AUTOMATIC RECONSTRUCTION OF 3D ENVIRONMENT USING REAL TERRAIN DATA AND SATELLITE IMAGES

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ABSTRACT—This paper presents a novel 3D reconstruction method for large-scale 3D environments. There are three core components of our work: dynamic terrain modelling, river and water region identification and modelling using an active contour model and primitive shape matching method. Real-time environment reconstruction is constructed using real measurement data of GIS, in terms of digital elevation data and satellite image data. A Nona Tree Space Partitions (NTSP) algorithm is proposed for dealing with very large data processing and visualisation. A new geometric active contours model is used to automatically segment interesting image areas such as water or flooded regions, forest region and residential region. A primitive shape matching method is proposed to detect the residential objects, such as buildings and houses. The experimental results demonstrate that our approach is a promising one, which is able to deal with large environment reconstruction effectively.