

The Visualization of Hydrological and Hydraulic Models Based on the Platform of Autodesk Civil 3D

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Abstract : Cities in China today is faced with an increasingly serious river ecological crisis accompanying with the development of urbanization: waterlogging on account of the fragmented urban natural hydrological system; the limited ecological function of the hydrological system caused by a destruction of water system and waterfront ecological environment. Additionally, the eco-hydrological processes of rivers are affected by various environmental factors, which are more complex in the context of urban environment. Therefore, efficient hydrological monitoring and analysis tools, accurate and visual hydrological and hydraulic models are becoming more important basis for decision-makers and an important way for landscape architects to solve urban hydrological problems, formulating sustainable and forward-looking schemes. The study mainly introduces the river and flood analysis model based on the platform of Autodesk Civil 3D. Taking the Luanhe River in Qian'an City of Hebei Province as an example, the 3D models of the landform, river, embankment, shoal, pond, underground stream and other land features were initially built, with which the water transfer simulation analysis, river floodplain analysis, and river ecology analysis were carried out, ultimately the real-time visualized simulation and analysis of rivers in various hypothetical scenarios were realized. Through the establishment of digital hydrological and hydraulic model, the hydraulic data can be accurately and intuitively simulated, which provides basis for rational water system and benign urban ecological system design. Though, the hydrological and hydraulic model based on Autodesk Civil3D own its boundedness: the interaction between the model and other data and software is unfavorable; the huge amount of 3D data and the lack of basic data restrict the accuracy and application range. The hydrological and hydraulic model based on Autodesk Civil3D platform provides more possibility to access convenient and intelligent tool for urban planning and monitoring, a solid basis for further urban research and design.

Keywords : visualization, hydrological and hydraulic model, Autodesk Civil 3D, urban river

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