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Analysis of Constructing 3-Dimensional Virtual Scene Technique Based on DEM	
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Keywords	DEM, GeoVRML, GIS Server, Terrain Analysis, Virtual Reality Geographical Information System
Abstract	High resolution DEM(Digital Elevation Model, DEM) is created based on original CAD terrain map (one reservoir as example). Then the article offers precision analysis、topographic factors analysis、visibility analysis、reservoir volume and submerging acreage computing. Then adopting GeoVRML technique is to implement the functions of WebGIS 、visualization and query of computing result、graph data visualization and reservoir region virtual scene roaming etc. The system implements deep administrative levels information diged and long-distance visualization expression. The result shows on the basic high resolution DEM to realize 3-Dimensional Visualization Analyse and calculation functions and compress the spatial data to release these data in the WebGIS(Web Geographical Information System, WebGIS) as well as.
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Analysis of Constructing 3-Dimensional Virtual Scene Technique Based on DEM

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Introduction

Digital Earth is put forward by the U.S. Vice President Al Gore in January 1998 at the California Science Center at the opening ceremony titled "The Digital Earth: Understanding our planet in the 21st Century". The speech is constituted by a GIS, network, virtual reality and other high-tech concepts closely related[1], following the speech the digitalization project started around the world to mushroom like bamboo shoots after a spring rain. Applying the DEM to make the actual terrain(the real world) digital, that is to say, making the real word virtualization, to reproduce, or preview the real world, the real situation, to provide people with an intuitive visual effects and scientific basis for policy decision[2]. At the same time, network-based virtual reality technology in the interactive query, real-time roaming, three-dimensional model constructing, mass three-dimensional data display and compression research has also made great progress, effectively promoted the sharing of information resources and remote visualization of information inquiries.

Construction of DEM

DEM and Their Functions. DEM is the use of an arbitrary coordinate field in which known coordinates (X, Y, Z) are selected largely to express a continuous surface statistically. It is to say that the DEM is the simple figures expression of a terrain surface which describes the Earth's surface shape and the spatial distribution of a variety of information on the orderly array of values[3]. Always using TIN (Triangulated Irregular Network,TIN) is to approximate the terrain surface which is generated by many irregular distribution of data points which forms a continuous triangulated irregular surface[4].

DEM which has a high application value is the most important spatial information datum in geographic information systems field and the core data on which is to conduct the terrain analysis, but also the important basic data which is used to develop three-dimensional model and terrain analysis.