

## **Retraction Notice**

The Editor-in-Chief and the publisher have retracted this article, which was submitted as part of a guest-edited special section. An investigation uncovered evidence of systematic manipulation of the publication process, including compromised peer review. The Editor and publisher no longer have confidence in the results and conclusions of the article.

RM and LC either did not respond directly or could not be reached.

# Visual analysis of forest sports and health tourism based on artificial intelligence

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**Abstract.** With the spread of the concept of green health, people pay increasing attention to health preservation and are keener to forest health tourism. It makes the forest sports health care tourism grow significantly, and the health care industry has become the basic requirement for people to enjoy a healthy life. However, to promote the healthy and sustainable development of health tourism, it is necessary to coordinate forest resources with people's growing demand for health tourism. How to coordinate forest resources and human needs is an abstract problem, so it is necessary to use artificial intelligence (AI) technology to make these abstract problems feel concrete, that is to say, to carry out visual analysis. To this end, we use AI technology to analyze the forest resources and tourism facilities in the forest from multiple dimensions and conduct a visual analysis of various indicators of forest sports and health tourism. The experiments show that the visual analysis of forest sports health tourism through AI technology can clearly observe the balance between forest resources and tourism, which can effectively promote the healthy and sustainable development of the forest health industry. © 2022 SPIE and IS&T [DOI: [10.1117/1.JEI.31.6.062008](https://doi.org/10.1117/1.JEI.31.6.062008)]

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## 1 Introduction

Accelerating the development of forest resources and developing green forest health tourism is an important way to transform clear waters and lush mountains into mountains of gold and silver.<sup>1</sup> The development of forest resources under the premise of taking forest protection measures can achieve the effect of both resource benefits and environmental protection. In recent years, due to social pressure and changes in the living environment, people pay increasing attention to health preservation, and naturally it has become a place that the public yearns for, thus promoting the vigorous development of forest sports and health tourism as a new type. Because the rhythm of urban life is accelerating, and nature is a place with a primitive atmosphere, the rhythm is slower, which can relax people's minds, so people are more yearning for nature of tourism. However, when tourism enterprises develop forest health tourism, they often ignore the protection of the forest environment to pursue higher economic benefits, which will lead to a series of ecological problems. To promote the green development of forest resources, a better way is needed to promote the balance between the development and protection of forest resources and achieve a balance between ecological benefits, economic benefits, and forest health effects. Maintaining the balance of resources, economy, and sports health care requires the use of artificial intelligence (AI) to visualize the needs of forest sports, health care, tourism, and forest ecology, so health care tourism enterprises can make reasonable forest resource development policies.

Through the visual analysis of forest sports and health tourism, it can promote the rational use of forest resources, achieve the effective balance of the public's health tourism needs and forest resources, and protect the ecological balance of the forest. This paper can provide an effective basis for tourism enterprises to formulate the development policy of forest health tourism.

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To achieve the two-way and stable development of the protection of forest ecological benefits and economic benefits, in a true sense, the clear waters and lush mountains will be transformed into mountains of gold and silver.<sup>2</sup> It can promote the development of wellness tourism, meet people's growing material and cultural needs, and make people rest physically and mentally through wellness tourism and improve their health.

To observe whether tourism can promote the physical and mental health of the public, a large number of scholars have carried out research on this. Among them, Ohe et al. investigated the necessary conditions for a sustainable rural business in western Japan, using a multidisciplinary collaborative research method, for example, from a physiological and rural management perspective, the effects of forest therapy tourism relaxation. The experimental results verified the physiological and psychological relaxation effects of forest therapy, which lasted for 3 to 5 days.<sup>3</sup> Although Ohe et al.'s research confirmed that tourism can promote human physical and mental health, it lacks specific theoretical support and is not convincing. Lan and Zhu proposed an algorithm and optimization model based on Hopfield neural network for the selection of special tourist routes. They designed characteristic tourist itineraries for leisure, sports, health care, outdoor experience, and flower season and proved that this route is reasonable and feasible.<sup>4</sup> The focus of Lan and Zhu's research was on the planning of tourist routes. The research on whether tourism promotes human physical and mental health is only mentioned little, and the research is not deep enough. Park developed a healthy food that can activate forest health tourism in agricultural areas by improving the satisfaction of tourists with the food experience of Zhongning Mountain on the Great Wall. The results of the survey showed that tourists can pass the dishes based on the food. Using seasonal ingredients and local specialties, it adds traditional flavors, further improves the effect of forest recuperation, and contributes to the revitalization of forest recuperation tourism.<sup>5</sup> Park's research focused on the issue of food recuperation in forest tourism. He verified the positive effect of forest tourism on human health from the side but lacked favorable experimental evidence. His research is relatively complete in theory but lacks practical verification and requires longer realistic verification. Vila et al. explored what sports active travelers are currently enjoying and which attributes they value most when choosing a destination, and what their spending patterns are. The results of the study show that active tourists are particularly interested in spending their discretionary time on tourism, and their daily spending at the destination is higher than that of general tourists.<sup>6</sup> Although Vila et al. conducted a survey on tourists' interest in tourism, there is no specific practice process. Park and Kim explored the impact of rural tourism experience on the therapeutic effects of mindfulness, mental resilience, etc. The results of the study found that rural tourism experience had a significant impact on therapeutic effects, including mindfulness and resilience.<sup>7</sup> Park and Kim's research on whether tourism has a therapeutic effect on the human body lacks strong data to support it. Although these studies have proved that tourism can promote human physical and mental health, they all have obvious shortcomings, that is, their studies are difficult to visualize.

The research of this paper has the following innovations: (1) this paper uses AI technology to carry out a visual analysis of the forest health tourism industry. The development of the health tourism industry becomes visualized, and it can also promote the rational development of health tourism resources. (2) This paper has a certain innovative significance in the study of vision. At present, most of the researches mainly focus on the interpretation of the concept of wellness tourism, and there are few researches on the visual analysis of the forest sports wellness industry. (3) In health tourism, this paper conducts experiments on the relationship between human activities and forest ecological environment. And this paper finds that the forest ecological environment is greatly affected by human activities, so it is necessary to specify good protection measures for the forest ecological environment.

## 2 Method of Visual Analysis of Forest Sports and Health Tourism

### 2.1 Artificial Intelligence Visual Analysis

In the rapidly developing information age, AI has had a huge impact on the lives of the public, such as the medical field and the infrastructure field.<sup>8</sup> Although AI may cause some jobs to be



Fig. 1 AI visualization.

unemployed due to excessive development, it can display some subtle changes that cannot be perceived by the naked eye in the form of specific data, which greatly facilitate our lives.<sup>9</sup> In addition, AI can also improve efficiency and time-saving in industries, such as industry, medical care, and education. The AI visualization is shown in Fig. 1.

AI can transform abstract information, such as the internal situation of the human body and the development of cities, into concrete information data that can be observed together. Using AI technology to visualize the sports health care, tourism industry can promote the development of the health care tourism industry and effectively control its development. Converting some abstract information into intuitive data information requires the use of AI algorithms to transform information and data. There are many types of AI algorithms, machine learning is one of them, including decision trees, random forest algorithms, logistic regression, support vector machine, naive Bayes,  $K$ -nearest neighbors,  $K$ -means, etc. The visual analysis of forest health tourism needs to analyze the ecological environment of the forest. One of the visual analyses is image visualization analysis. Because the AI acquisition device of the image will be disturbed by noise during the acquisition process, the image will be degraded and become blurred, and the image cannot be correctly identified. To convert the image into accurate visual data information, it is necessary to filter the collected image to make the image closer to the real scene, so the obtained data will be more accurate. According to the relationship between the noise and the transmission signal received by the image AI acquisition device, the noise of the image is generally divided into two types, namely, additive noise and multiplicative noise.

Suppose  $g(s, t)$  is the initially observed data on the image, and  $y(s, t)$  is the noise data of the image. The data finally identified by AI are  $r(s, t)$ , then the additive noise can be expressed by the following equation:

$$r(s, t) = y(s, t) + g(s, t). \quad (1)$$

The available equation for multiplicative noise is

$$g(s, t) = g(s, t) + y(s, t) * g(s, t). \quad (2)$$

The most obvious feature of additive noise is that the noise  $y(s, t)$  has nothing to do with the original observed data, no matter how the original observed data change. The output of multiplicative noise is not only related to the manually identified data but also to various signals around the device when the image was captured. To minimize the noise that interferes with the image, a suitable linear filtering method is usually used to make the image brightness gradually change, reduce the sudden gradient change, become clearer, and reduce the gray value of the image. The principle of denoising is as follows:

$$r(s, t) = \left[ \frac{1}{D} \sum g^*(s, t) + \frac{1}{D} * y(s, t) \right] * \alpha^2. \tag{3}$$

Among them,  $D$  represents a certain pixel in the image, and  $\alpha^2$  is the variance of the image, so it is necessary to denoise the pixels of the image one by one to improve the quality of the image.

Now that the quality of the image has been improved, it is necessary to use an AI algorithm to visually analyze the image, taking Fig. 2 as an example.

Use AI technology to visually identify Fig. 2, extract  $N$  pieces of data information from the original information in the figure.  $X$ ,  $Y$ , and  $Z$  are three features; the features extracted from Fig. 2 can be expressed as a matrix

$$S = \begin{bmatrix} g_{X1} & g_{Y1} & g_{Z1} \\ \dots & \dots & \dots \\ g_{XN} & g_{YN} & g_{ZN} \end{bmatrix}. \tag{4}$$

Then, there is Eq. (4) to get  $N$  submatrices randomly as follows:

$$S_1 = \begin{bmatrix} g_{X1} & g_{Y2} & g_{Z2} \\ g_{X11} & g_{Y12} & g_{Z13} \\ \dots & \dots & \dots \\ g_{X41} & g_{Y42} & g_{Z43} \end{bmatrix}, \tag{5}$$

$$S_2 = \begin{bmatrix} g_{X30} & g_{Y31} & g_{Z32} \\ g_{X41} & g_{Y42} & g_{Z43} \\ \dots & \dots & \dots \\ g_{X91} & g_{Y92} & g_{Z93} \end{bmatrix}, \tag{6}$$

$$S_N = \begin{bmatrix} g_{X15} & g_{Y16} & g_{Z17} \\ g_{X30} & g_{Y32} & g_{Z34} \\ \dots & \dots & \dots \\ g_{X60} & g_{Y64} & g_{Z68} \end{bmatrix}. \tag{7}$$

Suppose  $S_1$  is the decision tree 1,  $S_2$  is the decision tree 2, and  $S_N$  is the  $N$ 'th decision tree. Bringing these identified data into the decision tree will have  $N$  classification results. The final decision tree that has more classification results is the final visualization data of forest ecology. These data can be used as measurement data of forest resources and forest environment and can monitor changes in forest ecological environment. The number of these data is large, so it is necessary to use an artificial neural network algorithm to process these data information to obtain effective information faster. When the information obtained by AI enters the input layer of the

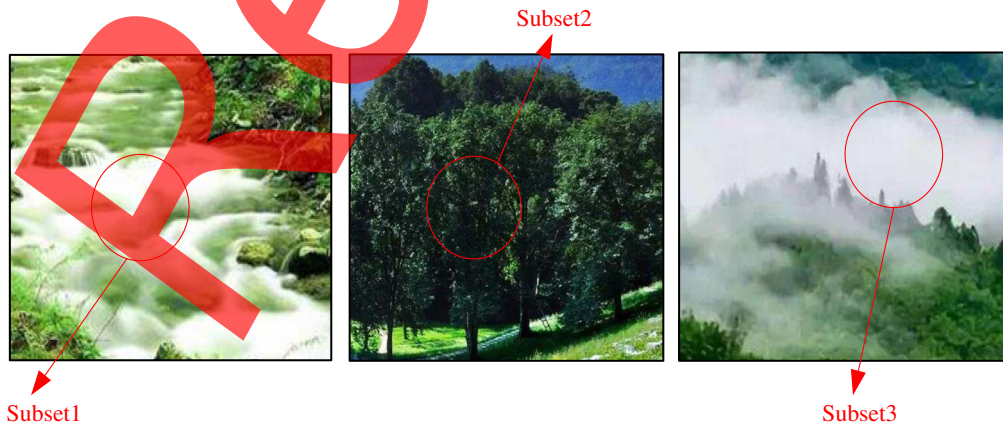


Fig. 2 Raw information.

artificial neural network for analysis, the data of the three characteristics of  $X$ ,  $Y$ , and  $Z$  will be classified and entered into the artificial neural network. Assuming that the total amount of data obtained through AI visual recognition is  $Q$ , the calculation of the total amount of data for  $X$ ,  $Y$ , and  $Z$  is as follows:

$$X = \frac{1}{3} * \sum_{v_1} Q * f(x), \tag{8}$$

$$Y = \frac{1}{3} * \sum_{v_2} (Q - X) * f(x), \tag{9}$$

$$Z = \sum_{v_3} [Q - (X + Y)] * f(x). \tag{10}$$

Among them,  $v$  is the transmission speed of the data in the artificial neural network,  $f(x)$  is the activation function of the artificial neural network, and its form is as follows:

$$f(x) = \frac{1}{1 + e^{-x}}. \tag{11}$$

From the input layer to the hidden layer, all data will be subdivided for analysis and then output to the output layer. In the hidden layer, the data will be analyzed in detail, as shown in the following:

$$X = v_1 * (X_1, X_2, X_3, X_4, \dots, X_n)^{i_1} * \vartheta, \tag{12}$$

$$Y = v_2 * (Y_1, Y_2, Y_3, Y_4, \dots, Y_n)^{i_2} * \vartheta, \tag{13}$$

$$Z = v_3 * (Z_1, Z_2, Z_3, Z_4, \dots, Z_n)^{i_3} * \vartheta. \tag{14}$$

Among them,  $i$  is the weight of the artificial neural network,  $\vartheta$  is the matrix generated by the artificial neural network when analyzing the data, and its form is as follows:

$$\vartheta = \begin{bmatrix} v & i \\ Q & t \end{bmatrix}. \tag{15}$$

Finally, the calculation of the total amount of data  $W$  output from the output layer is shown in Eq. (16)

$$W = v * s * (X + Y + Z)^e, \tag{16}$$

where  $v$  is the average speed at which the artificial neural network processes the data,  $s$  is the time it takes to analyze the data, and  $e$  is the threshold of the output layer in the artificial neural network. Using AI to visualize the development of forest health tourism can accurately grasp the changes in forest ecology and balance forest ecology and public needs. It enables the forest health tourism industry to achieve healthy and sustainable development, and enables forests to be effectively utilized. It plays a positive role in the physical and mental health of the public and can also drive the development of the service industry and the country's economy.<sup>10</sup> Health tourism needs to be limited to a fixed number of people, otherwise the environmental load will be overloaded.

## 2.2 Forest Sports and Health Tourism

The outbreak of COVID-19 has awakened people's pursuit of health and wellness. And wellness tourism conforms to people's pursuit of health and the change of tourism concepts. Therefore, the development of health care tourism has a broad market momentum.<sup>11</sup> Healthy tourism requires the integrity of the environment and the quality and economic strength of tourists. And wellness tourism is based on the natural ecology and human environment. It combines

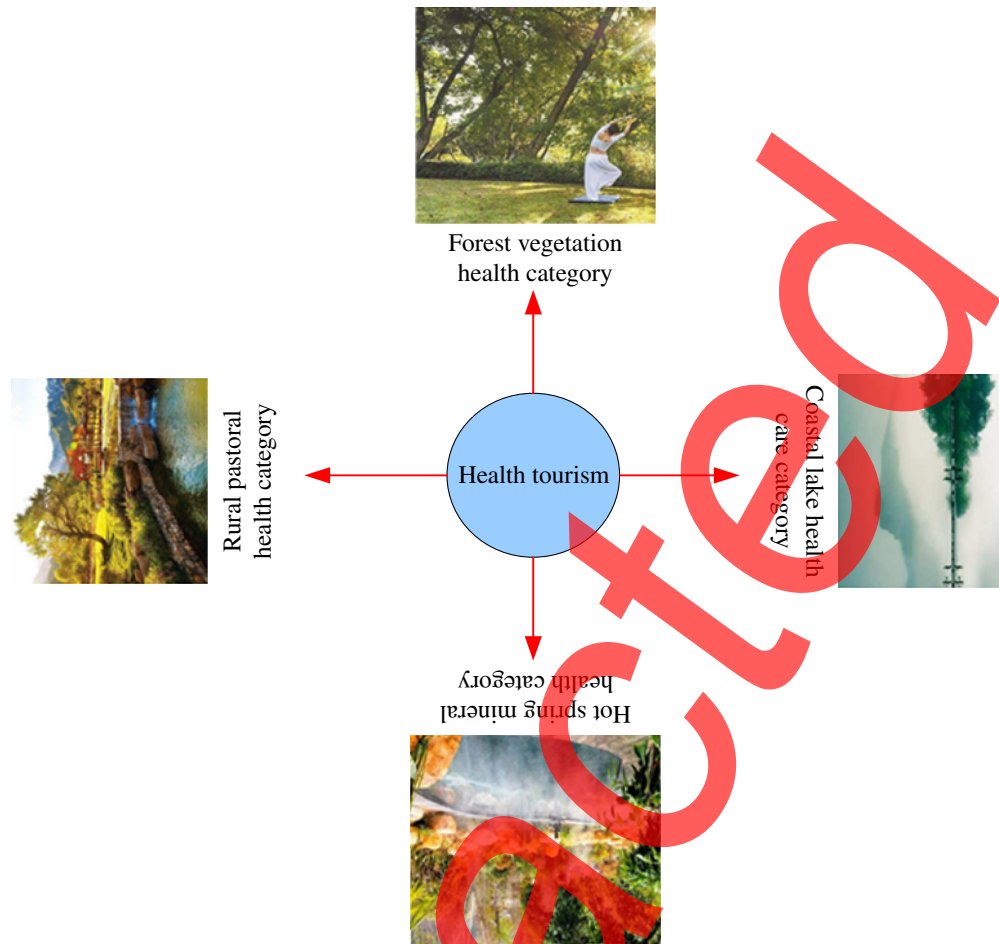


Fig. 3 Wellness tourism.

landscape viewing, cultural entertainment, physical examination, medical treatment, viewing flowers in spring, avoiding the heat in summer, enjoying the moon in autumn, soaking in spring in winter, etc., to achieve the purpose of relaxing the body and mind, improving one's emotions, nourishing the body, eliminating pathogenic factors, strengthening the body, and prolonging life.<sup>12</sup> Wellness tourism is shown in Fig. 3.

In Fig. 3, the health tourism industry can be divided into coastal lake health care, hot spring mineral health care, forest vegetation health care, and rural pastoral health care. Coastal lake health tourism is based on lakes, wetlands, oceans, and other water resources. It combines local characteristics of health preservation culture, urban villages, agricultural resources, industry and other resources, and medical resources to achieve the purpose of health preservation.<sup>13</sup> The hot spring mineral wellness tourism is a wellness industry based on the original hot spring medicine and hot spring recuperation, aiming at healthy and subhealthy people.<sup>14</sup> The benefit of wellness tourism is that it combines entertainment and health while driving economic development.

What this paper is about is forest vegetation health tourism, which relies on high-quality forest resources and organically combines modern medicine and traditional Chinese medicine. And it cooperates with the corresponding health care, leisure, medical, and health care service facilities to enrich the forest recreation experience, especially the construction of forest sports facilities.<sup>15</sup> The forest sports project is shown in Fig. 4.

There are many sports and health projects in the forest, including extreme sports, ball games, etc., which can achieve the effect of enhancing physical fitness. Extreme sports or ball games can be applied to the forest by combining with different sports facilities and equipment. The forest health and wellness tourism industry can solve the pension problem very well, and the rich forest resources also provide a good foundation for the development of the forest sports health care

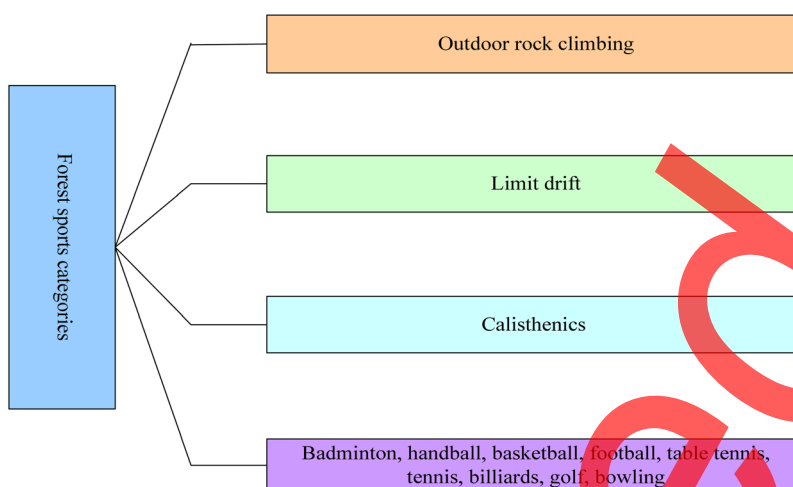


Fig. 4 Some forest sports projects.

industry. It can have a wider sports space, so the public can relax in the vast forest space.<sup>16</sup> Forest sports health care has the effect of “five cultivations,” namely, nourishing the body, nourishing the mind, nourishing morality, nourishing wisdom, and nourishing nature. With the development of urbanization and the accelerated pace of modern life, increasingly people want to return to a slow-paced life, so forest health tourism has become the first choice of the public. As an upgrade of traditional tourism, health tourism has more perfect infrastructure, and at the same time, it also adds the effect of health and wellness in traditional tourism, so the public is more enthusiastic about this kind of tourism project. However, with the rapid development of the forest sports and health care industry, some ecological problems of the forest will also appear one after another, such as the population carrying capacity of the forest. Some tourism companies may ignore the environmental benefits for economic benefits, resulting in the pollution of the forest environment.

At present, the forest health tourism industry, as a preliminary development industry, also faces some problems, such as a high degree of dependence on natural resources, resulting in an unbalanced industrial distribution, which makes the development gap between regions large.<sup>17</sup> Although there is government policy support, the support policies issued by the government are fragmented, independent, contradictory and conflicting, and there is no corresponding enforcement mechanism. In addition, the population of elderly and subhealthy people is large, and the market demand for forest sports health care is large, but the supply of effective services is insufficient. Therefore, although the current development of forest health tourism has bright prospects, it is still necessary to solve the existing development problems to ensure the green and healthy long-term development of forest sports health tourism.<sup>18</sup>

### 2.3 Visual Analysis of Forest Sports and Health Tourism

Visual analysis of forest health tourism can make better use of forest resources and provide better tourism services for the public.<sup>19</sup> In this case, it is necessary to visualize and analyze the indicators of forest health tourism development to understand the development of forest tourism. The indicators that need to be analyzed visually are shown in Fig. 5.

As shown in Fig. 5, the measurement indicators of forest tourism resources that need to be measured include forest area, vegetation richness, landscape resources, forest stand environment, and climate suitability. The significance of measuring these indicators is that the possibility of forest tourism development can be studied better. Among them, landscape resources are divided into human landscape and natural landscape, and the stand environment is divided into stand cleanliness, air negative ion concentration, air particle concentration, and oxygen content. These are some abstract and concrete objective existences. If it needs to accurately know whether a forest has conditions for health tourism, it needs to use AI to visually analyze these indicators.<sup>20</sup> Among them, the forest area is an important basic condition for the development of forest sports



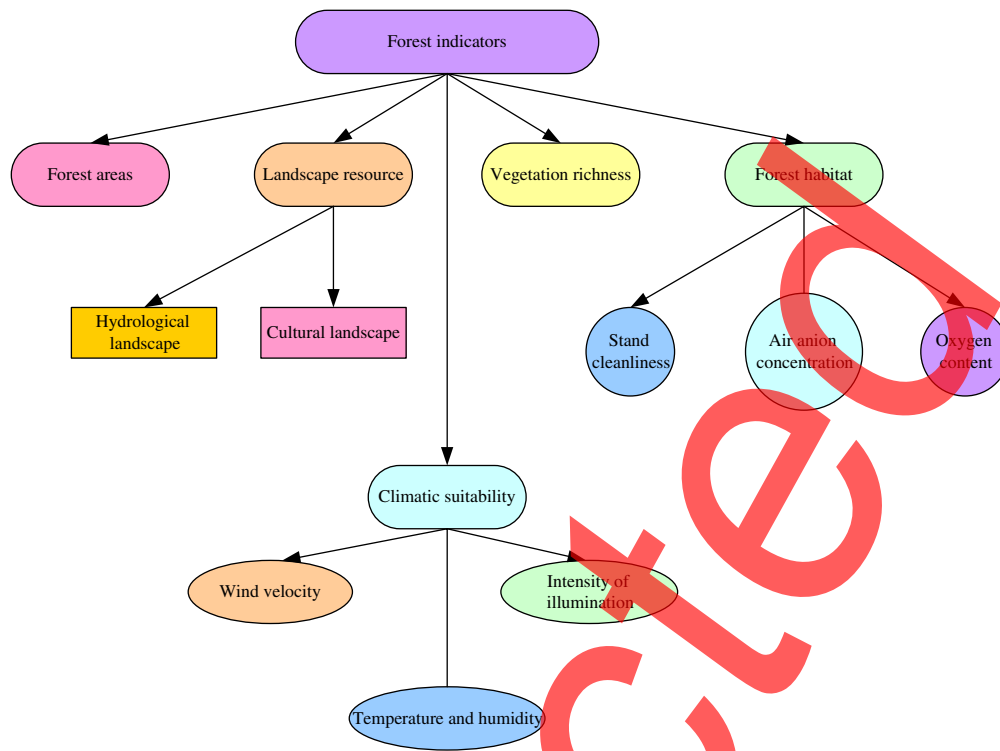


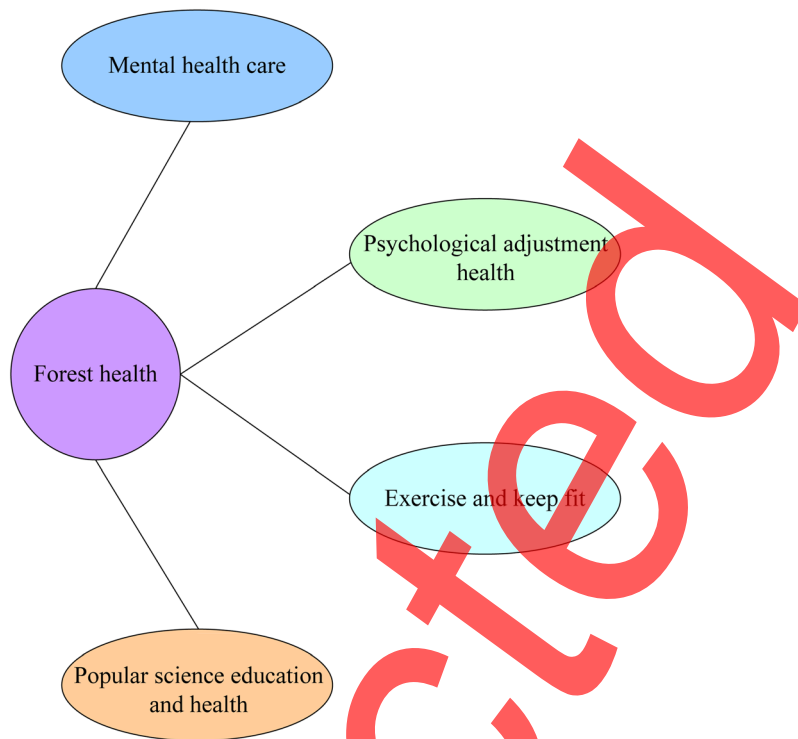
Fig. 5 Metrics for visual analysis.

and health care, which determines the reception capacity of tourist attractions for tourists. At the same time, the space for forest sports and health care activities is relatively wide, and the larger woodland activity venues are more conducive to tourists to carry out various forms and types of forest sports health care activities.<sup>21</sup> Regarding the distance between the sports venues for health care, it can be determined according to the status quo of landforms, geographical vegetation, etc., as well as the age and health status of the users. The area of the sports venues for health care can be determined according to the content of the activities and the current conditions. Then, the measurement standard of forest area is shown in Table 1.

And the larger the area of the forest, the better the effect on tourists' physical and mental recuperation. Although the larger the forest area, the more difficult it will be to manage. It can give tourists a sense of leisure to return to nature and rest psychologically, get rid of the oppression brought by urban life, and enhance the inner comfort of tourists. In addition, the higher the vegetation coverage, the higher the oxygen content in the air, the lower the noise pollution, and the better the forest environment. It can improve the comfort of tourists in the forest scenic area and greatly delight the tourists' hearts.

Table 1 Measures of forest area.

The evaluation index	Evaluation standard	Evaluation score
Forest area	The forest area is more than 500 ha	90 to 100
	There are more recreation areas of 100 to 500 ha	80 to 90
	There are more recreation areas of 10 to 100 ha	70 to 80
	There are 1 to 10 ha of recreation areas and only a few recreation areas	60 to 70
	Less than 1 ha and no recreation area	0 to 60



**Fig. 6** Forest health care.

Forest health care can be mainly divided into the following four categories, as shown in Fig. 6.

As shown in Fig. 6, forest health care includes four types of mental health care: psychological adjustment health care, sports fitness health care, popular science propaganda, and education health care. What this paper needs to discuss is the effect of forest sports health care, that is, exercise and fitness, on tourists' physical and mental treatment. It measures the changes of various physical indicators of tourists who love health tourism and makes it more intuitive, to help the development of the tourism industry of forest sports and health care. This paper conducts a visual analysis of the physical indicators of tourists who love forest sports and health care to see whether forest sports health care has a positive impact on the physique and psychology of tourists. It can provide data support for the promotion of forest sports and health tourism, so the health tourism industry has a broader market, and it can also drive more people to participate in physical exercise.<sup>22</sup>

Forest sports health tourism itself is based on forest, landscape, environment, food, ecological culture, etc. as the main resources and support.<sup>23</sup> It is equipped with corresponding sports service facilities and carries out a series of activities beneficial to human physical and mental health, such as forest recreation, vacation, rehabilitation, health care, and sports for self-cultivation, adjustment of functions, and recuperation. Therefore, this paper makes a visual analysis of the physical changes of tourists after forest sports health care, which can better promote the public's understanding of the forest sports health care industry and promote the long-term development of the forest sports health care tourism industry.

### 3 Experiment and Analysis of Visual Analysis of Forest Sports and Health Tourism

#### 3.1 Experiment on Forest Ecological Environment Change

##### 3.1.1 Experiment one

This experiment records the before-and-after comparison of the forest ecological environment changes affected by tourists in a forest sports and health tourism scenic spot in 2 to 4 months.

**Table 2** Forest ecological environment indicator data (unit: points).

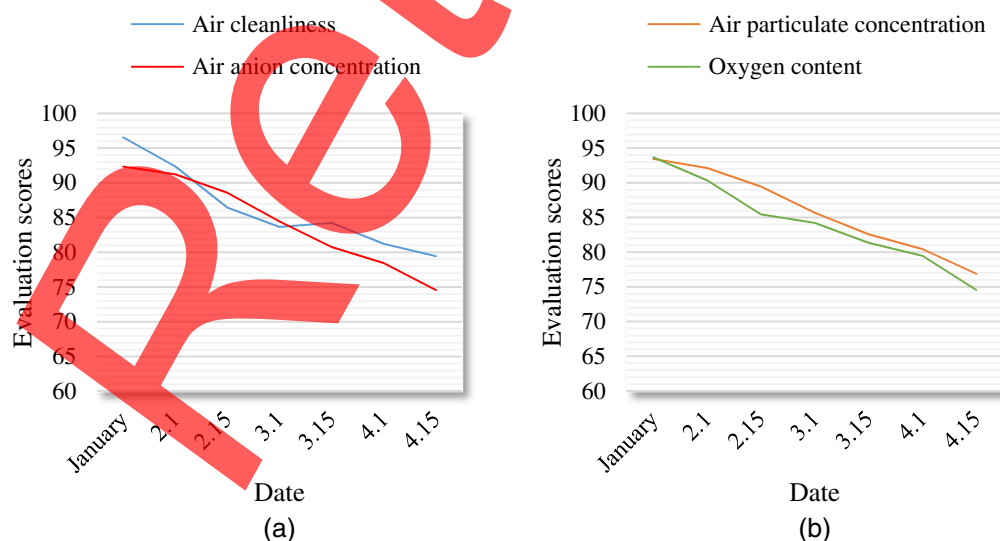
Ecological environment category	Evaluation	Other indicators	Evaluation
Air cleanliness	96.56	Vegetation richness	92.45
Air anion concentration	92.34	Climatic suitability	95.45
Air particulate concentration	93.45	Forest area	80.45
Oxygen content	93.67	Landscape resource	85.67
Comprehensive evaluation	94.005	—	—

First, we use AI to visually analyze the forest environment indicators of the scenic spot when it is not open in January. The recorded indicator data are shown in Table 2.

Table 2 records the data of various indicators that the scenic spot was open-ended in early January. The higher the evaluation score, the better the forest ecological environment. However, the lower the evaluation score of the air particle concentration, the higher the particle concentration in the air.

Because other indicators are basically fixed indicators at the beginning of the development of the scenic spot, and the forest ecological environment is most vulnerable to the impact of human activities. Therefore, this experiment is mainly to visually analyze the changes of the forest ecological environment before and after the opening. To this end, we monitored the changes in the forest ecological environment in the scenic area from February to April, and the data of the changes are shown in Fig. 7.

As shown in Fig. 7, the air cleanliness has been showing a downward trend since the opening of the subscenic area in February. However, in mid-March, the upward trend of air cleanliness was mainly due to the high vegetation coverage in the scenic spot and the relatively good self-purification ability of the scenic spot. However, from other aspects, the negative ion concentration and oxygen content in the air are getting lower and lower. In mid-April, it fell directly below 80 points, and the air quality was getting worse and worse. However, the concentration of particulate matter increased with the opening time of the scenic spot, indicating that the forest ecological environment was greatly affected by human activities.



**Fig. 7** Changes in forest ecological environment. (a) Changes in air cleanliness and negative ion concentration and (b) changes in air particle concentration and oxygen content.

### 3.2 Health Effect Experiment of Forest Sports Health Tourism

#### 3.2.1 Experiment two

This experiment uses AI technology to select eight tourists from the tourists who come to the forest sports and health care scenic spot, and there are four men and four women. The health status of these eight tourists from February to April was studied. The average age of these eight tourists is about 65 years old. They walk in the scenic spot and do some physical exercise every day. Before the experiment, their general health was not very good, and they had various ailments. For a better comparison, we recorded the physical and psychological conditions of the eight tourists' homes in the urban area. The data are shown in Table 3.

In Table 3, the blood pressure of normal people is <140 mmHg systolic blood pressure and <90 mmHg diastolic blood pressure; from the blood pressure measurement data in the table, these eight tourists are at risk of hypertension. The normal blood sugar value refers to the blood sugar value of 3.9 to 6.1 mmol/L when a person is fasting, and it is seen from Table 3 that these eight tourists also have the risk of hyperglycemia.

To this end, we tracked and recorded the physical and mental changes of these eight tourists in the scenic spot. After visual analysis, the comparison of blood pressure and blood sugar of these eight tourists before and after is shown in Fig. 8.

As shown in Fig. 8(a), the blood pressure of these eight tourists has reached the normal blood pressure value; the systolic blood pressure is below 140 mmHg, and the diastolic blood pressure is below 90 mmHg. The blood pressure basically reached the normal value, indicating that the forest sports and health tourism scenic spot has a good effect on the improvement of physical fitness.

The comparison of the psychological changes of these eight tourists before and after is shown in Fig. 9.

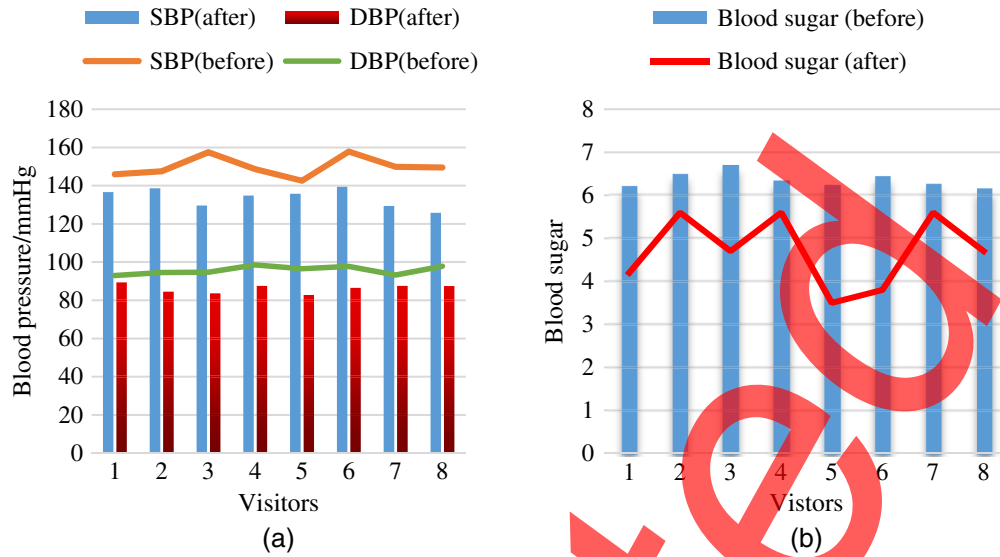
It is shown in Fig. 9 that the happiness and inner comfort of these eight tourists have been significantly improved after taking them in the forest sports and health tourism scenic spot for a period of time, and the highest can reach more than 90%.

### 3.3 Experimental Summary

The experiments show that the visual analysis of forest sports and health tourism can clearly see the changes in the ecological environment of the scenic area and the changes in the physical and mental quality of the public in the scenic area. Experiment 1 shows that human activities have a large impact on the ecological environment of the forest. Therefore, while developing the health tourism industry, it is necessary to always pay attention to the changes of the forest ecological environment to protect the sustainable and healthy development of scenic resources. Experiment

**Table 3** Physical and psychological conditions at home in tourist urban areas.

Visitor		Blood pressure		Blood sugar	Happiness (%)	Psychological comfort
		Systolic blood pressure	Dibutyl phthalate			
1	Male	146	93	6.2	60.45	57.48
2		147.56	94.56	6.5	57.56	67.58
3		157.5	94.7	6.7	69.45	62.45
4		148.678	98.56	6.35	64.35	53.67
5	Female	142.56	96.56	6.24	63.27	58.67
6		157.89	97.78	6.45	65.47	53.84
7		149.87	93.25	6.27	68.89	54.57
8		149.56	97.8	6.15	56.45	52.14



**Fig. 8** Comparison of changes in blood pressure and blood sugar: (a) blood pressure and (b) blood sugar.



**Fig. 9** Comparison of psychological feelings before and after (a) well-being and (b) inner comfort.

2 shows that traveling in the forest sports and health tourism scenic sport can greatly improve the physique of the middle-aged and the elderly and can also enhance the happiness of the middle-aged and the elderly. Health tourism has a positive effect on promoting the physical and mental health of the public.

#### 4 Discussion

This paper provides an understanding of AI visualization analysis, AI technology can help all aspects of human life, especially in the problem of transforming abstract things into intuitive information for people to understand. Just like the measurement of forest resources in this paper, we can use AI for visual analysis. At the same time, if it is necessary to further observe the changes in the forest ecological environment in the process of human activities, it can also use AI equipment to collect images and then conduct AI visualization analysis. And AI visual

analysis can be used in a wider range of fields, such as changes in urban development, urban development may not be able to get specific data. However, through AI visual analysis, the development and changes of the city can be directly observed in the form of data. Therefore, AI visualization technology can be applied to all aspects of human society.

The development of forest sports and health tourism depends on whether the forest resources are abundant and whether the climate is suitable. Forest sports health care can also help solve the three major problems of pension, resource allocation, and national physique. Because of the improvement of living material standards, the public is keener to travel, and the combination of tourism and forest sports and health care caters to the public's hobbies. At the same time, it can also improve the physical fitness of people and promote the health of people through sports in a good environment. At the same time, the forest has a high vegetation coverage, a suitable environment, and a slow pace of life, which is very suitable as a place for the elderly and can promote the physical and mental health of the elderly. Although there are still some problems in the development of forest sports and health tourism, the commanded forest resources and broad market can provide long-term support for its development.

The visual analysis experiment of forest sports health tourism in this paper shows that while forest sports health tourism plays a positive role in people's physical and mental health, it will also have a negative impact on the ecological environment of forest mountains. Therefore, while developing health tourism, it is also necessary to monitor the forest ecological environment to achieve a balanced development of ecological and economic benefits, to provide better services to the public, and to ensure that forest sports and health tourism can better improve the physical quality of the public.

## 5 Conclusion

First, we understand the AI visualization analysis technology. AI visualization technology can understand the development and changes of some places through images. As mentioned in this paper, the changes of forest ecological environment under the influence of human activities can be visually analyzed. We transform these invisible changes into appreciable data information. At the same time, we can make a visual analysis of the public's health tourism needs and grasp the balance between the forest ecological environment and the public's forest sports and health tourism needs. It can achieve the balance between ecological and economic benefits better, to ensure the long-term development of forest sports, health, and tourism. The experiments show that the visual analysis of forest sports and health tourism can adjust the contradiction between forest ecological protection and public demand. While realizing economic benefits, it can also promote the green and healthy development of forest ecology to ensure the healthy and sustainable development of forest sports and health tourism. However, there are still many deficiencies in the visual analysis of forest sports health in this paper. For example, we only analyze the changes of the forest ecological environment visually but do not study the specific changes of the forest ecological environment in depth. It is hoped that future research can further explore the changes of forest ecological environment under the development of forest sports and health tourism.

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