Application Research on Computer Aided Simulation of Coastal Wetland Topography and Seawater Inundation Range

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Abstract. The computer-aided simulation of terrain optimization scheme can effectively solve the analysis problem of coastal wetland terrain and seawater inundation. The construction of three-dimensional model uses the traditional polygon-based method, which has great expression in terrain complexity and flexibility. The limitations of voxel-based terrain production methods have brought various innovative ways to improve the quality of the 3D world scene while saving costs. A large part of the success of simulation technology now comes from the highly realistic 3D virtual world, which makes people immersed. And the application based on computer modeling can well meet the requirements of high-quality scenes. With the development and maturity of computer modeling technology, we are left with both opportunities and challenges. This article analyzes them.

Keywords: Computer-aided Technology, Terrain, Research

1. Introduction

Topographic surveying and mapping refers to the study of the topography within a certain range, so as to know the surface conditions and draw the results on the map. As the speed of China’s economic development has increased, the current society’s emphasis on topographic surveying and mapping technology has gradually increased. Therefore, improving the effectiveness of map surveying and mapping technology is one of the most important tasks today.

2. Computer terrain assist technology

2.1. Inadequacies of surveying and mapping projects for different situations
Surveying and mapping projects are currently widely used and the problems encountered are also different. In the overall surveying and mapping project, the most inadequate technical aspects are the surveying and mapping work carried out under special terrain and special environment[1]. For example: how to maximize the use of land and how to progress the land survey work in remote mountainous areas. China's cities are widely distributed, regardless of the natural environment between cities, or the overall land form changes are more variable and complex. This kind of complex terrain is extremely common in the plateau region of China. Taking the Loess Plateau as an example, the soil is soft and sparse. The structure of the terrain is also uneven due to the particularity of the area. During the surveying and mapping project, there is a problem that the location of the railway cannot be determined. If there is a large natural disaster or heavy rain in the local area, it will cause damage to the railway equipment. In view of different urban environments and natural factors, there are still many problems in surveying and mapping engineering that cannot be effectively solved at present and professionals need to constantly improve and explore the road of surveying and mapping.

2.2. Some limitations of current surveying and mapping technology

For the current surveying and mapping projects, the most used are total station digital mapping technology and GPS-RTK digital mapping technology. With the continuous promotion of technology, people have gradually discovered some limitations and shortcomings in the application process. However, the application scope of this technology has certain requirements on the measurement area and only some areas with relatively wide terrain and wide field of vision can be selected. Therefore, only the traditional surveying technology and modern surveying technology are fused and the two can complement each other to maximize the improvement[2]. Work efficiency to achieve the ultimate surveying and mapping purposes.

3. The importance of the analysis of coastal wetland terrain and seawater submergence

3.1. Rich landscape space level

Terrain is the most basic skeleton of the garden landscape, which can effectively enrich the landscape hierarchy and divide the landscape space, so that people can get more perception and emotional resonance from the landscape. On the one hand, the micro-topography design is more conducive to the growth of plants, whether it is a city park or the space covered with soil on the roof of the garage in the residential area. At the same time, the combination of micro-topography for plant landscaping can form a good skyline and increase plant levels. To make each plant growth space of Qiao shrub grass complement each other; on the other hand, the micro-topography design is conducive to creating an overall space pattern of orderly advancement and retreat, which allows more design methods such as scenery, borrowing and obstacles to be easily realized. This in turn enriches the overall space. The hierarchical distribution is shown in the figure 1.
3.2. Improve the ecological environment

The current level of urbanization in China is already relatively high. In the process of rapid urbanization, various urban constructions are in full swing. In order to improve the ecological environment, many urban green spaces are planned and retained and the requirements for the landscape of the residential area are becoming higher and higher. In the new or rebuilt landscape projects, the content of micro-topography design is involved. The micro-topography design can improve the ecological environment from two aspects[3]. First, it provides abundant plant growth conditions by simulating natural topography, such as sunny slopes, shady slopes, wetlands, etc. and increases the stability of the community through rich plant diversity; It is from the perspective of human behavior psychology. Due to the large-scale construction of the city, the stiff reinforced concrete forest makes people have a stronger psychological return to nature. Through the creation of micro-topography and green spaces, a green ecological and vibrant environment is built. The earth meets people's psychological needs.

3.3. Water storage and drainage function

In the natural world, terrain is the product of thousands of years of formation and a dynamic process of change and the river system has a long-term impact on natural landforms. Micro-topography design plays an important role in water storage and drainage in garden landscape[4]. Good topography design can form a natural drainage system and provide the most basic guarantee for plant growth. The sponge city that is now being vigorously developed mainly collects and utilizes rainwater by means of sunken greening and other methods. The main planning and design concepts are "slow discharge and slow release" and "source dispersion" control, which avoids floods and floods. Rainwater was collected effectively.

4. Terrain analysis based on computer-aided simulation technology

4.1. Guarantee the application cost of automatic topographic surveying and mapping technology

In the use of automated topographic surveying and mapping technology, the cost problem is an important factor that causes the current promotion work to fall into obstacles. Therefore, how to
reduce the application cost of automatic topographic surveying and mapping technology is one of the important problems that should be solved at present. Although government departments provide certain financial support for the technical application of many surveying and mapping units, the surveying and mapping units themselves should also seek ways to solve the cost problem. In the specific cost resolution work, the surveying and mapping unit can sign commercial contracts with some social engineering enterprises and seek financial support from social enterprises through mutual cooperation. This type of cooperation is a win-win strategy[5]. Social enterprises can obtain technical resources from surveying and mapping units and surveying and mapping units can obtain financial support from social enterprises, which greatly guarantees the application cost of automated topographic surveying and mapping technology. In addition, the surveying and mapping unit itself should also implement the research and development of automated topographic surveying and mapping technology and let the technological innovation through the research and development work, so as to reduce the cost. The mapping fitting mode is shown as figure 2.

![Figure 2. Mapping fitting mode](image)

4.2. Pay attention to the on-site use of automated measurement and mapping technology

In order to make the role of automated surveying and mapping technology fully manifest, the social surveying and mapping technology unit in today's society should fully recognize the on-site use of surveying and mapping technology. In the specific application process, we often encounter various complex terrains and various unpredictable situations, which have a profound impact on the application of modern automated surveying and mapping technology. Before using, technicians should implement and improve the field inspection work. Through the field inspection, they should know and analyze the many problems that will be encountered during the use process, so as to improve the effectiveness of the technology at the time of implementation[6].

5. Conclusion

The development of modern science and technology provides technical support for the current topographic surveying and mapping technology. The relevant departments should have the consciousness of introducing modern science and technology into modern automated topographic surveying and mapping technology, so that the topographic surveying and mapping technology can be fully upgraded. In the process of technology implementation, technicians should follow the steps to use automated surveying and mapping technology to ensure the quality of technology application. At
the end of use, the technical staff should do a good job of summarizing work to provide guarantee for the next application of automated surveying and mapping technology.

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