Research Article

Spatial Characteristics of Sports Tourism Destination System Based on Data Fusion and Data Mining

Shu Yu,1 Chenggang Qiu,2 and Ruizhu Yang3

1Harbin Sport University, Graduate School, Harbin 150000, Heilongjiang, China
2Heilongjiang Design Group Co., Ltd, Heilongjiang Provincial Institute of Urban Planning, Survey and Design, Harbin 150000, Heilongjiang, China
3Harbin Sport University, Physical Education and Training Institute, Harbin 150000, Heilongjiang, China

Correspondence should be addressed to Shu Yu; yushu@hrbipe.edu.cn

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With the development of information technology around the world, the research on the integration of data mining and data fusion is becoming more and more in-depth. In recent years, sports tourism has developed better and better, with the growing demand for tourism, and the tourism industry has developed by leaps and bounds. Tourism is a new economic growth point in many regions. But it also faces many challenges from both internal and external sources. The tourism destination system is an extremely important subsystem in the tourism system. The quality of its spatial structure not only affects the quality of tourism activities, but also affects the effective operation of the tourism function of the destination system. This paper studies the spatial characteristics of sports tourism destination system based on data fusion and data mining technology. The external environment of sports tourism development, the distribution of sports tourism resources, and the spatial structure of sports tourism are deeply studied by using Gini coefficient, nearest neighbor index, and other technical methods. A questionnaire was also designed to study the physical activity preferences of different age groups. The results show that the nearest neighbor index $R$ of fitness sports tourism destinations is less than 1, which is in a clustered distribution state. The main group of sports tourism activities is mainly concentrated in the age group of 16–45.

1. Introduction

With the advent of the experience economy, China’s sports tourism has developed rapidly, and sports tourism has occupied a prominent position in the planning of various tourism destinations. As a new form of tourism after the transformation and upgrading of the tourism industry, its development is largely dependent on the development of local tourism and on various environments and conditions provided by the economic and social development of the destination. Some places even ignore the actual situation of their own resources and the basis for the realization of sports tourism, which blindly develop. On the one hand, the investment in sports tourism is scattered, the development method is simplified, the product is single, and the capital cannot obtain suitable returns. On the other hand, the overexploitation and irregular development of resources have led to the waste of valuable resources and the destruction of the ecological environment around the sports tourism scenic spots, which inevitably restricts the development of the new tourism industry of sports tourism.

With the rapid development of China’s economy and the growing demand for tourism, the scale of the tourism industry continues to expand. Many industries see tourism as a new area of economic development and even develop it as a foundation or pillar company. Exploring sports tourism projects plays an important role in eliminating the blind development and construction of sports tourism facilities, building important venues for the sustainable development of sports tourism, and rationally developing and utilizing special sports foundations and methods to promote the healthy and sustainable development of leisure tourism.
People should grasp the stock of sports tourism projects in the core area, find out the characteristics of its spatial structure among the many factors that affect the spatial characteristics of the sports tourism destination system in the core area, analyze residents’ views on sports tourism, and maximize tourists’ satisfaction with tourism. It reflects the development concept of “people-oriented” and puts forward reasonable suggestions. The study also proposes feasible strategies to optimize the spatial structure and improve the overall competitiveness of the central region.

2. Related Work

The theory of complex adaptive systems believes that the power of system evolution essentially comes from the inside of the system, and the interaction of micro-subjects generates macro-complexity phenomena. Its research ideas focus on the interaction of internal elements of the system. According to the theory of complex adaptive systems, a tourist destination can be regarded as a complex adaptive system formed by the interaction of multiple adaptive agents. Yang discussed the spatial evolution process of southern Anhui tourism area. The rapid development of Xidi-Hongcun scenic spot and the establishment of Fangte tourist area have promoted the formation of more spatial agglomeration areas, and the scale has become larger and larger [1]. Recent research reports described cycling consumption as an activity strongly influenced by the intensity and sociality of its practice but failed to highlight the importance of spending related to participation in amateur cycling events and cycling touring experiences. From these behavioral dimensions, Ferrucci Luca proposed an original segmentation of the sports and leisure market, which identified the different characteristics of amateur cyclists. Data were collected through questionnaires, and information related to sports and consumption behavior was processed through a cluster analysis procedure [2]. The purpose of the Yan study was to identify the components of tourism culture marketing campaigns, surveying Chinese tourists who visited representative tourist attractions in Seoul. The difference and significance of the study is that it expands the research limited to product and service brands centered on incumbents by examining the impact of cultural marketing on the brand equity of Seoul’s tourist destinations, but the scope of application is not wide [3]. Some of the problems present in Croatian tourism are strong seasonality, lack of multiple foreign languages, underdeveloped transport structure, and homogenization of Croatian culture. Jennifer provided a brief history of Croatian tourism, current developments, and recommendations for changing management structures to increase the number of tourists to the state and improve the Croatian economy overall while focusing on an interdisciplinary approach [4]. Tensor decomposition, which extracted useful latent information from data tensors from multiple perspectives, had seen increasing popularity and adoption in the data mining community. Papalexakis E. E. introduced some of the most widely used tensor decompositions, provided key insights behind them, and summarized them from a practitioner’s perspective. It then provided an overview of a very broad range of applications where tensors play a role in achieving state-of-the-art performance, from social network analysis to brain data analysis, from network mining to healthcare [5]. Piccialli worked on applying data mining methods for IoT in the field of smart city framework and cultural heritage research to facilitate the exchange of ideas, discuss future collaborations, and develop new research directions. It is foreseeable that the application of the Internet of Things will increase the scale of data to an unprecedented level [6]. Sene described a formalization of the medical decision-making process under uncertainty based on conditional preferences, evidence theory, and exploiting high-utility patterns in data mining. To assist decision makers, the medical process (clinical pathway) is implemented using the Conditional Preference Bank (CPB). Using data mining, build information from different sources. Finally, to manage tolerance for uncertainty, a belief fusion algorithm is developed. A medical decision-making model under different uncertainties is proposed [7]. The ever-increasing power of technology had given researchers access to new, advanced statistical tools. Shapoval V. used data mining tools (decision trees) to analyze inbound tourist behavior for effective future destination marketing in Japan. Data mining methods largely eliminate the possibility of researcher subjectivity intrusion, facilitate useful discovery of certain tourist patterns in large datasets, and provide governments and destination marketing organizations with more tools to develop an effective destination marketing strategy better [8]. Authenticity is often understood as something akin to truth, or as an ability to “be yourself.” Hurych discussed some of the potential for finding ways to be authentic through the practice of some forms of sports tourism. Four model types of sports tourism activities were selected and described. The authenticity of the selected activities was evaluated in two rounds. Authenticity is thought to be a concept that is not strongly influenced by the external environment, but rather is closely related to an individual’s fitness and an individual’s (or group’s) perception of the external world [9]. The purpose of Irie Y’s research is to examine the sports tourism business model utilized by the Korean walking trail “Jeju Olle,” which has led to social change not only domestically, but also internationally. Jeju Olle is a nonprofit organization (NPO) that does not rely on administrative subsidies. NPO has successfully transformed an old country road into a stylish one and decorated it with gentle feminine touches, making it the famous “Olle” brand. Jeju Olle has changed the leisure activities, regional economy, and policy in Korea and is spreading to Olle in Kyushu and Olle in Mongolia [10]. The attendance rate of sports events continued to rise, and the attendance rate of a series of sports events increased in 2014. Nevertheless, the destination of hosting live sports events is still difficult to attract repeat visitors outside the scheduled events. Kirkup N. aims to better understand the relationship between motivation, attachment, and loyalty in event tourism. The existing contributions of these fields are discussed using the literature of sports and tourism, and the relationship between the three structures is investigated for the first time. A theoretical model is preliminarily outlined.
to describe these relationships, but the research results are not clear [11]. The above research has carried out a detailed analysis of data mining technology and tourism industry. It is undeniable that these studies have greatly promoted the development of the corresponding fields. We can learn a lot from methodology and data analysis. However, there are relatively few studies on sports tourism with data fusion and data mining techniques, and it is necessary to fully apply these techniques to the research in this field.

3. Method of System Spatial Characteristics of Sports Tourism Destination Based on Data Fusion and Data Mining

Data fusion is the removal of useless energy and incomplete information from incomplete data (usually sensitive data) obtained from multiple sources in the local environment. It can perform multisource integration, reduce information uncertainty, improve the authenticity and consistency of the system, achieve high precision and rapidity in decision-making, analysis, and response, and reduce system risks. Data fusion is an interdisciplinary field, including computer technology, automation technology, and computer technology. Data fusion is the multidirectional, multilevel, and multifunctional processing of massive data to generate meaningful information and bring useful information to decision makers, and it has the characteristics of high speed, low cost, and high reliability [12]. Sensors come from many data storage systems and are not necessarily real sensors. Figure 1 shows a schematic diagram of sensor-received data integration, and the information integration between sensors improves the performance of the sensor system [13].

Data fusion refers to the use of related techniques to process data from multiple sources to optimize the system and provide decision makers with a basis for decision-making based on the processing results. Data fusion technology includes the collection, transmission, synthesis, filtering, correlation, and synthesis of useful information from various information sources, in order to assist people in situation/environment determination, planning, detection, verification, and diagnosis [14]. Figure 2 shows the data fusion processing model. This model is essential for generalizing the basic concepts and theories of data fusion.

In the process of data fusion, the information provided by sensors is uncertain to some extent, and data fusion is actually an extraction process of uncertainty [15]. According to the known sample data, the neural network uses a special learning algorithm to extract the uncertainty reasoning mechanism to acquire knowledge. Therefore, neural network research provides a good method for the development of data fusion technology.

As a fusion method, neural network technology can be widely used in the fusion of data level, feature level, and decision level. Most of the merging is done by exploiting the nonlinear approximation ability of neural networks, obtaining merged patterns through offline learning of a large number of samples, and finally electronically merging multiple information sources [16]. The BP network model is divided into input layer, hidden layer, and output layer, and there can be one or more hidden nodes according to needs. The transfer function is generally a sigmoid function:

\[
f(x) = \frac{1}{1 + e^{-x}}
\]

The output of the qth neuron in the hidden layer is

\[
S_q = f \left( \sum_{p=1}^{m} w_{pq}x_p - \theta_q \right), j = 1, 2, \ldots, n.
\]

To make it

\[
IN_q = \sum_{p=1}^{m} w_{pq}x_p - \theta_j;
\]

Then, the formula becomes

\[
S_q = f(IN_q).
\]

The output node computes the output as

\[
Y_k = f \left( \sum_{q=1}^{m} v_{kq}S_q - \theta_k \right), k = 1, 2, \ldots, n.
\]

To make it

\[
IN_k = \sum_{q=1}^{m} v_{kq}x_q - \theta_k
\]

\[
Y_k = f(IN_k),
\]

\[w_{pq}\] is the network weight between the nodes of the input node, and \[v_{kq}\] is the network weight between the hidden node and the output node. The BP algorithm is a class of driven learning algorithms used to learn the weights and
thresholds of the BP network. The formula for calculating the jth sample error is

$$e_j = \frac{1}{2} \sum_k (r_{kj} - g_{kj})^2$$

(7)

Among them, $r_{kj}$ and $g_{kj}$ are the expected output and the calculated output of the network, respectively.

Data mining techniques cover methods from a variety of disciplines, such as cluster analysis, machine learning, and visualization techniques. Data mining is the process of manipulating data with the aim of extracting knowledge templates from large databases that describe the data. Data analysis focuses on “analysis.” It must have a certain data sensitivity and mathematical foundation, understand conventional data analysis methods, and use some tools to obtain expected results. Data mining focuses on “mining,” which is responsible for receiving requirements and then producing results. The object of data mining can be any type of data source. It can be a relational database, such as a data source containing structured data; it can also be a data warehouse, text, multimedia data, spatial data, time series data, Web data, such a data source containing semistructured data, or even heterogeneous data. Due to the different functions and data sources of data mining, there are many related steps involved in the process, and many are not the same. Generally speaking, the data mining process can be divided into the following five categories, as shown in Figure 3.

A short model for data fusion using data mining techniques: first, the data collected by the sensors is stored in the database; then, through data mining processes such as data selection, data prediction, data mining and model transformation, and model analysis, the model can be applied to the area where the sensor is located, so that it is most effectively available in the sensor range. This is a closed-loop system that combines data mining and fusion processes, which can automatically configure itself, thereby improving the performance of the loop system.

The combination of sports and tourism is the practical need of social and economic development, the need to release the pressure and tension of modern urban life, and the result of the development of social sports and tourism to a
certain extent. With the development of sports tourism and changes in modern lifestyles and concepts, the development of sports tourism will become a new trend, providing more space for the integration of sports and tourism. Sports is the main form of activity and the main content of the spectacle. The development of sports tourism should follow appropriate socioeconomic principles while respecting economic trends. The human resources of sports tourism can be divided into folk customs, events, and architectural scenes; the natural resources of sports tourism can be divided into landform resources and water bodies, as shown in Figure 4.

Spatial structure refers to the spatial patterns implied and organized in the operation and production of natural social processes. In a sense, spatial structure is the result of abstracting space and understanding it as a pattern of separation from territory. Although different disciplines have different perspectives on the study of spatial structure, in the specific content of spatial structure research, a research method combining space and time is often used, emphasizing the element composition, functional strength, and evolution history of space.

Tourist Destination District (TDD), simply put, is a place or main activity area that can meet the leisure purpose of tourists, or a complex of several factors that provide tourists with tourism needs at the end of the journey, such as attractions, entertainment, accommodation, shopping, enjoyment, experience, or certain services, that is, a specific geographic space. Tourism resources are organically combined with specific tourism facilities, tourism infrastructure, and other related conditions to become a destination for tourists’ stay and activities; or it is considered a place that tourists choose to visit, where they stay at least one night and get the desired tourist experience or benefit. Generally speaking, a tourist destination is an integrated territorial unit with a unique market image, in terms of utility, what tourists perceive as being more efficient than their usual place of residence and other alternative destinations, and they will get more and better benefits from a particular destination. So, it can also be said that a tourist destination is the sum of the different spatial elements that can motivate tourists and try to realize their motivation, and a tourist destination can have a wide range of meanings. It refers to a specific functional tourist destination, a city, or even a country as a whole, without clear spatial boundaries.

Cities are an important part of the spatial structure of regional tourism, the hub of regional tourism, and have multiple functions at the same time: tourist source, destination, gateway and distribution center, etc. Due to the differences in the quantity and quality of tourism resources, the scale of tourism demand, the intensity of tourism traffic, and other factors, cities, as the core of tourism spatial structure, have a certain level of hierarchy.

A travel destination is an extremely important element in the travel system, because it is an important part of attracting travelers to consume, not just a place to make travel products, but a subsystem that has the greatest relationship with travelers. The functionality of a system depends on its structure. If the structure of the system is reasonable, and the relationship between the elements of the system is harmonious, then the overall function of the system is very good, and the stability of the system is very high. Figure 5 is a conceptual model of regional tourism spatial pattern.

The conceptual model of the regional tourism spatial model is based on the cluster of tourist attractions, with the reception base of the tourism community as the center, emphasizing the development of the physical elements of the spatial tourism system and their coordination with each other. Special emphasis is placed on the interaction between the community and the development of tourist attractions; that is, the attraction cluster should be based on the interaction between the community and the development of tourist attractions, and it is a relatively well-structured spatial tourism development unit. The category and attractiveness of attraction groups (scenic spots) determine the attractiveness
level of the destination; the external and internal accessibility conditions determine the accessibility of scenic spots and communities, respectively; the quality of tourism services determines the quality of services provided by the community. There are close connections and associations between the spatial structure elements of urban tourism destinations. It includes various specific spatial structure types, such as the spatial structure system of urban tourism resources, the spatial structure system of urban tourism traffic, and the spatial structure system of urban tourism industry. In general, the spatial structure system of urban tourist destinations is composed of various elements, which mainly have the following characteristics, as shown in Figure 6.

The spatial characteristics of the sports tourism destination system are analyzed from two aspects: distribution situation and spatial network structure. Through the degree of agglomeration and equilibrium, the degree of dispersion of the spatial distribution of the developed sports tourism resources is discussed, and the spatial distribution situation is revealed.

Due to the large number of tourist landscapes (points), the most representative point can be selected from the numerous point-like landscapes, and the nearest point index $R$ is selected, and its value $R$ is calculated by the formula.

$$ R = \frac{d_1}{d_2} = 2\sqrt{D \cdot d_1}, $$

$$ d_2 = \frac{1}{2\sqrt{n/a}} = \frac{1}{2\sqrt{D}}, $$

$$ D = \frac{n}{a}. \tag{8} $$

In the formula, $d_1$ is the distance between the closest points, $d_2$ is the theoretical closest distance, and $D$ is the spatial point density. The range of $R$ is between 0 and 1. When $R > 1$, the elements tend to be uniformly distributed; when $R < 1$, the elements tend to be distributed centrally; when $R$ is 1, the elements are randomly distributed.

Gini coefficient refers to an internationally, commonly used index to measure the income gap of residents in a country or region. The Gini coefficient (Gini) is used to measure the equilibrium of the spatial distribution of sports tourism destinations, and the calculation method is as follows:

$$ G = \frac{\sum_{i=1}^{N} p_i \ln p_i}{\ln N}. \tag{9} $$

In the formula, $p_i$ is the percentage of protected areas in each partition, and $N$ is the total number of partitions. The maximum Gini coefficient is 1, and the minimum is 0.

Connectivity is a measure of how well a network is developed. The spatial structure of a destination is measured by the connectivity of the transportation network between the nodes of the destination system, usually analyzed using $\alpha$, $\beta$, and $\gamma$ indices.

3.1. $\alpha$ Index. The $\alpha$ index is a measure of the periodicity of the transportation network. The degree of connectivity is analyzed by studying the relationship between the number of loops in the regional network and the theoretical maximum number, as shown in the following formula:

$$ \alpha = \frac{N - n + 1}{2n - 5}. \tag{10} $$

**Figure 5: Conceptual model of regional tourism spatial pattern.**
Among them, $\alpha$ represents the loop length of the network, $N$ represents the number of edges in the network, that is, the number of direct traffic connections between two nodes, and $P$ represents the number of nodes in the network. $\alpha = 0$ means that there is no traffic loop; $\alpha = 1$ means that the number of loops has reached the theoretical maximum.

### 3.2. $\beta$ Index

The $\beta$ index represents the average number of nodes connected in a spatial network and is an important indicator to measure network connectivity, as shown in the following formula:

$$\beta = \frac{S}{P}$$

(11)

Among them, $\beta$ represents the connectivity of the network, $P$ represents the number of nodes, and $S$ represents the number of edges. $\beta$ is usually between 0 and 3. If $\beta > 1$, the network has the characteristic 1 of a ring network; if $0 < \beta < 1$, the network is quite dendritic; if $\beta = 0$, the nodes of the network are in an isolated form.

### 3.3. $\gamma$ Index

The $\gamma$ index is used to reflect the degree of connectivity of the spatial network, measuring the ratio between the number of observations in the spatial network and the maximum number of connections, calculated as follows:

$$\gamma = \frac{S}{3(p - 2)}$$

(12)

$\gamma$ is the network connection rate, and $S$ and $P$ have the same meaning as the $\beta$ index. If every node in the network is connected to other nodes, and the network connectivity is maximal, the upper bound of $\gamma$ is 1. If there is no connection in the network, and no node is connected, $\gamma$ takes 0 as the lower bound.

The average path represents the average distance of the shortest connections (traffic links of a given level) between a node and other nodes, 1 if there is a direct traffic link between the two nodes, or 0 if there is no direct traffic link. The lower the value of the average path, the better the accessibility. The node with the shortest average path is often the core of the destination system. The calculation method of the average path is as follows:

$$A_{ij} = \frac{\sum_{i=1}^{n} B_{ij}}{N - 1}$$

(13)

In the formula, $A_{ij}$ represents the accessibility of the point, and $B_{ij}$ represents the shortest distance from node $i$ to node $j$.

According to the book "Introduction to social network analysis" and some of my own understanding, I think that the index of overall network evaluation can be an important index to measure the compact structure of the network by the relevant indicators such as the overall density, degree center potential, and intermediary center potential of the network.

The overall network density refers to the ratio of the number of relationships actually existing in the network to the number of relationships that may exist in the network, expressed as follows:

$$\frac{p}{q/q - 1}$$

(14)

Among them, $p$ is the actual number of relations in the network, and $q$ is the number of operators in the network. The higher the network density, the more interconnected the network nodes, the denser the relationship, and the stronger the function of the network.

The degree-centric potential and the mediation-centric potential analyze the overall consistency of the network structure. The degree central potential is expressed as follows:

$$F_1 = \frac{\sum_{i=1}^{k} (F_1(n*) - F_1(n_i))}{k^2 - 3k + 2}$$

(15)

Among them, $F_1(n*)$ is the maximum degree centrality value of the network, the numerator represents the sum of the difference between the degree centrality and the maximum degree centrality of all other nodes in the network.
being evaluated, and \( k \) is the number of tourist nodes in the network. The higher the value of degree centrality, the more obvious the tendency of visitor flow to be concentrated or scattered around the central node.

The expression of the intermediate potential is as follows:

\[
F_2 = \frac{\sum_{k=1}^{n_k} (F_2(n_k) - F_2(n_i))}{k^2 - 4k^2 + 5k - 2},
\]

(16)

Among them, \( F_2(n_k) \) is the maximum betweenness value of the node being evaluated in the network, the numerator is the sum of the differences between the mediation value and the maximum mediation value of all other nodes in the network being evaluated, and \( k \) is the number of nodes. The higher the value of the intermediary center potential, the more the transportation and distribution of the tourist flow completed by one or more intermediary nodes with an important position in the network.

The research on sports tourism in the core area found that sports tourism develops rapidly, the diversity and characteristics of sports tourism projects in the region are limited, the layout of developed sports tourism destinations is relatively scattered, and the competition among sports tourism attractions is fierce. On the one hand, this is due to the excessive emphasis on local interests and short-term interests in the development of sports tourism, and the outbreak of sports tourism development has been avoided without analyzing the comparative advantages of local sports tourism resources. Among the sports tourism projects developed, popular sports tourism projects such as fishing, mountain climbing, rafting, and swimming are more popular, and the similarity effect is serious, while coastal sports tourism projects mostly focus on hunting, entertainment, and water sports. On the other hand, some scenic sports tourism destinations have tried every means to become bigger and stronger, ignoring the market and their own regional conditions. The excavation of human resources is not thorough enough, the scale is blindly compared, and the investment risk is huge.

4. Experiments on Investigation and Research on Sports Tourism Destination Activities

4.1. Cognitive Characteristics of Sports Tourism. Sports tourism can be seen as a combination of sports and tourism, where a tourist participates in a sporting activity or sees a sporting attraction that must take place during the tourist’s visit. This kind of behavior not only needs to conform to the characteristics of different places, but also needs the sports activities that tourists participate in and the environment where tourists live to have a certain tourist attraction. In order to study the residents’ awareness of sports tourism in A, 200 residents were randomly selected, including local residents and foreign residents. The specific distribution is shown in Table 1.

Market awareness of sports tourism is low. Among the respondents, there are 25 residents who know sports tourism very well, accounting for 16.7%, and 35 people who know some sports tourism, accounting for 11.7%. There are 90 people who have heard of sports tourism, accounting for 30%; 150 people, accounting for 50%, who do not know about sports tourism. It can be seen that most residents have a low awareness of sports tourism, but it is also found in the interview that although residents do not understand the academic concept of “sports tourism,” they are familiar with the activities involved in sports tourism, and they all participate in the related activities. Sports tourism has now become an important way of participating in tourism activities. Among the respondents, 22 people are willing to take sports activities as the primary purpose of travel, while 94 people will not use this as the primary purpose of travel, and the rest of the people think that it does not matter. The results show that there is a certain audience market for sports tourism, and there is a huge market development space and potential in the future.

Network media are the main channel for understanding sports tourism information. According to statistics, the channels of 150 residents who have known sports tourism to obtain sports tourism information, as shown in Table 2, the analysis shows that online media are the main channel for residents to understand sports tourism information, accounting for 46.7%, which is related to the progress of modern technology and the development of the Internet intimate relationship. Secondly, more information was communicated through relatives and friends, accounting for 23.3%. Travel agencies also assumed a part of the guiding and publicizing role, and the number of selected people accounted for 21.3%, while traditional publicity channels, such as newspapers and magazines, were in a weak position in marketing. The results show that, on the one hand, the

### Table 1: Survey respondents’ awareness of sports tourism.

<table>
<thead>
<tr>
<th></th>
<th>Females</th>
<th>Males</th>
</tr>
</thead>
<tbody>
<tr>
<td>No knowledge</td>
<td>66</td>
<td>84</td>
</tr>
<tr>
<td>Heard of it but not sure</td>
<td>44</td>
<td>46</td>
</tr>
<tr>
<td>Know a little</td>
<td>21</td>
<td>14</td>
</tr>
<tr>
<td>Very knowledgeable</td>
<td>14</td>
<td>11</td>
</tr>
</tbody>
</table>

### Table 2: Understanding the distribution of options for sports tourism channels.

<table>
<thead>
<tr>
<th>Channels</th>
<th>Frequency</th>
<th>Proportion (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Travel agency</td>
<td>32</td>
<td>21.3</td>
</tr>
<tr>
<td>Online media</td>
<td>70</td>
<td>46.7</td>
</tr>
<tr>
<td>Newspapers and magazines</td>
<td>12</td>
<td>8</td>
</tr>
<tr>
<td>Friends and family</td>
<td>35</td>
<td>23.3</td>
</tr>
<tr>
<td>Other</td>
<td>1</td>
<td>0.7</td>
</tr>
</tbody>
</table>

### Table 3: Design of preference for sports tourism types of residents of different genders.

<table>
<thead>
<tr>
<th>Types</th>
<th>Participatory</th>
<th>Ornamental</th>
</tr>
</thead>
<tbody>
<tr>
<td>Males</td>
<td>Frequency</td>
<td>Percentage</td>
</tr>
<tr>
<td></td>
<td>20</td>
<td>80%</td>
</tr>
<tr>
<td></td>
<td>Percentage</td>
<td>46%</td>
</tr>
<tr>
<td>Females</td>
<td>Frequency</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Percentage</td>
<td>20%</td>
</tr>
</tbody>
</table>


- [Network media are the main channel for understanding sports tourism information. According to statistics, the channels of 150 residents who have known sports tourism to obtain sports tourism information, as shown in Table 2, the analysis shows that online media are the main channel for residents to understand sports tourism information, accounting for 46.7%, which is related to the progress of modern technology and the development of the Internet intimate relationship. Secondly, more information was communicated through relatives and friends, accounting for 23.3%. Travel agencies also assumed a part of the guiding and publicizing role, and the number of selected people accounted for 21.3%, while traditional publicity channels, such as newspapers and magazines, were in a weak position in marketing. The results show that, on the one hand, the...](#)
publicity and marketing of sports tourism should make full use of modern technology and new media, such as increasing the publicity of sports tourism on the Internet and TV and expanding the market size and audience range. On the other hand, sports tourism destinations should be guided by market demand, and it is necessary to meet the sports tourism needs of tourists to the greatest extent and continuously improve the quality of its own services, so that tourism consumers themselves become the promoters of tourism products.

4.2. Activity Preference Characteristics of Sports Tourism. Sports tourism is a kind of tourism activities that take part in or watch sports as the main body. Among them, sports activities are the main body, which is the most significant feature of sports tourism that distinguishes it from other tourism activities. As shown in Table 3, from the overall point of view, there are more people who choose participatory sports tourism. From the perspective of the group, the overall participation of men is stronger than that of women, and men prefer participatory sports tourism. In contrast, the share of women in spectator sports tourism has risen to 54%.

5. The System Spatial Characteristics of Sports Tourism Destinations

There are differences in the choice of physical activity among residents of different ages. In order to further reflect the physical activity choice preferences of different groups, according to the nature of the above sports activities, all involved activities are classified into four types of sports activities: “leisure sports,” “physical fitness,” “stimulation and challenges,” and “event activities.” The statistical results of sports activity type preferences of residents of different ages are shown in Figure 7.

From the perspective of age distribution characteristics, people who participate in sports tourism activities are mainly between 16 and 45 years old, and the people younger than 15 years old and those older than 45 years old have a low degree of participation in sports tourism. The activity participation is the highest, and this is the dividing point, and it gradually decreases. From the perspective of the distribution of physical activity types, stimulating and challenging physical activities have become the preferred type of activity for residents and are mainly concentrated in the age group of 26–35, followed by physical activity types such as physical fitness, leisure sports, and event activities.

Figure 8 is the distribution map of residents’ choice of travel time and travel frequency within a year. Weekend tours and self-driving tours are the main travel methods for residents to participate in sports tourism. Any type of tourism needs to have residual disposable funds and ample leisure time as the basis, but leisure time is not an isolated factor, and it is inseparably linked to the space factor. Spatial and temporal factors directly affect the choice of sports tourism destinations. As shown in Figure 8, 55% of women will choose to travel on weekends to participate in sports tourism activities. For men, travel time is more evenly distributed, basically between 20% and 38%, and only 7% of residents will choose to travel on weekdays. The data shows that residents have strong demand for sports tourism in suburban areas, and weekend travel has become the normalization of tourism development, which will stimulate the
development of sports tourism projects to a certain extent. Nowadays, the road transportation system is developed, and there are various modes of transportation for travel, which is very convenient for travel.

In order to study the spatial distribution characteristics of sports tourism destination resources, the sports tourism destination resource points in place A are selected for correlation analysis. The sports tourism resource points are shown in Figure 9. The index analysis of the nearest neighbor points of different types of sports tourism destinations is shown in Figure 10.

From the types of selected resource points, it can be seen that the types of sports tourism resources in area A are rich, covering a variety of sports events, providing resource guarantee for the development of sports tourism; from the number of selected resource points. It can be seen that area A has the largest number of recreational sports tourism resources, including 124 sports park resource points, and

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**Figure 8**: Selected travel time and travel frequency distribution within one year.

**Figure 9**: Sports tourism resource point.
there are many extreme challenge projects. From this, it can also be inferred that leisure sports tourism activities are the most active types of sports activities in area A at present, while extreme challenges and physical fitness sports activities still have a large space for development. During some field investigations, it is found that the sports tourism resources participating in leisure sports are mainly local people, while nearly 40% of the people in extreme challenge and physical fitness come from other countries or regions.

In general, the nearest neighbor index $R$ of leisure sports tourism destinations is less than 1, between 0.5 and 1, and the distribution is relatively scattered. The nearest neighbor index $R$ of fitness sports tourism destinations varies from 0 to 0.5, showing a clustered distribution state. In the actual investigation, it was also found that the overall layout of physical fitness resource points is relatively scattered, in a band-like and group-like distribution pattern. This is mainly related to the main types of sports tourism, because different types of sports activities require different types of sports venues, which largely affects the spatial distribution characteristics of sports tourism destinations. The distribution of resource sites is more related to the location of rivers, which are not dependent on roads, but are located in places with underdeveloped traffic, which also has a lot to do with the nature of this sporting activity, for example, climbing and surfing. The pattern of leisure and sports tourism spots is typical, with a circular distribution around urban areas. These are activities that tourists prefer and participate in, and the allocation of resources depends more on market demand.

6. Conclusions

Data mining and data fusion are two different data processing techniques with different principles and goals. Data mining is to use induction theory to find important values, hidden patterns, and relationships in data, while data fusion is to use induction theory to supplement the application of models, create new relevant data, and improve system capabilities. In order to combine the two technologies closely into the application, it is necessary to integrate the existing research results of the two technologies and formulate a common interface specification. Despite the rapid development of sports tourism, there are also some material and social reasons that limit the further development of sports tourism. The rapid development of tourism and the continuous growth of national tourism demand have made the development of domestic tourism destinations explode. It is mainly concentrated in three types: leisure sports, extreme challenges, and physical fitness. The nearest point index $R$ of physical fitness sports tourism destinations ranges from 0 to 0.5. The people who participate in sports tourism activities are mainly between the ages of 16 and 45. In addition, it is also necessary to emphasize ecological protection and strengthen policy guidance. Sports tourism depends not only on the ecological environment, but also on the level of economic development.
Data Availability

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

Conflicts of Interest

The authors declare no conflicts of interest.

References


