technology to Explore the Future Development of Traditional Handmade Leather Goods

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**Abstract.** In recent years, artificial intelligence technology has developed faster and faster, and many industries need to rely on artificial intelligence technology for transformation and upgrading. Therefore, research on artificial intelligence technology is of great significance to the development of traditional handicraft industry. The purpose of this article is to study the future development and exploration of artificial intelligence technology in traditional handmade leather goods, and to specifically propose the use of intelligent new technologies to enhance personal experience, use new Internet media to innovate traditional handmade leather goods display, and expand composite types. The number of talents and other suggestions to promote the development of traditional handmade leather goods. Combining the problems of the personalized handmade leather goods style system, the decision support system mode is adopted to effectively combine the traditional handmade leather goods quantification, feature extraction and traditional handmade leather goods recommendation. In-depth research on user preference model and handmade leather goods recommendation algorithm, and established a model of personalized traditional handmade leather goods style system. Experimental results show that 9 out of 10 users are satisfied with the handmade leather goods recommended by the system after 5 interactions.

**Keywords:** Artificial Intelligence, Traditional Handmade Leather Goods, Future Development, Exploration and Research

## 1 Introduction

The cross-border integration of design and technology has played an important role in the renewal of traditional art [1]. From the perspective of exploring new process forms and compatibility with a wider range of product requirements, the integration of intelligent applications in the design and manufacturing process of traditional process products can increase productivity and productivity, and increase the interaction between products and users [2-3]. The manufacturing and dissemination methods of traditional handmade leather goods promote the transformation and development of the traditional handmade leather goods industry. From the perspective of art products as a means of traditional media communication, the creation of art culture means new designs based on 3D printing, intelligent integration, virtual reality, augmented reality, and larger intelligent application technologies. According to this idea, handicrafts can become elements of a new culture,

defining culture in a new interactive way [4-5].

Nowadays, with the acceleration of globalization, traditional art has embarked on the road of commercialization, instrumentalization, and resourceization [6]. Some scholars argue that in a hyper-mechanized world, as a cultural heritage of mankind, traditional art should develop in the direction of restoring the humanity of mankind as a whole and ensuring cultural diversity. In addition, traditional art education should go beyond the purpose of preservation and inheritance, and expand its purpose with the source of restoration, practice, reflection, expansion and creativity of the human society as a whole. Whether traditional art will once again embark on the path of instrumentalization, commodification, and resourceization, or a channel for the restoration of human nature, this is the subject of human society as a whole, and the traditional art world in the new era also needs a moment of reflection[7]. Martin D conducted an in-depth analysis of the characteristics of traditional stippling and linked it to the common practice of non-photorealistic stippling and the capabilities and limitations of existing printing and display technologies. Based on the characteristics of traditional stippling (depending on the type of pen and paper used), we will focus on the perceptual research of digital stippling, which will provide further information for our discussion and work to understand the requirements of manual stippling reproduction. In order for artists and illustrators to faithfully replicate the stippling process in the digital realm, we extracted some guiding principles from the research results. For example, the characteristics of real points must be replicated because they are perceptible and must be based on the output device. Characteristic adjustment results [8]. The use of artificial intelligence technology can enhance the connection between people and products and between people, create sustainable culture and hot results, and form a relatively stable cultural communication cycle.

The research topic of this article mainly focuses on the combination of traditional handmade leather goods and smart material technology. The research object includes two levels: the first level, the research object is the product design of traditional handmade leather goods. On the basis of preserving the cultural characteristics of traditional handmade leather goods, improving functional practicability and interactive interest of traditional handmade leather goods, and meeting the needs of modern life, explore how to rationally combine smart materials with traditional handmade leather goods. At the second level, the research object is the intangible cultural dissemination of traditional handmade leather goods. Explore how to use traditional handmade leather goods as a carrier to provide a communication channel between media for the intangible culture based on smart materials. At the same time, connect products and networks, transition from "human-computer interaction" to "human-computer interaction", create a relatively stable cultural circle, and shape sustainable cultural exchanges.

## **2 Research on the future development and exploration of artificial intelligence technology in traditional handmade leather goods**

### **2.1 CAD system for handmade leather goods**

So far, the CAD simulation leather product system is a design assistance system, and its design direction strategy is to use an interactive system to provide designers with flexible and effective design tools [9-10]. Cognitive processes and technologies in the field of computer technology, such as computer science, engineering, related lighting and emission technology, fitness programs, etc., have not been successfully used in

leather CAD manual systems. With the advancement of computer functions and the continuous improvement of CAD technology for handmade leather goods, on the basis of auxiliary design, combined with machine learning, intelligent technology and other technologies and technologies, it will improve the understanding of CAD system simulation of handmade leather goods [11]. Levels inspire inspiration Design inspiration, stimulate creativity and imagination. The use of intelligent technology can reduce the operating difficulty of the system and improve the efficiency of the system. Therefore, this technology is also one of the development guidelines for manual CAD leather products [12].

## **2.2 Promote the development of artificial intelligence traditional handmade leather goods industry**

### (1) Use smart new technologies to enhance personal experience

Use new technology to attract new people, use new artists to spread, attract new audiences. By incorporating elements of the traditional handmade leather goods industry into online games, and experiencing and watching traditional leather products through AR technology, these methods are in line with the way young people are exposed to new things and spread traditional culture through these exciting new technologies. This can not only promote the inheritance and development of the handmade leather goods industry, but also increase the cultural self-confidence of the younger generation.

### (2) Expand the number of compound talents

The rapid growth of traditional leather goods requires the training of talents so that they can learn artificial intelligence while learning traditional leather goods. The expansion of traditional handicraft talents can mainly start from the following aspects: First, establish an effective government regulatory framework, provide certain support in terms of wages, wages, promotion and publicity, and encourage college. Students use the acquired knowledge and skills to enhance the value of traditional crafts and the ability to use artificial intelligence; secondly, they are connected with universities and give full attention to the effective talent courses of the Talent Academy, thus forming a cultural tradition. In the college simulation art, students who love traditional handmade leather goods are recruited to learn design and become the best successor of traditional handmade leather product simulation.

### (3) Innovate the display of traditional handmade leather goods with the help of new online media

Based on the existing Internet, we eagerly use the new media "micro-three-terminal" as the medium to innovate the way of displaying handmade leather products. Using these new media to promote handmade leather goods can not only highlight the cultural significance of the design more clearly, but also more accurately highlight the many characteristics of the technology, culture, art and products of customized leather goods.

## **3 Investigation and research of artificial intelligence technology on the future development of traditional handmade leather goods**

### 3.1 Traditional handmade leather goods design system

The development tool uses Microsoft Corporation Microsoft.NET. It is a new generation of Internet computer model launched by Microsoft. XML is an extensible markup language that has become a standard for data exchange. Web Services is a new idea proposed by Microsoft. It uses SOAP (Simple Object Access Protocol) and loosely coupled RPC mechanism as implementation methods, allowing different devices on the Internet to interact. Therefore, it solves the problem that the previous media such as DCOM, CORBA, RMI can not well solve the long-distance communication under the Internet environment. In the future, the software and services provided by many websites will become part of Web Services, which greatly saves development costs and improves the software reuse rate within the Internet.

### 3.2 User preference model and traditional handmade leather goods recommendation algorithm

The definition of a user preference model is a digital description of a specific preference from the submission of the user to the exit, including updating the user preference model as the user's preference changes.

This document represents the user preference model as two P:P (I, F) blocks. Among them, I is an array and F is a column vector. Each vector of series I is a chromosome in the result of genetic algorithm, and F represents the applicability of the corresponding chromosome. As shown in formula 1:

$$P = \begin{pmatrix} 0101 & 0101 & 0101 & 0101 \\ 0010 & 0010 & 0101 & 0101 \\ 1001 & 0101 & 1101 & 0011 \\ 1101 & 0110 & 0010 & 1110 \end{pmatrix} \begin{pmatrix} f1 \\ f2 \\ f3 \\ f4 \end{pmatrix} \quad (1)$$

Take the first 4 chromosomes to form the preference table I, and F is composed of the fitness function value of each corresponding chromosome as the weight of each sequence vector in the preference table. The expression of the preference model is shown in formula 2:

$$P = \begin{pmatrix} a_{11} & a_{12} & a_{13} & a_{14} \\ a_{21} & a_{22} & a_{23} & a_{24} \\ a_{31} & a_{32} & a_{33} & a_{34} \\ a_{41} & a_{42} & a_{43} & a_{44} \end{pmatrix} \begin{pmatrix} f1 \\ f2 \\ f3 \\ f4 \end{pmatrix} a_{ij} (i = 1,2,3,4; j = 1,2,3,4) \quad (2)$$

Get the similarity  $q$  (that is, the similarity of the two chromosomes, the similarity  $q$  is 0 by default). If  $x_i = a_{ij}$ , then  $q = q +$  the influence of the accessory on the style multiplied by  $f_i$  ( $i = 1, 2,3,4; j = 1, 2,3,4$ ), the comparison of handmade leather goods will not be made in the future Components. The dress code is compared with the 4 lines of the preference model, and finally compared with the similarity  $p$ . Find the following handmade leather goods of this style and compare the following handmade leather goods. Until all the handmade leather goods of this style are compared, they are classified according to the similarity  $p$  of the handmade leather goods, and the one with the greater similarity ranks first. The system provides users with top-level handmade leather goods.

## 4 Analysis and research of artificial intelligence technology on the future development of traditional handmade leather goods

### 4.1 Digital style design of traditional handmade leather goods

A successful handmade leather goods style always has obvious style characteristics. From a specific design to a series of styles, the unity of style must be ensured. For handmade leather goods designers, one of the prerequisites for creating their own brand is to ensure that their design styles are basically the same, and the styles of handmade leather goods will also be carefully adjusted with the changes in popular elements of the times. Therefore, every element provided by the system can have style characteristics, and the system provides users with a style with typical style characteristics as a design reference, and provides certain guidance for users to select components, thereby inspiring users' design inspiration. The design work completed by the user using the design software should also be saved, so that the user can specify the style type according to his own style definition. After the user selects a specific style category and style type, the system first provides a variety of standard styles with style characteristics, and the user can replace components and some settings according to the standard style for quick and convenient smart style design. The style design process is shown in Figure 1.

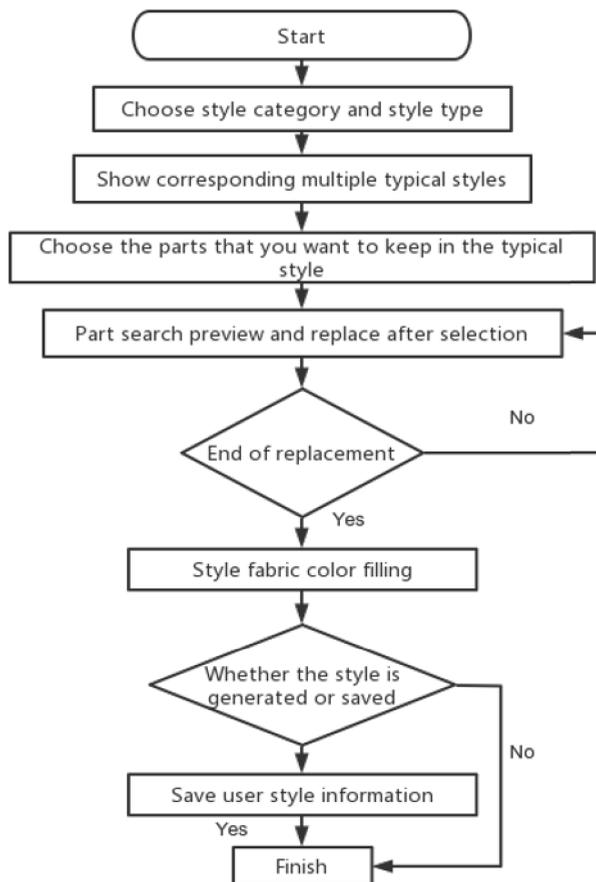


Fig.1. Style design flow chart.

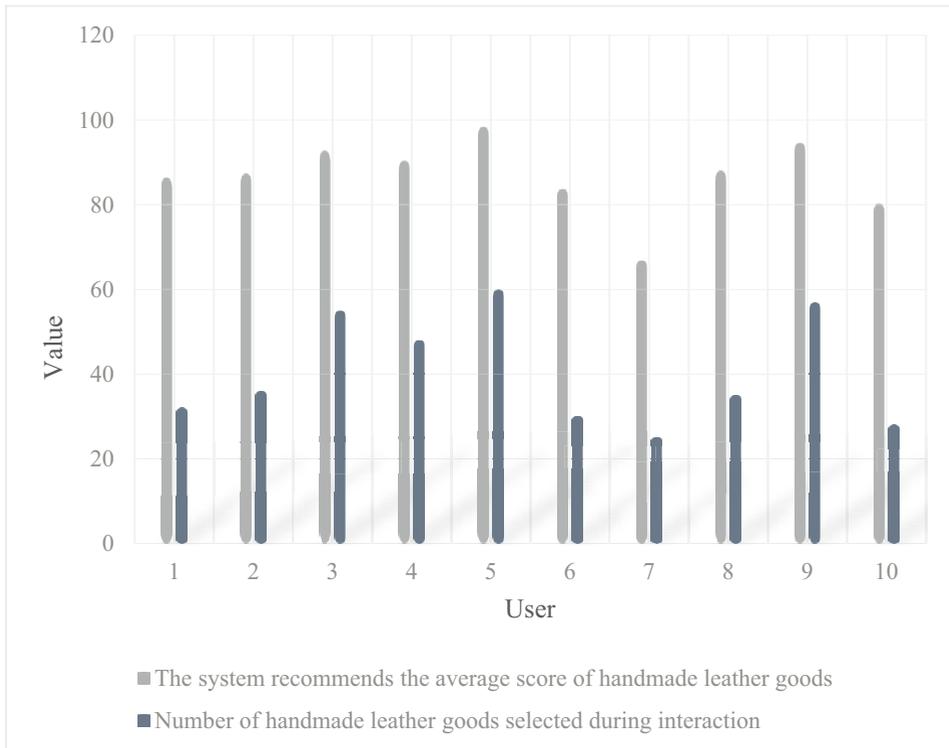
The digital style design is based on a large number of component materials. At the same time, the system should provide software users with a reference for stylized design, as well as a wealth of standard style materials. Using the user style library provides users with a window to create their own stylized and defined designs. The popular season and popular location of handmade leather goods are also an indispensable basis for user design. Therefore, the food material library must frequently update the modern popular style, so that the designed works can have popular characteristics, closely integrate with the times, and be accepted by the society, and the works can be vigorous. Therefore, the style library of the system database should include features such as style type, popular time, and popular location.

#### 4.2 Recommendation of handmade leather goods system

The system starts from the user interaction module. After the user logs in to the system, he first selects the style of handmade leather goods he needs, and then the system will present the handmade leather goods of that style in the handmade leather goods database to the user in a random order. Users start to score these handmade leather goods, and the number of handmade leather goods to be scored is up to the user. They don't want to continue scoring and just click to confirm. For some handmade leather goods that users dislike very much, it is not necessary to score them, and the information of the handmade leather goods will not be recorded. The user scored 50 pieces of handmade leather goods, and the system recommended handmade leather goods for the user based on the preference model. From all the styles of handmade leather goods selected by the user in the database, 25 pieces of handmade leather goods were recommended for the user and scored by the user, and the average score was 67.2. The user is not satisfied with the handmade leather goods recommended by the system and requires an update of the preference model. The system also requires the user to score each piece of handmade leather goods, in order to count the user's satisfaction, and the user can also view all the attributes of the handmade leather goods. If the user chooses to be satisfied, the current preference model is saved in the user database, and the whole recommendation process ends; if the user chooses not to be satisfied, the system will update the preference model and interact again. The system recommends handmade leather goods for him again. The 25 pieces of clothing users recommended this time scored an average of 89.2 points, and the users were basically satisfied. The following tests are performed on 10 users separately, and the user is first interacted with a single interaction without updating the preference model. The results are shown in Table 1:

**Table 1.** Results of a single interaction experiment.

User	The system recommends the average score of handmade leather goods	Number of handmade leather goods selected during interaction
1	86.4	32
2	87.4	36
3	92.8	55
4	90.4	48
5	98.4	60
6	83.7	30
7	66.8	25
8	88.1	35
9	94.6	57
10	80.3	28



**Fig.2.** Results of a single interaction experiment.

In general, the more handmade leather goods a user chooses when interacting with the system, the final score is relatively high, indicating that the more user information the system obtains, the larger the initial population of the genetic algorithm, and the closer the result is to the user's needs, as shown in Figure 2 show. In the update test of the preference model, each user is set to interact with the system at most 5 times. If the user is not satisfied at this time, it is considered that the user's preference acquisition has failed. The recommended handmade leather goods are satisfactory, and one user is still dissatisfied after 5 interactions.

## 5 Conclusions

In the era of smart buildings, technologies such as artificial intelligence, Internet of Things, big data, and cloud computing are the core. While exploring and pursuing "technical advantages", it is also necessary to return to the human subjectivity represented by "technical spirit". The research purpose of this article is to start with the design of handmade leather goods, through the understanding of real user needs, to make logical innovations and upgrades to the life of handmade leather goods, integrate into life, and make a design close to "life". "Human-centered" life, summed up a logical and applicable structure, and combined with the structure of handmade leather goods. Make the design and implementation of leather goods more rational user design. This article takes authentic traditional handmade leather goods as an example. Basically, using artificial intelligence technology as the means and method of implementation can not only solve the needs of consumers, but also arouse people's attention to the traditional art of handmade leather goods.

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