The Promotion Mode of Chinese Martial Arts under the Background of the International Development of Taekwondo Based on Artificial Intelligence

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Abstract: Chinese martial art is one of the representatives of Chinese culture, it has rich and unique characteristics. As a kind of Chinese martial arts, Wushu Sanda is not very optimistic in its development and promotion. Especially nowadays Taekwondo is very popular, and the promotion of Wushu Sanda has become more difficult. Aiming at the promotion of Wushu Sanda, this article proposes a new idea, which is to promote Chinese Wushu by designing a somatosensory game of Wushu Sanda on the basis of artificial intelligence.

1. Introduction

Sanda is an important branch of Chinese martial arts. It has been developed for more than 40 years. Although a relatively complete system has been formed during the development process, it has not done enough to promote it. If Wushu Sanda wants to continue to develop, it must innovate its promotion model, take the essence, get rid of the dross, and integrate with the new era. With the improvement of Chinese people's entertainment life, Sanda is gradually integrated with entertainment life. In recent years, somatosensory games have been sought after by everyone and have become an important part of the entertainment industry. Combining martial arts Sanda with somatosensory games is a new idea. Therefore, referring to the literature of Yang Ping, Ji Hua, Ma Lehong and others[1-3]，it is proposed to apply somatosensory games to Wushu Sanda on this basis, and design a martial arts Sanda somatosensory game. Players can control virtual characters to learn and review Sanda techniques without restriction. The game can attract more game players to know and understand Chinese Wushu Sanda and arouse their interest, which will help the promotion of Chinese Wushu Sanda.

2. Wushu Sanda somatosensory game design

2.1 Game characters, weapons, skills

This article designs a total of 5 virtual characters in the game. Aiming at the action characteristics of Wushu Sanda, when designing the characters, the weapons and skills of these characters are different. This article names the game characters separately. The first character is called Monkey King. His weapon is the golden hoop, somersault cloud, and seventy-two changes. There are three skills he

possesses. One is to keep his arm strength stable by the golden hoop when his physical strength is decreasing. The second is to use the somersault cloud to effectively avoid the opponent's fist and the third is to change the form of the game through seventy-two changes during the competition. The second character is called Erlang God. His weapons are trident, electric fist, and sky eye. The skill is that he can continuously jump in the air, and the landing speed is relatively fast. When in the ring, he can use special effects to increase the stage beauty. The third character is Nezha. His weapons are the universe circle, hot wheels, and huntian ling. His skills are strong leg strength, he can quickly hook his legs left and right, and he can move instantaneously. The fourth character is Princess Iron Fan. Her weapons are plantain fan and armor. Her skills are able to quickly dodge fists without fear of fists. She has high defensive ability and facilitates quick recovery of physical strength. The fifth character's name is Jiuweihu. Her weapons are seduction techniques and nine tails, each tail represents a life. The character has nine lives and can identify certain character skills and effectively defend. The basic skills of these five game characters are the basic movements of Wushu Sanda. Players can use the general movements of Wushu Sanda. On this basis, using the skills possessed by different characters during competitions has a greater chance of winning the game.

2.2 Game scene

The design of the game scene in this article is based on the game characters, and each character has a specific scene. When you choose Monkey King, the competition scene is Huaguoshan, the scene of Erlang God is Heavenly Court, the scene of Nezha is Li Mansion, the scene of Princess Iron Fan is Flame Mountain, and the scene of Nine-Tailed Fox is Qingqiu.

2.3 Game mode

2.3.1 Personal practice mode

This mode is aimed at the initial players of Wushu Sanda. When the initial players enter the game, they should hold somatosensory game grips on each of their left and right hands, while wearing a somatosensory game grip on each of their left and right feet, and check whether the instrument can be used normally. When the game officially starts, the system enters the player's basic information, and then matches a suitable virtual character for the player based on the information and recommends appropriate martial arts Sanda actions for the player based on the player's physical characteristics. There are six basic Wushu Sanda boxing methods and leg methods in the normal mode, which are left and right punching boxing, piercing boxing, copying boxing, left and right kicking, whip, and side kicking. Players can choose one or more of these skills for training during practice, and then the system will give points[4]. The score setting is 60 points or less for bad, 60 to 80 for medium, 80 to 90 for good, and 90 to 100 for excellent. Under normal circumstances, the player training skills need to reach a certain point to master, more skills, enter the advanced mode. Players in advanced mode need to master the three basic Sanda methods before they can choose the more difficult boxing methods to learn and practice, and they need to play the corresponding Sanda methods in order according to the boxing methods displayed on the game screen. The punching movements are required to be in order, and also meets standard correctness, then the score will be higher. The action difficulty in advanced mode is divided into five levels. The later, the faster the frequency displayed on the screen, and the smaller the target of Sand Strike. When the player is performing learning and training actions, each action needs to be hit within a set time to score a point. If the hit is wrong or the hit is not successful, the score will be deducted. The game system can obtain player rankings based on the data, allowing players to participate in ranking interactions.

2.3.2 Real confrontation mode

The real confrontation mode is the actual combat mode, and the junior players enter this mode after they are advanced and conduct practical exercises in this mode. At the beginning, they can try to play the real confrontation mode and choose to fight against lower-level humans and machines. There are referees during the game, and the format is five rounds, three wins, and each round lasts for 3 minutes. The competition process simulates the real Wushu Sanda competition scene, with off-site spectators, through the sound effects to simulate the sound of calling and applause. Like junior players, they can choose the most suitable martial arts Sanda skills, and choose the corresponding game character according to the skill requirements. When the player loses and scores, there will be system voice prompts. After a game is over, various detailed data will appear, such as the score, the number of punches and legs, and the hit rate. In this mode, the difficulty of the game is divided into three levels, and the three action coordinates are set to (xa, ya), (xb, yb), (xc, yc), θi represents the size of the action, and i represents the level of the action. There are three levels, the values are 1, 2, and 3. The formulas are shown in (1) and (2)[5-8]. Wushu Sanda somatosensory games are not restricted by time and place. Past matches can be viewed at any time, analyzed the movements of Wushu Sanda, and accumulated experience for the next match.

$$x_b = x_a + \sqrt{(x_e - x_a)^2 + (y_e - y_a)^2} \sin\theta_i \tag{1}$$

$$y_b = y_a + \sqrt{(x_e - x_a)^2 + (y_e - y_a)^2} \cos\theta_i \tag{2}$$

2.3.3 Man-machine battle, player battle mode

The man-machine battle and player battle modes are mainly for entertainment, which is less intense and tense than the above two modes. In this mode, it needs to add a few buttons on the handheld somatosensory device, there is no referee and martial arts Sanda leg method, and a special secret weapon is added to the glove, which is extremely powerful. The corresponding skills of the game characters in this mode are relatively unreliable. On the basis of Wushu Sanda actions, aerial Sanda skills are added. Players can combine Wushu Sanda actions according to their own needs, and their maximum speed and striking power will be displayed numerically [9-10]. In this mode, players can choose a variety of entertainment activities, such as Wushu Sanda square dance, Wushu Sanda drama and so on. After reaching a certain level, players can invite players they know to join the same faction and participate in the competition together.

2.4 Game interface design

There are mainly two Wushu Sanda somatosensory game interfaces designed in this article. The first interface is an introduction to the game control method. In this interface, players can choose the control method, understand the basic game rules and master the upgrade skills, and view the game characters. The second interface includes help, rules and precautions. The help contains the player's personal information, game records, game settings, etc., which the player can browse at any time. The rules are an introduction to the entire game, including the competition system, modes, and judging rules. Precautions are to remind game players when they are operating.

3. Analysis of experimental results

In order to prove that Wushu Sanda somatosensory game is helpful to promote Chinese martial arts, 100 players are invited to experience the game, evaluate various aspects of Wushu Sanda

somatosensory game, and conduct a survey on their satisfaction. The satisfaction survey results are shown in Table 1.

The statistical and analytical evaluation survey obtained the following results:

(1) The overall picture of the game: The game picture is in high resolution, simulating the real martial arts Sanda competition scene, and its picture is lifelike. Many people said that especially when they first entered the game, the animation was well-made and very atmospheric.

(2) Operation: More than half of the people think that the game is easy to operate, and there are prompts in the game, and it is very convenient to follow the prompts.

(3) Game characters and skills: According to the game experience survey, players believe that the game characters are very characteristic, and the skills possessed by each character are in line with the character's image, and the skill settings are unique and conform to the martial arts Sanda movements.

(4) Game mode and competition: Game experiencers believe that the game mode setting is reasonable, and the competition is fierce, which can attract more players.

Table 1: Survey results of game experience satisfaction

Very satisfied	Satisfied	Fairly	Dissatisfied
75	25	0	0

It can be seen from Table 1 that more than half of the players think the game experience is very good and very satisfied, and 25 people are satisfied with the game, which shows that the design of Wushu Sanda somatosensory game meets the needs of the public. In addition, during the investigation, the respondents were asked whether they had a basic understanding of Wushu Sanda through the game. The tested players indicated that they had a certain understanding of Chinese Wushu Sanda through the game and would recommend the game to friends and relatives around them. This is helpful to the promotion of Chinese Wushu Sanda.

4. Conclusion

In the era of artificial intelligence, somatosensory games, as an emerging product, have development potential and their own advancement. Combining martial arts Sanda with somatosensory games has a positive impact on the development and promotion of Chinese martial arts, opening a brand-new door for the promotion of martial arts. The Wushu Sanda somatosensory game designed in this article can let players know and understand Chinese Wushu Sanda, and arouse the interest of players, which is helpful to the promotion of Chinese Wushu. Due to our limited knowledge and skills, this article has shortcomings. We hope that we will have the opportunity to further study Chinese martial arts in the future and make a certain contribution to the promotion of Chinese martial arts.

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