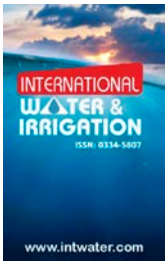

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Research on the Development and Management of Ecological Agriculture Characteristic Tourism Based on Artificial Intelligence Technology for Water Resources

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Abstract In order to improve the effectiveness of ecological agriculture tourism development and management of water resources, this article combines artificial intelligence technology to study the development and management of ecological agriculture tourism. This article conducts a hierarchical analysis based on the characteristics of tourism symbol aggregation and spatial distribution patterns within a certain period of time, determines the threshold for extracting the optimal tourism behavior boundary, and strives to solve the problems caused by the complexity and dynamism of tourism behavior. In addition, this article also developed an intelligent water resources agricultural characteristic tourism management system to improve the development effect of agricultural characteristic tourism and promote precise control of water conservancy irrigation systems in ecological agricultural tourism areas. Finally, this article combines the proposed algorithm model to construct an ecological agriculture characteristic tourism development and management system. Simulation evaluation shows that the ecological agriculture characteristic tourism development and management model based on artificial intelligence technology proposed in this paper has good effects.

Keywords: artificial intelligence; Ecological agriculture; Featured tourism; Development management, water resources.

1 INTRODUCTION

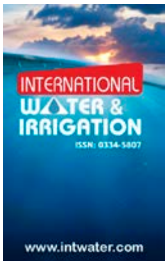
With the help of artificial intelligence technology, precise control of water conservancy and irrigation systems within ecological agricultural tourism areas can be achieved. By analyzing multi-source information such as soil moisture sensors and meteorological data, on-demand irrigation can be achieved to improve water resource utilization efficiency, ensure the good condition of agricultural production landscapes to attract tourists, and reduce water resource waste. This is particularly crucial for the development of ecological agricultural tourism in areas with relatively scarce water resources.

Artificial intelligence can help analyze the impact of changes in water conservancy conditions on aquatic organisms and surrounding ecosystems in ecological agricultural tourism areas. By adjusting water conservancy scheduling strategies to maintain the ecological balance of water bodies, such as ensuring the living environment of fish and promoting the ecological functions of wetlands, the ecological connotation of tourism can be enriched and the quality of ecological agricultural tourism can be improved.

The essence of informatization is the process of producing data, and data is mass-produced to form data resources. The data resource is a collection of physical symbols arranged and combined according to a certain rule of load or record information [1], and it can be a collection of numbers, words, images, or computer codes. The reception of information begins with the reception of data. Information can only be obtained through the interpretation of the data background. That is, data is transformed into information, which can be expressed by the formula "data + background = information" [2]. Data resources come from different companies and different social entities participating in market competition, including various market data, customer data, transaction history data, financial management data, social comprehensive data, and production research and development data. And tourism data resources are a type of application of data resources in the tourism industry. It contains data generated by different entities in the entire tourism supply chain, such as management data from tourism management departments, tourism companies, major Internet websites, tourists, tour guides, and transportation, finance and other industries [3].

Eco-agricultural tourism is not only the most vital tourism industry in my country, but also the main content of the structural adjustment of my country's tourism industry under the new situation. It represents and reflects the inherent requirements of sustainable development of my country's tourism industry. Good development, first of all, we need to start from the aspect of government management of eco-agricultural tourism. Judging from the current research on eco-agricultural tourism management in my country, it is more limited to theoretical research and lacks effective research in practice. In the context of marketization, driven by interests, some tourism enterprises often engage in non-ecological agricultural tourism activities under the banner of eco-agricultural tourism or activities that go against the development concept of eco-agricultural tourism industry. From another point of view, enterprises that are really engaged in the management and service of eco-agricultural tourism, due to the lack of correct thinking as guidance, the lack of professional eco-agricultural tourism management talents, the lack of scientific knowledge and advanced skills as a guarantee, the corresponding It makes the management and development of eco-agricultural tourism a mere formality. The ecological and environmental protection of agriculture has reached a bottleneck stage. The expansion of the scale of eco-agricultural tourism has brought greater challenges to the regional environmental carrying capacity. The extensive tourism development model has brought a greater negative impact on the agro-ecological environment. . This is not only not conducive to the improvement of agro-ecological agricultural tourism management and service level, but also has an adverse impact on the sustainable and healthy development of the agricultural economy.

This article combines artificial intelligence technology to study the development and management of eco-agricultural characteristic tourism, and formulates an intelligent agricultural characteristic tourism management system to enhance the development effect of agricultural characteristic tourism.

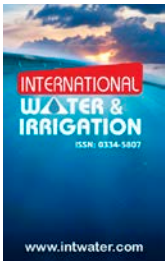


2 RELATED WORK

Literature [4] pointed out that ecotourism is "travels in the undisturbed or polluted sky-eye area for the purpose of researching or sightseeing the natural scenery, wild resources and past or existing civilization phenomena; Literature [5] proposes that people recognize To the extent that tourism and the environment are closely related, the importance of maintaining the quality of the ecotourism environment and continuously monitoring environmental issues is emphasized, however, some government planners and tourism officials lack sufficient learning and experience, resulting in negative environmental impacts; ref. [6]] pointed out that ecotourism is usually established in protected natural environment reserves or remote areas with scenic ecological sites and cultural monuments, which are established to protect biological diversity and prevent the loss of natural ecosystems. It can only be sustainable under natural and cultural conditions, and it is particularly important to enhance environmental protection awareness and stimulate tourists' enthusiasm and actions to protect the environment; Literature [7] pointed out that the international support for ecotourism development is increasing day by day, and the administrative management of ecotourism is more important. The measures are also improving day by day. Foreign governments attach great importance to the development and management of the ecotourism industry, and there are many different types of ecotourism certification systems abroad.

Ecotourism management refers to the management and decision-making of ecological protection of natural scenic areas or other scenic areas under the guidance of ecological management ideas. Ecotourism management is first to solve the contradiction between man and nature, and to avoid the damage to the ecological environment caused by the overheating of ecotourism development. It is to unify economic benefits, ecological benefits and social benefits, so that both economic benefits and ecological benefits can achieve Pareto optimality, which is an important topic in the public management of ecotourism [8]. The ultimate purpose of ecotourism management is to provide tourists with high-quality ecotourism products and services, to protect the biodiversity, ecological stability and ecotourism service functions of ecotourism scenic spots, and to protect the ecosystems of ecotourism scenic spots from human damage and damage. interference. Because an ecosystem is a combination of biological elements and environmental elements in a specific space [9]. Therefore, in essence, ecotourism management is the effective management of environmental elements and their corresponding biological elements.

Literature [10] believes that the ownership of ecotourism management should be owned by the state in essence, but due to the ambiguity in the definition of responsibilities and content of ownership, management rights and managers themselves, the management of ecotourism ownership is weakened accordingly. Under the guidance of stakeholder theory, public management theory and sustainable development theory, and combined with the relevant experience of tourism management and development, the literature [11] comprehensively carried out a comprehensive analysis of the content and issues related to the management and development of ecotourism resource development. The discussion has laid a good foundation for the development of ecotourism resources and government management research; Literature [12]



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pointed out that in the management of ecotourism, the relevant environmental policy tools were not used in place, resulting in most tourists unaware of protecting the ecological environment. The importance of eco-tourism cannot play its positive educational role; Literature [13] believes that in the process of eco-tourism management, the government's management of eco-tourism scenic spots cooperates and influences each other, that is, the government effectively manages eco-tourism scenic spots. It is conducive to the sustainable use of resources, has a positive effect on the protection and promotion of our national culture, and can improve the on-site experience of tourists; Literature [14] emphasizes that with the rapid development of urbanization today, the importance of ecotourism management is becoming more and more important. The more important it is, but from the current ecological tourism management point of view, there are generally problems such as imperfect scenic spot management mechanism, low comprehensive quality level of management personnel, and no distinction between government and enterprise, which is very unfavorable to the development of ecological tourism management. Literature [15] emphasizes that the government plays an important role in strengthening regional ecotourism management, and proposes countermeasures and suggestions to promote ecotourism management and service levels from the aspects of strengthening macro-control, highlighting government public service functions and strengthening supervision; Literature [16] emphasizes that the development of ecotourism management requires innovation in the concept of development first, looks at ecotourism management from the perspective of development, and drives the innovation of ecotourism management models through innovation-driven development, so as to further improve the management and services of ecotourism scenic spots. Literature [17] believes that the development of ecotourism management is inseparable from the concerted efforts of the government and local communities, and proposes targeted countermeasures from policy management, community management, environmental management and other aspects to promote the level of ecological management in scenic spots Literature [18] pointed out that in the process of ecotourism management, government departments make the promotion of its construction more legalized and standardized on the basis of comprehensive planning, perfecting legislation, doing a good job in publicity and education, and strengthening personnel training; literature [19] analyzed the connotation of the eco-tourism management system, and proposed a series of strategies for the optimization of eco-tourism administrative management, including the government-led update of management concepts, innovation of management knowledge, the use of information technology to create information platforms, and the establishment and improvement of eco-tourism. management system, innovative scenic spot management mode, etc.

3 AGRICULTURAL ECOLOGICAL CHARACTERISTIC TOURISM MODEL BASED ON ARTIFICIAL INTELLIGENCE TECHNOLOGY

The "Hie-Density" model draws on the idea of circle structure, analyzes the hierarchical expansion based on the characteristics of visitor check-in and spatial distribution within a certain period of time, and extracts the optimal tourist behavior boundary by recognition threshold. It is committed to solving the problems of poor fit of traditional tourist activity boundary characterization methods caused by the complexity and dynamics of tourist behavior, difficulty in threshold recognition, lack of spatial element correlation and related geographic theoretical basis. As shown in Figure 1, the "Hie-Density" model construction process is mainly divided into five parts.

Figure 1 Conceptual diagram of "Hie-Density" theoretical model

The characteristics of tourist distribution and agglomeration have temporal and spatial dynamics, and the migration process of the center of tourist activity space reflects the changes in the attraction intensity of various tourist elements. The density of Weibo check-in data near tourist hotspots will be significantly higher than other places. Kernel Density Estimation (KDE) is a method to solve the distribution density function of a given sample set. It conforms to the first law of geography and takes into account the effect of distance attenuation between entities. Its characteristic is that the closer the distance to the core element, the greater the density of the kernel. The density function is expressed as:

$$f_h(\mathrm{p}) = \sum_{i=1}^{n} \frac{1}{nh^2} k\left(\frac{p-p_i}{h}\right) \quad (1)$$

In the formula, $fh(p)$ is the density estimation function of space p, h is the kernel density estimation bandwidth (also known as smoothing parameter or window width), n n represents the number of spatial entities whose distance from the position p is less than h, and the $k(\cdot)$ function represents the kernel probability density function, and the standard Gaussian kernel function with a variance of $\sigma 2$ is usually used. The choice of bandwidth h has a key influence on the results of

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nuclear density analysis. It is more reasonable for the bandwidth value to express the data space aggregation within a certain range.

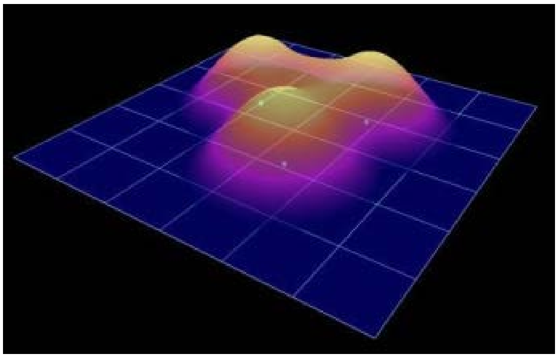

Figure 2 Kernel density estimation of point elements

The theory of spatial data field believes that within a certain range, there is a virtual physical field between spatial entities, and the entities are connected to each other through the cohesion generated by this physical field. Spatial clustering is an important means of geographic data mining and analysis. The definition of the spatial proximity relationship between entities is the core issue of spatial clustering. Delaunay triangulation has proven to be a powerful tool for proximity analysis and proximity calculation of spatial entities. At present, the hierarchical clustering algorithm based on Delaunay triangulation is mainly used for the division of image or graph clusters. This research improves the hierarchical clustering algorithm and uses it to construct the tourist sign-in relationship network.

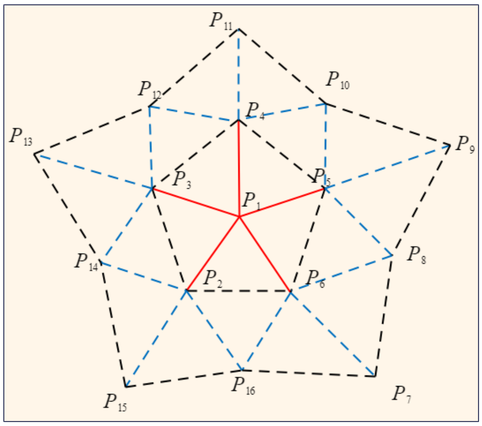

Figure 3 Conceptual diagram of tourist sign-in relationship network

Spatial distance is the basis for characterizing the strength of contact between different tourist locations. In order to best fit the distribution of tourists, it can be considered that a check-in point

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in the triangle network has a strong interaction with the point directly adjacent to it. This effect is manifested in the degree of aggregation of adjacent spatial distribution. In the Delaunay triangle network, the strength of contact between tourists will decrease as the total length of the shortest path between the two points along the triangle network side increases. As shown in Figure 3, the tourists directly adjacent to the tourist p1 are p2, p3, p4, p5, and p6, and the path between them is indicated by a red line. Therefore, the cohesion between p1 and these tourists is stronger. However, P1 is farther to reach other points, so the connection between them is weaker.

In the original Delaunay triangulation, the entire area showed the characteristics of the Delaunay triangulation being too expanded (Figure 4a). Therefore, it is necessary to delete the excessively long edges from the Delaunay triangulation, that is, delete the weaker edges between the check-in data points (Figure 4b). The basic idea of the ASCDT algorithm is to define a side length threshold standard. If the distance between two check-in points is less than the threshold, this side is retained. Otherwise, it is considered that the connection between the two sign-in data points is weak, and this side is deleted. As a whole, it eliminates the weak connection side of the tourist sign-in space. If we take a check-in point pi in the tourist check-in point set P as the starting point, the deletion threshold of the edge adjacent to pi is defined as:

$$Cut\_Value(\mathrm{p_i}) = \mu(\frac{Mean(\mathrm{p})}{Mean(\mathrm{p_i})}\mathrm{Std}(\mathrm{p}) + \mathrm{Mean}(\mathrm{p})) \quad (2)$$

Among them, the average of all side lengths in the original triangulation is recorded as $Mean(P)$, and the average of the side lengths directly adjacent to pi is recorded as $Mean(pi)$. In order to achieve a more flexible and reasonable coverage of the tourist activity space, this paper introduces a scale factor μ to adapt to different spatial scales and the accuracy of the extraction results. Moreover, its general value range is 0.5-3.5. In this study, the standard scale factor μ value is set to 1.0, and $Std\ (P)$ represents the standard deviation of the side length of the triangle, which is defined as:

$$std(\mathrm{p}) = \sqrt{\frac{\sum_{i=1}^{N}(\mathrm{Mean}(\mathrm{p}) - |e_i|^2)}{N}} \quad (3)$$

In the formula, $|ei|$ represents the length of the i-th side of the triangulation network, and N is the number of sides of the triangulation network. In the Weibo check-in set p, if the length of the j-th edge in the line segment set directly connected to a check-in point pi $|ej|$ exceeds the deletion threshold, this edge belongs to the global too long edge and is deleted. The overall long side (weakly connected side) is expressed as:

$$Weak\_Edges(\mathrm{p_i}) = \left\{ e_j \middle| |e_j| \geq Cut\_Value(\mathrm{p_i}) \right\} \quad (4)$$

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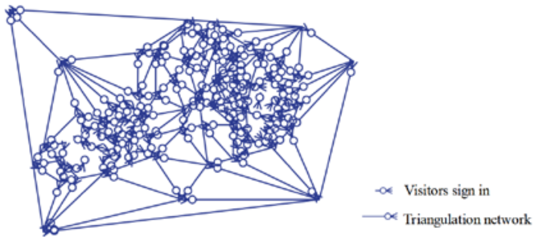
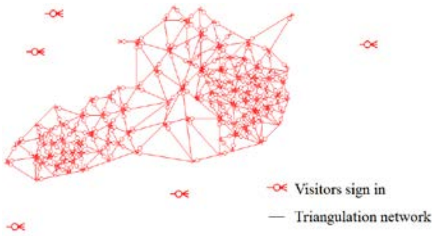
If the length of the j-th edge of the edge directly connected to the point pi $|ej|$ is less than the deletion threshold, then $|ej|$ is a strong connection edge, and these edges are reserved, expressed as:

$$Strong\_Edges(p_i) = \left\{ e_j \middle| \left| e_j \right| \leq Cut\_Value(p_i) \right\} \quad (5)$$



(a) The original delaunay triangle network



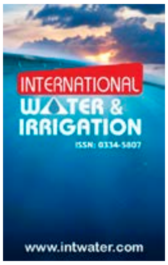
(b) Optimized triangle network

Figure 4 Triangulation network optimized based on ASCDT algorithm

In this paper, Delaunay triangulation network is used to construct the neighboring relationship network of tourists, and the triangulation network is processed based on ASCDT to eliminate the global excessively long edge. The use of optimized triangulation instead of point elements for kernel density estimation weakens the influence of spatial agglomeration and bandwidth accumulation on boundary expansion, and solves the problem of morphological distortion and ignoring discrete distribution areas. Moreover, the coupling expression of the actual activity space of tourists is better than the traditional point core density. The kernel density estimation bandwidth in this paper adopts the optimal search bandwidth strategy of ArcGIS10.5 platform for self-adaptation:

$$h_{adapt} = 0.9 \min\left(L_m \sqrt{\frac{1}{\ln(2)}}, D \right) \left(\frac{1}{n} \right)^{0.2} \quad (6)$$

In the formula, Lm represents the median distance between the average center and all check-in points, where the average center coordinate is the average of all data point coordinates. D represents the standard deviation of the distance between the average center and the check-in point, MIN(a, b) represents the smaller value of a and b, and n is the total amount of data.



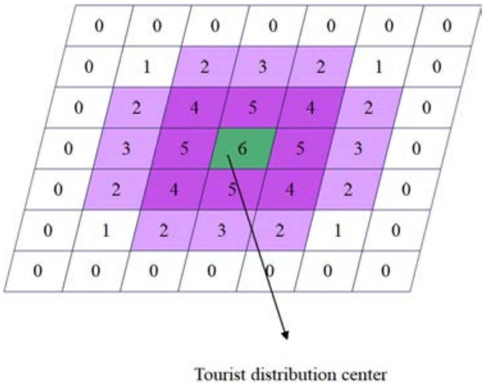


Figure 5 Schematic diagram of tourist distribution center

The core density can reflect the spatial distribution and density characteristics of tourists, and the peak density of the local area presented by it represents the location where tourists are most closely connected and have the highest concentration in this area. The tourist distribution center is formed, which is similar to the topographical elements of the "mountain apex" in geography, that is, the point of maximum elevation in a local area. The tourist distribution center takes the point-like element as the form of existence, which is essentially an abstract representation of the geographic spatial density distribution "mountain apex". The core density value at this location is significantly higher than the surrounding area. Therefore, according to this characteristic, the tourist distribution center is identified. The tourist distribution center diagram is shown in Figure 5.

Population is an important indicator to define the entropy model. Moreover, we assume that the entire system is divided into n regions, and pi is the ratio of the number of tourists in sub-region i to the total number. The entropy model is defined as:

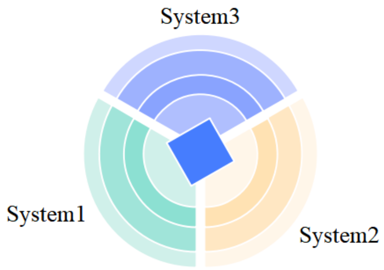
$$H_n = -\sum_{i=1}^{n} p_i \log(\mathrm{p_i}) \quad (7)$$

In this paper, by analyzing the law of expansion and change of each element, the tourism circle system is deduced into multiple stages, as shown in Figure 6a. System 1 represents a system with uniform expansion of the circle boundary, and system 2 and system 3 have a certain concentration and radiate outwards around the core area. Among them, the concentration of system 3 is greater than that of system 2. Based on the agglomeration and evolution process of the tourism activity circle system, this paper analyzes the change characteristics of each geographic element as the circle expands:

(1) Circumferential expansion feature (Figure 6b): The area of the E-level sphere boundary is SE, which represents the expansion radius of the E-level boundary. When the nuclear density contour changes from dense to sparse, that is, when the circle boundary set L(E) changes from the first

level to the Nth level, the expansion radius $\sqrt{s_E}$ gradually increases. If the ring system expands uniformly (system 1), the expansion radius growth rate is a fixed value, the expansion radius change curve is a straight line (l_1), and the entire ring system is a concentric circle structure separated by equal distances. The actual circle system has the radiation characteristic of "core-periphery". As $\sqrt{s_E}$ increases continuously with the expansion of the circle, its growth rate is also increasing, and the curve shows a "Lorentz curve"-like growth. Under the circumstance that the scale of the entire tourist behavior space system remains unchanged, if tourists continue to gather in the core area of the circle, the circle system will converge inward and the edge diffusion speed will increase. That is, system 2 evolves to system 3, and the curve of expansion radius $\sqrt{s_E}$ gradually protrudes to the lower right on the coordinate axis, and the curve as a whole is closer to the horizontal axis of the coordinate (l_2 to l_3).

(2) The circle boundary contains the characteristics of the change in the number of check-ins (Figure 6c): By observing the changes in the number of check-ins M(E) included in the boundaries of each circle, it is found that as the circle boundaries continue to expand, the number of check-ins in the boundary increases. However, the growth rate has continued to slow down, the growth rate of sign-in volume has decreased significantly, and the M(E) curve has a significant inflection point. The increase in the concentration of the entire circle system will cause the check-in number M(E) curve to move to the upper left of the coordinate system (m_2 to m_3). When all tourist check-ins are concentrated in the core area of the circle system, the system concentration will reach the maximum. During the evolution of System 1 to System 3, tourists continued to flow into the center of tourism activities. Therefore, the polarization of the core area became more and more obvious, the peripheral tourists became sparser, and the system is in an unbalanced state.



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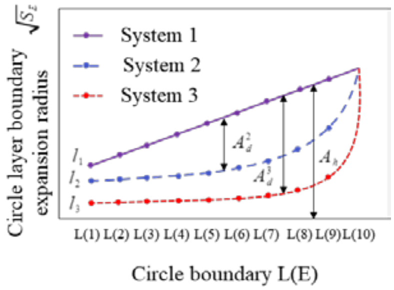

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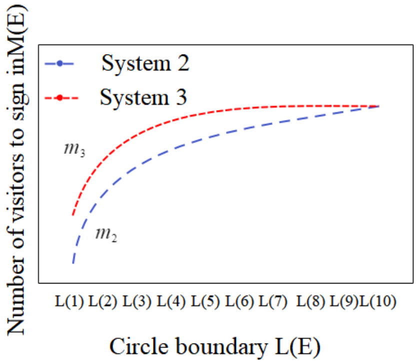

(C)

Figure 6 The change curve of the circle layer system of each geographic element with different agglomeration modes (the circle layer boundary expansion radius (b), the number of tourists check-in (c))

This paper proposes a new method "Hie-Density" based on LBS data to extract the boundary of tourist activity space. The basic idea is to define the spatial utilization to indicate the spatial utilization of the distribution of tourists within the boundaries of each level, reflecting the level of intensive tourism activities, and to calculate the spatial utilization of the boundaries at all levels through the model. The place where the first derivative of the "Hie-Density" curve is 0 is the mutation point of the tourist distribution concentration and divergence. Therefore, it takes the peak value (or extreme value) of the space utilization as the identification threshold, and the corresponding boundary is the optimal boundary of the tourist activity space, as shown in Figure 7.

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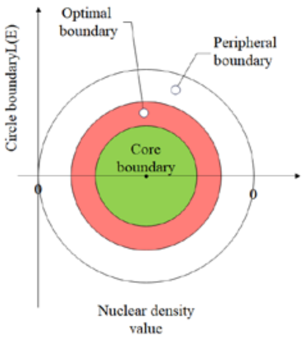

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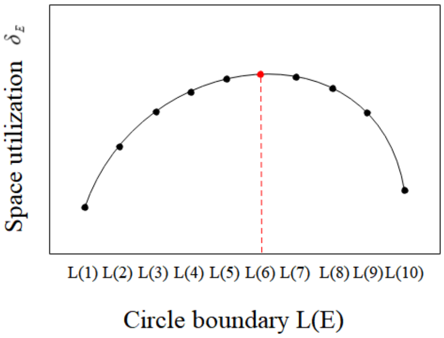


(b)

Figure 7 Conceptual diagram of circle layer boundary (a) and "Hie-Density" curve (b)

Space utilization is the output value calculated by the "Hie-Density" model, and there are differences in magnitude and dimension due to the scale of the scenic spot and the number of tourists. Therefore, each parameter is dimensionlessly processed: R_E represents the proportion of the expansion radius $\sqrt{s_E}$ of the E-level circle to the maximum radius $\sqrt{S_{10}}$; M_E stands for the percentage of tourists included in the boundary of the E-level circle to the total number of tourists. The gravity model points out that the spatial distribution of population and economic activities in geographic space gradually decreases from the center to the periphery. Population density and distance have a negative exponential function correlation (1/exp(·)). Edwards et al. introduced the exponential function type of distance attenuation model into the tourism model earlier, and discovered the model relationship based on this reference. Then, the space utilization of the E-level circle layer boundary is defined as:

$$\delta_E = \lambda\left(\frac{M_E}{\exp(\mathrm{R_E})}\right) \quad (8)$$

In the formula, λ represents the aggregation coefficient, which is used to identify the distribution pattern and aggregation state of tourists, and λ is defined as:

$$\lambda = \frac{c}{(H_n + 1)} \quad (9)$$

H_n represents the entropy of tourist distribution, which is used to describe the equilibrium degree of tourist spatial distribution. As shown in Figure7b, in the same area, A_d represents the area enclosed by the ideal expansion radius uniform change curve l_1 and the actual curve l_n, A_h represents the area enclosed by the curve l_1 and the horizontal axis of the coordinate. Then, c is expressed as A_d/A_h, and the higher the overall concentration of tourists, the greater the value of c. c can be converted into integral form for calculation:

$$c = \frac{\int_1^E (l_1 - l_h)\, d}{\int_1^E (l1) dE} \quad (10)$$

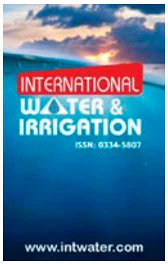
The calculation shows that when the entire system is uniformly expanded, the value of λ is 0. The more balanced the space system, the smaller the value of λ. The higher the degree of system aggregation, the greater the value of λ.

This article analyzes the evolution mode of the circle structure of different types of tourism systems.

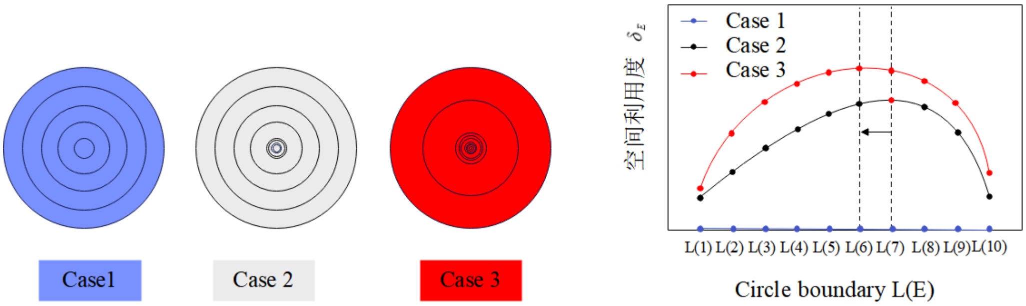
The theoretical model of single-center structure evolution (Figure 8a).

There is only one density center in the whole system macroscopically. When tourist activities show a homogeneous expansion pattern (Case1), the growth rate of theoretical boundary expansion radius $\sqrt{s_E}$ is a fixed value. It is calculated that the value of c and the aggregation coefficient λ are both zero. Therefore, the space utilization δ_E of the boundary of each level is equal to 0, and the "Hie-Density" curve is a straight line that is always 0. When the system is in a certain state of aggregation, the theoretical boundary spreads from the core area to the periphery. According to the definition of H_n, there is only one spatial unit after the division of the single-core circle system, so the value of H_n is 0. On the premise that the system scale (the total area of the system and the total number of tourists) remains unchanged, as the spatial distribution of tourists in the region increases (Case2 to Case3), the maximum value of the curve of space utilization δ_E rises. The "Hie-Density" curve will focus on the maximum value, and the degree of curve will increase, reflecting the characteristics of spatial hierarchy and centripetal concentration of tourist activity distribution. At this time, the optimal boundary is closer to the core layer.

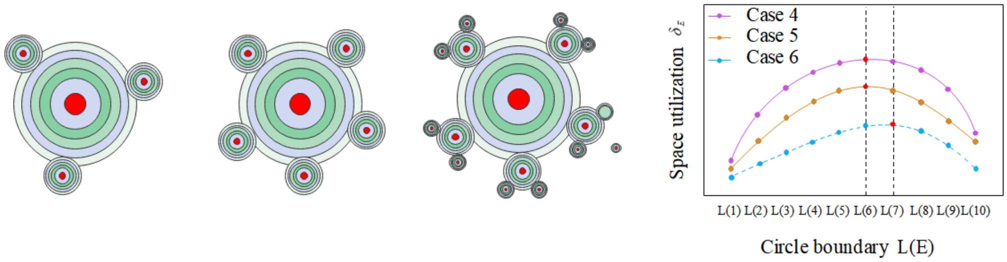
(2) Theoretical model of multi-center structure evolution (Figure 8b)



The tourism circle system is a spatial organization of dynamic expansion and development. When there are more tourist attractions supporting tourism activities in the tourist area, the system generates multiple density centers. As the space carrier of the small-scale tourism system, scenic spots have formed multiple tourist hotspots in the continuous development. When the circle center expands outward by a certain increment, as the number of system centers increases, the original system gradually develops in a more balanced direction. The entropy of tourist distribution increases and the value of c decreases. Therefore, the value of the agglomeration coefficient λ decreases, the "Hie-Density" curve decreases as a whole, and the maximum value of the space utilization δ_E decreases. If the number of tourists gathering centers in the system continues to increase, the threshold point corresponding to the extreme value of the "Hie-Density" curve may shift to the right, and the optimal boundary is closer to the outer circle.



(a) Concept diagram of the evolution of the single-core circle structure and the "Hic-Density" curve



(b) Concept diagram of the multi-core circle structure evolution and the "Hic-Density" curve

Figure 8 Analysis of the evolution mode of different circle structure based on the "Hie-Density" model

Table 1 Comparison of model parameters under different system evolution modes

Evolution mode	H_n	λ	$MAX(\delta_E)$

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Homogeneous structure	$H_n^{case1} = 0$	$\lambda^{case1} = 0$	$\delta_E^{case1} = 0$
Single core structure	$H_n^{case2} = H_n^{case3} = 0$	$\lambda^{case2} < \lambda^{case3}$	$\delta_E^{case2} < \delta_E^{case3}$
Multi-core structure	$H_n^{case4} < H_n^{case5} < H_n^{case6}$	$\lambda^{case4} > \lambda^{case5} > \lambda^{case6}$	$\delta_E^{case4} > \delta_E^{case5} > \delta_E^{case6}$

Note: Hn represents the entropy of tourist distribution, λ represents the clustering coefficient, and $MAX(\delta_E)$ represents the peak space utilization.

Table 1 shows the comparison of model parameters under different system evolution modes. The interaction of the circle subsystems promotes the continuous evolution of the main system, and the increase in the number of system centers indicates that the distribution of tourist check-in activities is more discrete, forming a tourism cluster with complex spatial differentiation and a more balanced distribution. The decrease in the number of system centers indicates that the distribution of tourists is more concentrated, the geographical elements in the system are converging to the core area, the expansion of the circle system is more convergent, and the spatial structure is more unified.

4 RESEARCH ON THE CHARACTERISTIC TOURISM DEVELOPMENT MANAGEMENT SYSTEM BASED ON ARTIFICIAL INTELLIGENCE TECHNOLOGY

This paper combines the algorithm model proposed in the previous article to construct an eco-agricultural characteristic tourism development management system, and its structure is shown in Figure 9.

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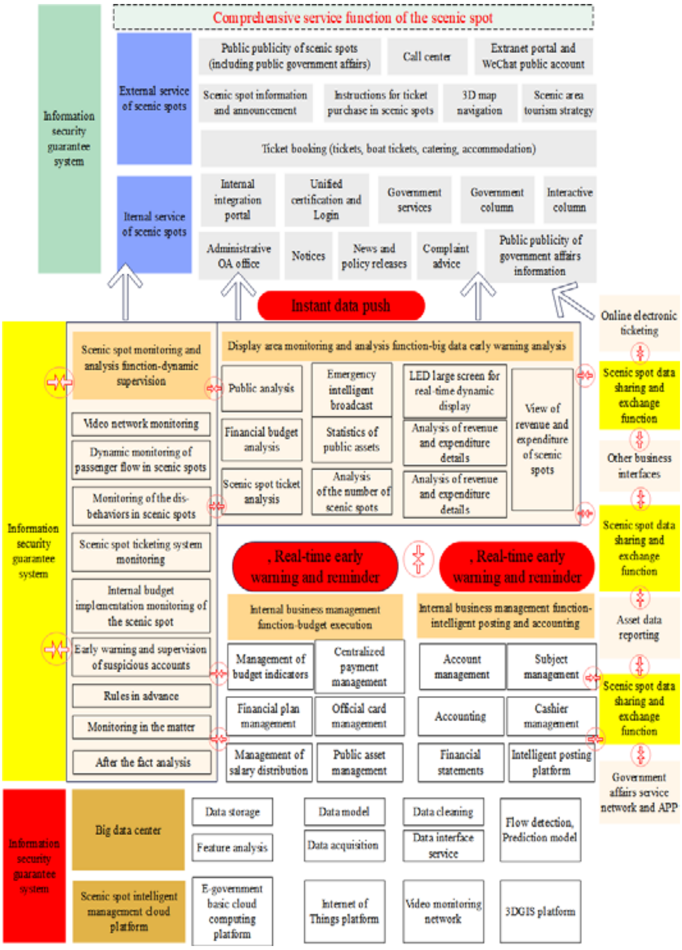

Figure 9 Eco-agricultural characteristic tourism development management system based on artificial intelligence technology

On the basis of the above research, the effect evaluation of the eco-agricultural characteristic tourism development management model proposed in this paper is carried out, and the simulation result shown in Figure 10 is obtained. The simulation area shown in Figure 10 is a certain agricultural tourism park, where the dots represent the tourists in the activity, and the various colors represent the scenic spots.

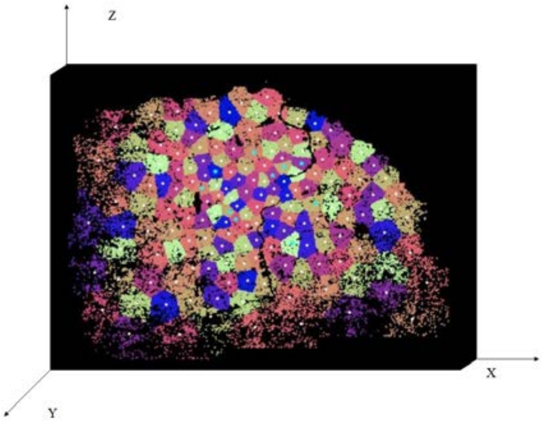

Figure 10 Simulation diagram of eco-agricultural characteristic tourism development management

On the basis of the above research, the effect of the model in this paper is evaluated, and the results of the statistical evaluation are obtained, and the results shown in Table 2 are obtained.

Table 2 Evaluation of the effect of the development management model of ecological agriculture characteristic tourism based on artificial intelligence technology

Number	Evaluation	Number	Evaluation	Number	Evaluation
1	87.38	25	89.02	49	84.29
2	89.55	26	75.51	50	76.65
3	80.60	27	89.55	51	80.93
4	76.08	28	76.97	52	81.91
5	85.33	29	80.74	53	75.31
6	84.61	30	90.69	54	78.82
7	80.31	31	87.94	55	83.56
8	75.46	32	86.61	56	79.06
9	83.20	33	80.05	57	76.53
10	84.54	34	81.41	58	88.85
11	90.03	35	78.54	59	85.33
12	90.50	36	76.76	60	88.17

13	84.46	37	82.17	61	84.91
14	88.29	38	83.87	62	76.20
15	80.03	39	77.57	63	87.69
16	87.89	40	78.47	64	82.34
17	89.24	41	90.24	65	86.07
18	79.65	42	76.79	66	77.17
19	89.77	43	85.88	67	85.30
20	86.70	44	81.90	68	83.04
21	76.66	45	89.10	69	89.16
22	85.32	46	76.26	70	80.41
23	89.51	47	84.52	71	82.47
24	84.50	48	89.70	72	87.94

It can be seen from Table 2 above that the eco-agricultural characteristic tourism development management model based on artificial intelligence technology proposed in this paper has good results.

5 CONCLUSION

The purpose of tourism data resource management is to formulate unified data collection standards, collect, catalog and classify data, and realize the classification and archiving of tourism data. It authorizes external applications, supports main systems, breaks information islands, forms data standards and tourism data assets in the tourism industry, and then conducts various mining and use on this basis to assist various decision-making. While introducing big data analysis technology, attention should be paid to the integration with the original information resource management to maximize the use of internal resources to mine the value of information. This article combines artificial intelligence technology to study the development and management of eco-agricultural characteristic tourism, and formulates an intelligent agricultural characteristic tourism management system to enhance the development effect of agricultural characteristic tourism. The simulation evaluation shows that the eco-agricultural characteristic tourism development management model based on artificial intelligence technology proposed in this paper has good results

In the future, artificial intelligence will have the following trends in the combination of ecological agriculture, characteristic tourism, and water conservancy. One is more intelligent irrigation management, which precisely regulates irrigation based on complex data, achieving efficient utilization of water resources and landscape maintenance. The second is the automation of monitoring and maintenance of water conservancy facilities, utilizing intelligent sensors and algorithms for real-time monitoring, accurate warning, and scientific maintenance. The third is to strengthen water ecological protection and optimize restoration plans through precise analysis. The fourth is to enhance the tourism experience and safety guarantee, such as intelligent tour guides and disaster warning. The fifth is to promote deep integration of industries, break down information barriers, build a multi-party collaborative management model, and promote integrated development.

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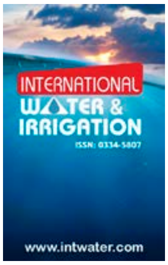

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