Research on the Construction of Tourism Route Guide Platform based on 3D Visualization

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Abstract

Vigorously developing the modern service industry with mountain tourism as the focus is to promote the supply side reform of Guizhou provincial Party committee and provincial government, a major decision to build a world-famous mountain tourism destination. Guizhou is rich in tourism resources, with distinctive karst landforms. It mainly integrates mountains, karst caves, waterfalls, hot springs, humanities, leisure and entertainment. However, due to the complex terrain, the crisscross traffic paths between scenic spots, the inaccurate guidance, the incomplete tour and the neglect of scenic spots caused by the conventional scenic spot map often bring many regrets to tourists. In this paper, by using the UAV Oblique-photograph 3D models, based on the SuperMap geographic information platform for secondary development, the MySQL database is established, combined with HTML, JavaScript and other technologies, so as to build a tourism route guidance platform, realize three-dimensional visual tourism route guidance, display the real and intuitive landscape features of scenic spots for tourists, stimulate the interest of tourists, and guide them According to their own preferences and the characteristics of the scenic spot, visitors can plan and guide the route.

Keywords

Oblique-photograph 3D models, Secondary development of GIS, Tourist route planning, Navigation platform architecture.

1. INTRODUCTION

In recent years, tourism has rapidly developed into one of the most dynamic industries in the country and even in the world. Tourism has become an indispensable leisure demand of people. With the advent of the Internet plus and the era of big data, various tourism platform systems are flocking out, most of which are regional tourism route planning and scenic area recommendation, which provide some information and resources for tourism to some extent, but these system platforms are for the route planning between scenic spots and scenic spots, and are based on two-dimensional map for planning display. Lack of route planning and 3D display of single scenic spot. Human beings are visual animals. The main way for human beings to perceive the physical world is through vision. It is a very meaningful attempt to realize the scenic spot display and route planning based on 3D visualization. In this study, a platform based on 3D visualization for internal route planning of scenic spots is established to provide tourists with visual perception of external space in the system interface, which is believed to effectively improve the experience and convenience of tourists.

2. PLATFORM DESIGN

2.1. Platform Design Principles

Each system platform should have a corresponding design principle. In this principle, development and design should be carried out. One design principle of this platform mainly includes the following points:

(1) Principle of true reliability. There are many factors affecting the operation of the system platform, such as the performance of the software, network environment, server, etc. to ensure the smooth operation of the platform, and to ensure that the three-dimensional model of the scenic spot displayed by the platform is consistent with the real scene as far as possible, to achieve scientific and reliable, and to enhance the trust of tourists.

(2) Principle of practicality. The design of the platform does not need to be too complicated. The function of the platform should meet the tourists' preference for scenic spots, facilities, services and sense needs, and be able to solve the practical problems for tourists, so as to win the praise of tourists.

(3) Principle of operability. No matter the function or interface design of the system should be easy to understand and operate, because the operator is not a professional, so the platform must be simple and easy to operate, and can quickly query and display information.

2.2. Platform Frame Design

When designing the whole platform, we must first complete the collection of three-dimensional model of tilt photography and the processing of interior business model. The database uses MySQL database to integrate three-dimensional model data, geographic information data and other related structured data, and then uses HTML, JavaScript and other technologies to carry out the secondary development based on the SuperMap platform to establish a practical three-dimensional visual tourism route guide Viewing platform.

The platform is to give full play to the advantages of Internet technology, and finally achieve the application effect of the navigation platform, and realize its application value. The system architecture is as follows:

(1) User interface layer

This layer provides users with interface to interact with the system. These interfaces include the acquisition of Oblique-photograph 3D models data, scenic spot evaluation data, etc. users can interact with the system through these interface, and can use the data visualization technology provided by the system to visually view the acquired data.

(2) Model layer

This layer is the core layer of the system. Data processing, statistical analysis, the implementation of various structural algorithms and the construction of functional implementation process will all take place at this level. Data cleaning can be carried out by standardizing data format, deleting wrong data as required and processing some data fields that do not meet the requirements, so as to get the accurate data we need. The analytic hierarchy process and Bayesian network are used to build the evaluation function of scenic spots, and the evaluation and analysis of scenic spots are carried out.

(3) Data access layer

This layer realizes the unification of the interface calling format, and completes the basic data operation functions such as adding, deleting, modifying and querying the required data.
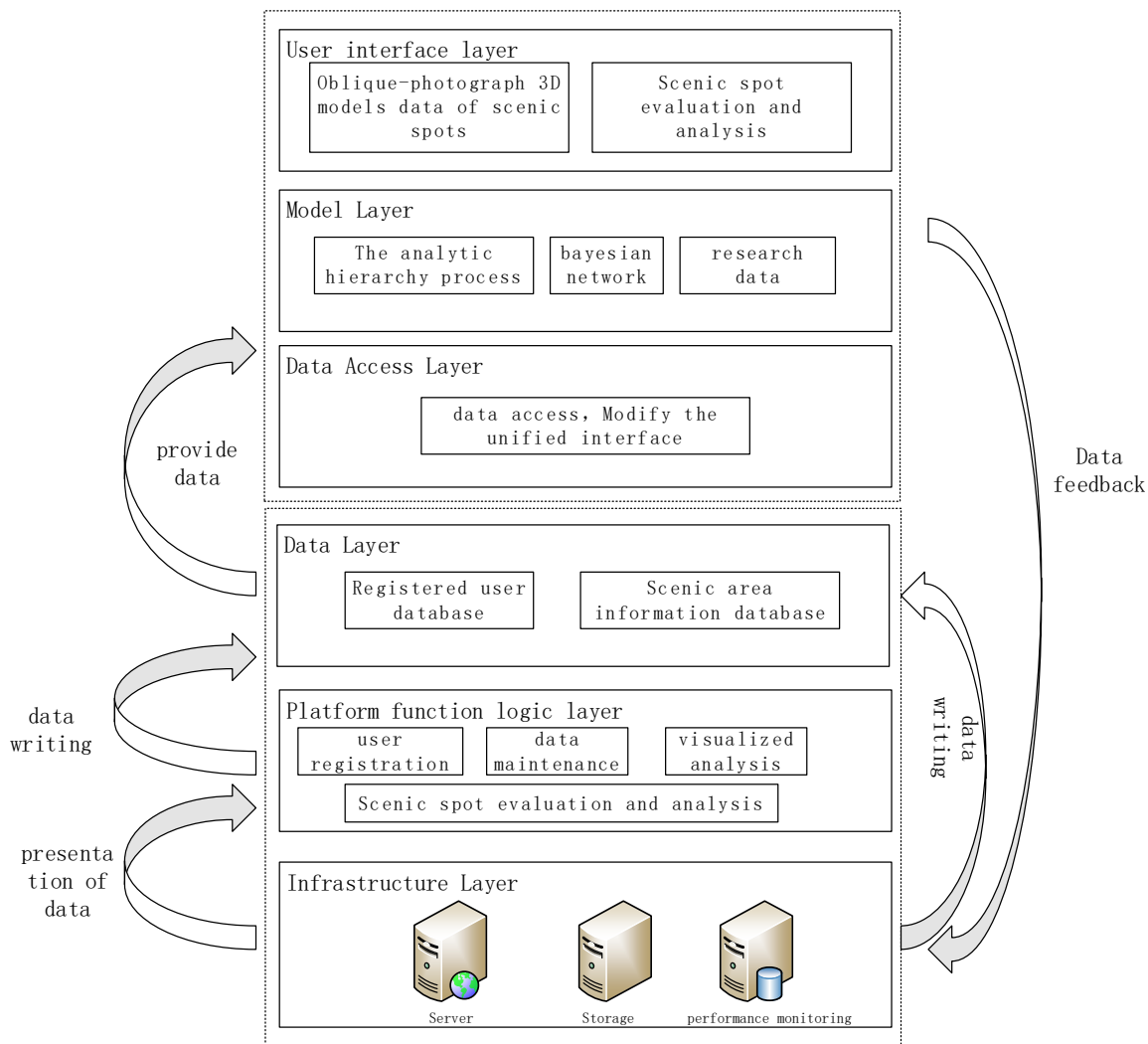
Figure 1. System platform frame diagram

(4) Data layer

This layer is mainly used to store the information input of registrants and scenic spots, form a specific database, and set the data access rights.

(5) Platform function logic layer

This layer is the function realization of the whole system platform, which mainly includes the analysis of scenic spot evaluation, data maintenance, visual analysis and other functions.

(6) Infrastructure layer

This layer is to store the data information of the whole platform and monitor the performance of the platform. Each layer is closely connected to realize the efficient operation of the whole platform.

2.3. Platform Function Design

The function of the three-dimensional visual tour route guide platform is to plan the tour route of the scenic spot and make the suitable tour route for the tourists. All data in the platform needs to be placed on the server. Through "login", visitors can query "scenic spot information", perform "map browsing", "real-time positioning", "GIS spatial analysis" and other functions. In addition, tourists can also query the results of scenic spot evaluation, obtain the scenic spot evaluation information they want to visit, and plan an viewing road through the platform Line,

and three-dimensional display on the platform, can also be through the platform system platform through machine calculation and analysis to plan the scenic spot tourism route plan for tourists to choose. Thus, the tourists' sense of experience will be greatly improved, more comfortable and thoughtful services will be provided for them, and the revisit rate of the scenic spot will be improved.

3. PLATFORM IMPLEMENTATION

Under the operating system of Windows 7 or windows 10, based on the three-dimensional tilt model and three-dimensional geographic information platform, MySQL is used as the service database to provide APIs for multiple programming languages, provide multiple database connection ways, provide management tools for management, inspection and optimization of database operation, etc., JavaScript is used as the programming language, and MyEclipse is used as the development ring Finally, the spatial data is released in the super map iserver of hypergraph to realize the development and design of the system platform.

4. CONCLUSION

Through the establishment of the internal route planning platform based on 3D visualization, the tourists can enjoy the best and most scenic spots in a shorter period of time, which can effectively improve the convenience and experience of tourists, provide comfortable services for tourists, so as to improve the revisit rate of scenic spots, promote the economic development of scenic spots, and promote the vigorous development of China's tourism industry.

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