# Optimization of Cold Landscape Routes Based on GIS Technology - Promoting Economic Development in Ice and Snow Regions

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**Abstract:**

Cultural tourism design in cold landscapes should be the focus of attention in the future. With the increasing number of cultural buildings in cold regions, this paper makes an in-depth study on this urgent problem. With people's desire for a healthy life, people's love for natural scenery and climbing is getting stronger and stronger. Mountain scenery has gradually become a favorite tourist destination in people's spare time. With the advent of big data, geographic information system technology can effectively solve the complex and unique problems in Hanshan scenic spot with its powerful spatial analysis function and data processing ability. In this paper, the geographic information system technology is used to make an in-depth analysis of the differences in the height and time of the scenic spots. It calculates the weight of different influencing factors reasonably, and finally provides the best cold and scenic routes for different types of people to climb mountains, keep fit and pilgrimage.

**Keywords:** GIS; Route optimization; cold landscape; Cultural attractions

## 1 INTRODUCTION

At present, the theoretical development and practical construction of scenic spots in cold regions are developing at a high speed. The long development has formed a trend of perfect the management organization and a clearer development system, and the standard of route planning in scenic spots in cold regions are unparalleled. However, due to the spatial complexity of scenic spots in the actual planning process, there are still some questionable problems, such as insufficient pre-planning and subjective planning, which are obstacles to the healthy development of scenic spots. Walking trail, an important tour route in the scenic area, is the carrier connecting people and scenery. Reasonable route optimization design can realize the harmony and unity of people and scenery, that is, protect the environment and bring natural enjoyment to human beings, which has become the main purpose of today's scenic area planning [5].

By reading a large number of literature related to this study, including forest park route selection research, mountain scenic area planning research, trail system research, factors affecting mountain scenic areas research, ecological planning design, mountaineering levels, mountaineering behavior and other related literature, GIS technology is applied to route selection, and the essence of the existing research is extracted and summarized and classified as the basis of research. Geographic information system can be used for the design of geographic routes, and the location, time and attribute information in geographic data can be analyzed and studied. The research of cold landscape route planning needs comprehensive reserch with these information [6]. Using GIS technology under the guidance of location theory, the route planning of scenic spots in cold regions can: grasp the overall macro position of the study area and establish the relationship between location and place, that is, the benign interaction between the scenic spots and the city; Grasp the elements closely related to the geographical location, such as the location of scenic spots, land use combination and the functional zoning closely related to the geographical location [7]. In this paper, the optimization of landscape routes in cold regions was discussed in depth by using GIS technology, and different reasonable plans were made for the tourist routes of different demand groups, and good experimental results were achieved.

## 2 RELATED WORK
### 2.1 The connotation of the cold landscape

As part of the larger cultural concept, culture in cold landscapes is bound to be restricted and limited by traditional cultural architectural concepts and practices. For the design of cultural architecture in cold landscapes, it is necessary to inherit the original excellent concepts and practices, while at the same time pay attention to innovation and fully consider and analyze the local natural environment and historical culture. Combining the

evolutionary trend of the cultural architecture form in the current stage of cold landscapes and the main factors affecting the design of cultural architecture, this subsection will take the deep motivation of the generation of cultural architecture form in cold landscapes, the evolutionary history of cultural architecture in cold landscapes, and the characteristics of cultural architecture form design in cold landscapes as the entry point to lay an important theoretical basis for the current study of cultural architecture form in cold landscapes, through the The basic features of the design of cultural architecture in cold landscapes are analyzed through an in-depth study of the development trend of the design of cultural architecture in cold landscapes at the present stage and the internal causes of the evolution of the form, as the cornerstone of this paper's research on cold landscape routes.

(1) Display of emotional media

Japanese architecture is at the top level in this area, and architects gradually pay attention to linking art with nature and unifying natural art with artificial art in the design process. In practice, Japanese architecture is more inclined to choose a good ecological environment in the process of site selection. From the characteristics of this architecture, the main expression is the effective combination with the local natural ecological environment. To some extent, this also reflects the characteristics of maintaining coordination and unity between architecture and environment from the side. From the perspective of China's social development process, the practice and exploration of several generations of architects have led to significant progress in the field of cultural architecture in China. At the same time, a series of cultural buildings were designed and completed during this period, and the cultural buildings were linked to the landscape, and the natural areas were brought back to a vigorous life by the role of cultural buildings. Also in this process, the natural sentiment of the local area is fully displayed, making people have a deep understanding of the historical and cultural connotation of the area. In this context, the unification of the natural environment and culture has gained the focus of people's attention. Architecture survives and develops under the support of natural environment, and links humanistic life and natural landscape under the role of architecture, realizing the harmony and unity of nature and humanity.



(a) Dadiwan Museum        (b) Hongshan Museum

**Figure 1** Cold Land Landscape Museum

With the role of cultural architecture in the cold landscape, the historical culture in the natural environment has been deeply excavated, making the scenic areas gradually forgotten by the world revive vigorously and providing an important carrier for people's spiritual life. Due to the emergence of cultural architecture, the natural environment and culture in the region have become closely linked, and at the same time, people's spiritual life and the spirit of nature are maintained in harmony and unity, realizing the benign interaction between people's behavior and natural activities.

(2) Historical expression carrier

China has a long history, and the process of cultural transmission has been going on for thousands of years, and the same is true for architecture. The China Water Conservancy Museum in Hangzhou, for example, has inherited the traditional Chinese architectural form of the "tower". In addition, the location of the building has led to a certain degree of adjustment and change in the role and function of the building. In addition, the combination of modern materials and traditional architectural forms in the construction process makes the traditional elements of the building show the characteristics of diversity and adaptability, which is also the architect's inheritance and

promotion of traditional architecture. The museum building form presents diversified characteristics, which is both a reflection of the regional environment and a manifestation of the unique charm of the theme culture.



**Figure 2** China Water Conservancy Museum

The thematic creation of cultural architecture in cold landscapes will no longer be limited to symbolic imitation, but should integrate the context in the region with the architecture. The cultural architecture of the scenic area is not limited to presenting the history and culture of the region through symbolic imitation, but focuses on natural contexts and keeps an open attitude to bring out the characteristics of the theme creation fully.

(3) Functional and versatile space

With the advancement of social process and the continuous development of culture, it makes people gradually pay attention to the consideration and analysis of the spatial form of cultural architecture. Its concern even goes beyond the figurative function. Spatial display, as the key of the whole cultural architecture design, mainly plays the role of communicating people and culture. Usually, the "historical value" and "humanistic value" contained in the scenic area are mostly displayed under the support of the cultural architecture space, and in this process, it causes emotional resonance with people. At the same time, we have to seriously consider and analyze the individual characteristics of history and culture. The display of the above-mentioned content is also inseparable from the support of architectural space.



**Figure 3** Finnish Lapland Forest Museum

From the above-mentioned content can be found, the development of the current stage on the cold zone cultural architecture space has been significantly transformed, no longer limited to the previous single form of spatial expression, under the promotion of diversified forms of spatial expression can promote the further broadening of the form of natural scenic cultural architectural experience, while gradually reflecting the characteristics of spatial interest and flexibility.

**2.2 The Causes of the Formation of Cultural Buildings on the Scenic Route in Cold Regions**

(1) Nature leads the way

In the process of urban development, one of the important driving forces is the industrial element. However, for urban residents who have been in urban space for a long time, the pressure of urban life has made them yearn for the tranquility and leisure of nature. The composition of nature does not only contain rich natural scenery, but also rich historical culture and relics after a long period of accumulation and precipitation, thus adding to a certain extent to the mystery of the landscape. In this background, people in the cultural architecture design process began to combine with the natural environment, not only to let people fully feel the natural scenery at the same time also deepen the understanding of the cultural heritage, cultural architecture as an important expression of the culture of the landscape, the building should not only reflect the personalized characteristics, but also to ensure that they

fit with the natural environment, architects in the initial design process should realize the harmony of architecture and environment and unity. From the perspective of the development of architecture, its emergence is due to people's housing needs. After a long period of practice and development, the functions of architecture have gradually shown diversified characteristics.

(2) Transformation of aesthetic posture

Architectural aesthetics, as an important aspect of aesthetic experience, is characterized mainly by its historical and dynamic nature. In the past time people usually analyze architectural aesthetics from the perspective of aesthetics as an entry point. Based on this, the aesthetic characteristics of architecture are single, and with the evolution of architectural development trends and changes in people's values this aesthetic attitude is obviously difficult to adapt to the development requirements of the times. Based on this, people's aesthetic experience also has obvious changes [10]. In this process, people's attention to the ecological study of architecture has also increased, giving a new infectious power to architecture, thus providing an important impetus for the further development of architecture, and to the maximum extent to ensure that the effect of landscape architectural form can meet the expected requirements.

(3) Transformation of functional themes

From the perspective of the function of cultural architecture, mainly lies in providing people with places related to cultural life, with the continuous progress and development of society, the function of cultural architecture also has obvious adjustment and transformation. In this space, there is an all-round display of history and culture, and the nature of current cultural activities has also changed significantly in the process. The broadening of content and expression has had a strong impact on traditional behavior and has also provided an important impetus to the design of cultural architecture forms.

Although the communication between the viewer and the exhibits is objectively non-existent, when through this deep communication can fully stimulate the vitality of the internal space of the museum [11]. Based on this, we can accurately realize that the internal activities of museum buildings have also received the attention of architects, and the status of exhibits and viewers has fundamentally changed, with the viewer occupying the main position in the entire internal space of the building, and the viewing behavior having a direct impact on the determination of the location of exhibits in the interior, and the subjective experience of the viewer being emphasized in the design process. The viewers are no longer satisfied with the previous window exhibition form, and the display form of exhibits gradually shows diversified characteristics, which makes the viewing experience of the viewers greatly enhanced in this process.

**2.3 Geographic information system**

Geographic Information System (GIS) is a data management system with a spatially specialized form of information system, and he has the functions of centralizing, storing, manipulating, and displaying geo-referenced information [12]. He is mainly composed of hardware system, geographic data, and software system, whose main facilities of hardware system are intake equipment, storage equipment, and output equipment; software system mainly contains computer system software, GIS software, and application analysis programs.

Traditional GIS technology mainly relies on centralized information processing [13], and its data query, data storage, data analysis and processing, and application technology management are all dependent on the computer host. Through analysis, it is found that the requirements of this GIS processing method for computer hosts are not particularly high, and ordinary small and medium-sized processing stations can serve as processing. We can divide the technology into two parts, one is done by the host of GIS application, and the other part is done by the user's software program. In this way it is possible to obtain geographic information of different areas on the network through GIS technology in a situation where there is no limit of geography, no limit of time and no limit of environment, as long as the user of the operation of GIS technology [1].

With the emergence of nanoelectronics technology, its production of electronic components can make the production of computer components into miniaturization and intelligence, it is a good solution to the early limitations of computer integration and processing speed, resulting in computer technology continues to break through its own metatransformation speed to achieve a more intelligent and efficient processing degree and speed.

The continuous improvement of processing speed also leads to computer technology can break the limitations and can process more geographic information data at the same time, and in the collected large amount of data can carry out the simultaneous analysis of many contents, which greatly improves the satisfaction of the user's experience of using this data, and also reduces the time of data analysis using GIS technology, providing users with more efficient and high-quality data information [2,4 ]

(1) Applications in agriculture. In the application of the agricultural field, GIS GIS technology is mainly used in various research applications such as land resource information management, agricultural resource information management, and regional agricultural planning. In practice, GPS and GIS are combined to analyze the information of agricultural plots in an integrated manner. The use of this technology in the field of agriculture has been richly rewarded [3].

(2) Application in the field of forestry. The data and information on the use status, vegetation distribution and material of forestry areas in each region are organized for the reference of decision makers to carry out their decisions.

(3) Application in the field of land resources. By collecting, investigating and storing data, the information of land data of land parcels is organized to carry out the work of land resource evaluation, state-owned land resource planning and land use.

(4) Application in the field of environment. GIS technology is used to integrate and analyze natural resources environmental conditions, dynamic changes, and soil data information, and make full use of them in all aspects of environmental resource management, such as regulation, evaluation, governance, and tracking.

(5) Application in disaster occurrence. Through the collection of natural disaster information, according to the changes of GIS data, we can predict and evaluate the possible natural disasters or simulate the possible hazards when the natural disasters occur, and share the relevant data and information in time, so as to help decision makers provide decision basis and decision suggestions when natural disasters occur.

(6) the application of the oil industry, GIS technology is widely used in the oil industry, its use involves the exploration and development of oil to the collection of land, pipeline transportation, to the final sales process GIS technology is used throughout the process. Its main applications include: oil exploration, GIS technology can integrate existing oilfield resources and geographic information around, combined with analysis to assess the potential oil reserves in what spatial location and the characteristics of its existence. The various situations and data analyzed can be used to develop areas with potential oil fields, thereby reducing the time and difficulty of exploration and development. At the same time, we can use GIS technology electronic maps to carry out more reasonable pipeline planning and maintenance of pipeline transportation. Finally, in the marketing process, GIS technology can provide the sales company with oil market conditions, population data and traffic information, and analyze whether there is a demand for oil in the area or whether it has reached sales saturation.

GIS technology is used in various fields to analyze data, which sometimes involves the analysis of a large amount of data, if the storage space is small, it is not conducive to the storage of data, which leads to data analysis errors when analyzing data. This problem is solved by computer technology, which provides a large data storage space for GIS in the network cloud. At the same time, GIS technology has the function of storing data, so it can replace the old way of storing data in paper files, so that data from various places can be aggregated together. This reduces labor costs and saves time in data analysis. Paper data storage method, need a good storage place and proper storage, if lost or damaged can only be re-collected, the impact on the work. GIS technology is a good solution to this problem. GIS technology uses a calculator to transfer data to the cloud, and a large amount of data is aggregated and shared, making it easier and faster for people to use the data to extract the information they need, while also reducing the risk of data loss and improving the efficiency and accuracy of data analysis.

## 3 ROUTE OPTIMIZATION OF COLD LANDSCAPE BASED ON GEOGRAPHIC INFORMATION SYSTEM

### 3.1 GIS basic model establishment

Digital elevation model (DEM) is a combination of distribution of terrain attributes and spatial location of ground units. It is based on terrain data at a specific geographic range, which is mathematically transformed. The features

of this range can represent a three-dimensional space in two dimensions and are made up of discrete distributions of points to simulate three-dimensional terrain.

In this paper, we use satellite images and refer to the scenic tour guide map for terrain class identification. The so-called land class identification is to understand the basic use of the land in the scenic spot of Qianshan through the analysis and observation of the satellite map, and to grasp the land use situation. Through satellite images we can get the following information: ① Settlement situation: with the help of high-definition satellite images, we can see the basic conditions of the land surface in the study area. ②Road situation: We can get specific information such as the number, grade and direction of current roads and can understand the traffic condition around. ③Current waters: Based on the high-definition satellite images, we can clearly identify the river distribution and river width information in the planning area.

The geographic DEM data of the destination block downloaded and imported into ArcGIS10.5, as Google Maps has road information and and is also a vector map with digital elevation information. Since the elevation data is too large in scope, it is necessary to extract the required

Therefore, the satellite map was superimposed on the scenic guide map, and the mask extraction method was used to determine the boundaries of the scenic area. The elevation model of the scenic area is obtained by double overlaying the satellite map with the scenic area guide map and using the mask extraction method to determine the boundaries of the scenic area, as shown below.
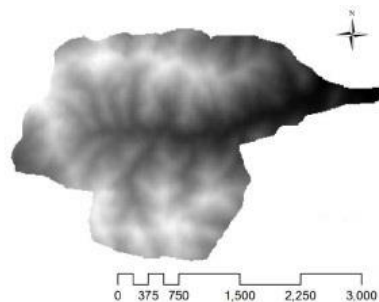


**Figure 4** Elevation DEM map of Scenic Spot

GPS can assist the research process, GPS mainly includes GPS measuring instruments and cell phone GPS positioning system, and this study uses cell phone GPS positioning system. The mobile phone GPS positioning system can easily and accurately record the elevation, latitude and longitude data of the key areas, and the actual measurement on site also needs to be adjusted and changed according to the site conditions, and the key areas are focused on measurement.
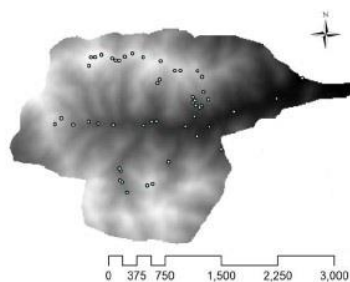


**Figure 5** Attractions in Scenic Spot

### 3.2 System Impact Factor Weight Design

In the process of selecting the route of the trail, in the application of hierarchical analysis, this study divides the influence factors into two levels to study: the first level is the relative importance of the four influence factors; the second level is the map of the four influence factors. The first level is the relative importance of the four influencing factors; the second level is the factor map of the four influencing factors The first level is the relative importance of the four factors; the second level is the weight of the four factors to describe the relative importance

of the factors. Firstly, according to the method of hierarchical analysis, the influence factors are compared with each other using the values of 1.3.5.7.9. values to compare two by two the influence factors to establish the importance judgment weight array. The specific analysis steps are as follows.

(1) Establish a comparison matrix, and use the literature analysis method and expert scoring method to compare the impact factors two-by-two with the specific ratio matrix, as shown in the following table.

**Table 1** Line selection impact factor ratio matrix

|  | Height | Slope | Land type | Visual Sensitivity |
|---|---|---|---|---|
| Height | 1 | 1 | 4 | 3 |
| Slope | 1 | 1 | 3 | 2 |
| Land type | 1/4 | 1/3 | 1 | 1/2 |
| Visual Sensitivity | 1/3 | 1/2 | 2 | 1 |

(2) Calculate the weights, following the method of the summation method of hierarchical analysis, which contains the following three steps.

1. Each column is summed up to find the sum.

2. Divide all the numbers in each table by the sum calculated in the previous step to obtain the standard scale matrix.

3. Sum each row and divide the sum by the number of evaluation criteria, which is divided by 4 in this paper, to obtain the factor weights, as shown in the following table.

**Table 2** Line selection impact factor weight calculation table

|  | Height | Slope | Land type | Visual Sensitivity | Total | Weighting |
|---|---|---|---|---|---|---|
| Height | 0.39 | 0.35 | 0.14 | 0.46 | 1.60 | 0.40 |
| Slope | 0.39 | 0.35 | 0.30 | 0.31 | 1.35 | 0.34 |
| Land type | 0.10 | 0.12 | 0.10 | 0.08 | 0.39 | 0.10 |
| Visual Sensitivity | 0.13 | 0.18 | 0.20 | 0.15 | 0.66 | 0.16 |

(3) Consistency test

The consistency test can also be divided into the following steps.

1. Multiply each column in the scale matrix with its corresponding weight and calculate the weighted sum of relative importance.

2. Sum up each row and divide this sum by the respective weight to obtain the consistency vector

3. Calculate the consistency C.I.

4. Calculate the consistency ratio C.R

**Table 3** Experimentmaterials

| Matrix Order | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| R.I. | 0 | 0 | 0.52 | 0.89 | 1.12 | 1.26 | 1.36 | 1.41 |
| Matrix Order | 9 | 10 | 11 | 12 | 13 | 14 | 14 | 14 |
| R.I. | 1.46 | 0.49 | 1.52 | 1.54 | 1.56 | 1.58 | 1.58 | 1.58 |

In summary, the impact factor weights calculated by the hierarchical analysis method are shown in the following table.

**Table 4** Route selection impact factor weight score

|  | Height | Slope | Land type | Visual Sensitivity |
|---|---|---|---|---|
| Weighting | 0.40 | 0.34 | 0.10 | 0.16 |

**4 Optimal Design and Realization of Scenic Routes in Cold Regions**

The purpose of organizing travel routes in cold landscapes is to allow visitors to learn more about the tour within the limited tour time and to choose a route that suits them can spend their tour time happily and leave a good impression of the scenic area.

**4.1 Data compilation of scenic tourist routes in cold regions**

A good tour route should not only enable tourists to have impressive points during sightseeing tours, the scenic area can produce good memories, but also should be combined with the interests of tourists to arrange the tour route. Tourists are willing to stop within the sights during the tour, the main reasons are: (1) the beautiful scenery attracted tourists addicted to it, quietly enjoy, do not want to leave; (2) to reach the rest area, tourists need a short break dining, need to rest to replenish energy; (3) tourist areas have tables and chairs and other leisure facilities can be short stay; (4) the rich content of scenic spots, tourists visit overwhelmed, must stop to view; (5) mountain peaks when the summit, refreshing, stop to see from afar; (6) religious attractions such as religious worship, where tourists have a purpose to stop. The above reasons and the observations of the sites from the field research can be used to derive the length of stay for each site, as shown in the table below.

**Table 5** Part attractions stay statistics table

| Site Number | Name of the site | Dwell time (min) |
|---|---|---|
| 1 | Five Buddha Dome | 10 |
| 2 | Heaven above the sky | 6 |
| 3 | Heaven Beyond Heaven | 6 |
| 4 | Zuetsuji Temple | 4 |
| … | … | … |
| 41 | Wang Erlie's Study | 2 |

In the scenic spots, the mode of transportation for sightseeing depends on the topography of the area and the physical ability and time allocation of visitors. The main roads can be used for sightseeing buses, which help visitors to reach the destination spots easily and quickly; hiking is mostly suitable for climbing or hiking activities; cable cars are suitable for helping visitors who are physically difficult to climb. From the existing transportation methods in the scenic area, combined with the activities of tourists To summarize the transportation in the scenic spot: sightseeing bus as a tool for car travel, hiking and sightseeing ropeway.

The distance between attractions is not a straight line between two points, but is influenced by the terrain and the The distance between points of interest is not a straight line between two points, but is influenced by the terrain and is a curved segment that undulates with the terrain. Since the distances between attractions obtained by using the measurement tools in GIS are projected distances, not actual distances, and the distances between attractions are not the actual distances. The elevation DEM data of each site can be extracted to the point element, so the actual distance has to be measured before adding the site distance. The actual distance is measured before adding the distance to the site, using the Pythagorean theorem.

Actual distance2 = horizontal distance2 + height difference2

The distance between attractions is now quantified and converted into a time factor. We know that the general walking speed of human is 5km/h [8], but for mountain recreation, the walking speed is 2km/h at slow speed and 3.3km/h at medium speed [9], combined with the actual research and the difficulty of climbing in Qianshan Mountain, the speed of mountain climbing road is set as 2km/h, i.e. 33m/min. The speed of the main road and the route of the Big Buddha is set as 3.5km/h, i.e. 58m/min. The speed of the sightseeing bus that tourists take in the scenic spot is set at 3.5km/h, i.e. 58m/min. The national regulations stipulate that the speed of the sightseeing bus cannot be greater than 20km/h. Therefore, this paper set the speed of the car to 20km/h, that is, 333m/min. as shown in the table, the ropeway time is 15min.

**Table 6** Part attractions distance time

| Visitor Road Code | Name of two attractions | Transportation mode | Speed | Two points straight line distance | Elevation 1 | Elevation 2 | Elevation difference between two points | Actual distance between two points | Arrival time |
|---|---|---|---|---|---|---|---|---|---|
| 1 | Thousand Hills Main Gate - Rainy Pear Garden | Hike 2 | 58 | 484 | 138 | 148 | 10 | 484.1 | 8.3 |
| … | … | … | … | … | … | … | … | … | … |
| 13 | Yuxia Pass- Buddha's Hand Peak | Hike 3 | 33 | 153 | 490 | 496 | 6 | 153.1 | 4.6 |

**4.2 The design of the scenic tour route in the cold region**

When each section of the route has been quantified in terms of time, the travel time of the tourists on the tour can be calculated, and the tour time plus the time spent at the attractions is the total tour time. Combining the results of the visitor questionnaire and the above-mentioned table of time spent at attractions and time quantification, the seven tour routes with four different functions are organized from the perspective of visitor demand and based on the mountain features such as topography and landscape analyzed by GIS technology in the previous section. The points in the routes are core attractions or road intersections, and the tour route schematic also contains suggested tour directions and suggested transportation modes. The specific tour routes are as follows.

(1) mountaineering cold scenery route optimization

Route attractions: the main gate of Thousand Mountains - Immeasurable View Plaza - Immeasurable View - Heavenly Sky - Heavenly Beyond - Five Buddha Top - Pu'an View - Five Buddha Top Plaza - Immeasurable View Plaza.

The whole journey takes 4 hours.

Suitable for tourists: (1) first time visiting this place, expecting to reach most of the core climbing spots; (2) prefer climbing sports; (3) family trip for young middle-aged friends.
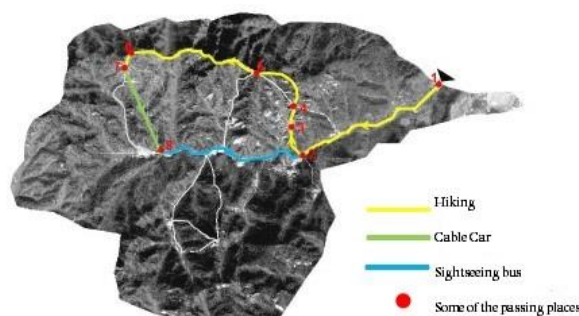


**Figure 6** Mountain climbing cold landscape route

In this survey, the proportion of people climbing and viewing the scenery on non-holidays is 46%, and 58% on holidays, and climbing is the main way to visit Thousand Hills. This route is based on climbing tour route, this tour route needs to consume a lot of physical energy, climbing tour time is also very long. It is suitable for young and middle-aged tourists who love mountain climbing, love natural scenery, and have strong adaptability and good physical ability. This tour route has winding paths and reasonable distance arrangement along the attractions, along with beautiful natural scenery, you can climb to the highest point of the top of the five Buddhas. It is also highly recommended for visitors to this area because it passes through most of the core hiking sites. Table 5.3 shows the statistical time for Route 1, including the climbing time and the time spent at the sites, and the total time for this route is approximately 230 minutes.

(2) Fitness cold scenery route optimization

Route Attractions: Thousand Hills Main Gate - Immeasurable View Plaza - Five Buddha Top Peach Blossom Valley Ride Drop Station - Pu'an View - New Attractions 1 - New Attractions 2 - New Attractions 3 - New Attractions 4 - Five Buddha Top Peach Blossom Valley Ride Drop Station This route.

Duration is about 2-3 hours.

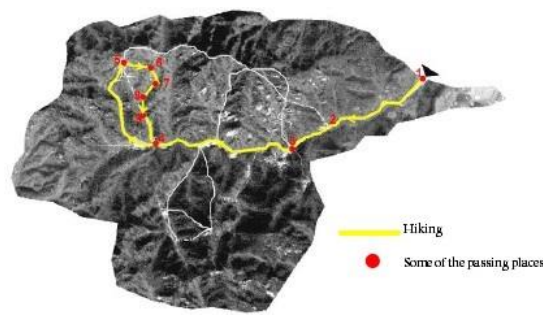Suitable for tourists: tourists who aim at hiking and resting



**Figure 7** Fitness Cold Land Scenic Route

This route is a combination of fitness, health and recreation. According to the research statistics, the proportion of visitors who come here for the purpose of hiking accounts for 16% on non-holidays and 6% on holidays, while the demand of visitors for new hiking routes has also become a key consideration in this study. The route is designed to provide a relatively gentle, walking fitness path for visitors who come to this scenic area frequently and for the purpose of hiking and resting, avoiding crowded crowds, with a total tour time of about 120 minutes.

  (3) Optimization of the pilgrimage route to the cold landscapes

Route Attractions: Main Gate of Chisan Mountain - Cave of Heaven - Big Buddha Temple - Tiancheng Maitreya Dojo - Maitreya Treasure Hall - Chisan Maitreya Buddha - Yuantongguan - Fuchuan.

The whole journey takes about 3 hours.

Suitable for tourists: (1) tourists who visit for the purpose of pilgrimage; (2) tourists who wish to participate in climbing activities and experience Buddhist culture at the same time.
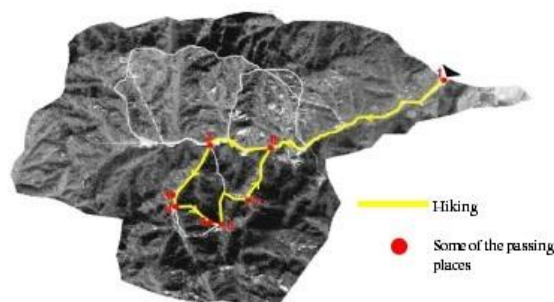


**Figure 8** Pilgrimage route to cold landscapes

This tour route is mainly applicable to religious pilgrimage tourists, to stay in the temple activities, approaching the humanities this route is mainly for the purpose of pilgrimage tourists to provide reference, feel the Buddhist culture, but also the part of climbing. This route tour with a combination of movement and static, both jumping off the mountain climbing process, but also quiet humanistic care, and climbing slope appropriate, moderate intensity, adjust the mental state of tourists, relieve fatigue, relaxation.

## 5 Conclusion

Traditional methods of organizing scenic tourism in cold scenery analyzes scenic spots subjectively and qualitatively from the behavioral and aesthetic angles. Relationships between scenic spots, however, different tourists have different tourism contents, activities and travel time, which is usually ignored by the designers. However, the content, activity and duration of other visitors are usually ignored by the designers. In this paper, the structure of footpath system based on GIS technology is calculated and optimized, so as to organize the route of scenic spots, avoid the subjective factors, and combine scenic spots by using quantitative time factors.

This research combines a theoretical perspective with a practical perspective, and explores the GIS technology from two aspects. The application of geographic information system technology can effectively improve and upgrade the complexity of cold landscape route planning from a technical level, so as to achieve a better application effect. The cost connectivity analysis of GIS can be used to improve and enhance the technical aspects of GIS-based routes for cold landscapes, based on a new trail system that quantifies the distance to the site in terms of time and the same type of routes based on current needs. Although the cost connection method of GIS can show as many things as possible to tourists in the shortest and best way, the selection of control points on the route and the location of new scenic spots will be further studied and discussed.

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