Construction Geometric Model and Topology for 3d Cadastre–case Study in Taizhou, Jiangsu

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SUMMARY

As the development of economy in China, the requirements of land resources growth rapidly. For this reason, the land development is extending to 3D space. To manage the 3D space of land use, 3D cadastral management is needed urgently in China. Modeling of the 3D cadastral object has always been the core in the research of 3D cadastre.

To take full consideration of the history of cadastral registration and make full use of current 2D cadastral data, constructing 3D cadastral data from 2D cadastral data is a widespread used solution for 3D cadastre. For most of the 3D cadastral object are regular, simple and practical approaches based on extrusion are widely used in 3D modeling. In this paper, we aim to propose a new modeling approach for the 3D cadastral object based on extrusion. Unlike extrusion of most approaches, our approach do not allow overlaps with between footprints. And a footprint can be used to construct one or more 3D objects. Based on this approach, we extract 2D topological features from 2D footprints. Then we use 2D topological features and height values to present 3D topological features.

By studying the 3D cadastral situation of Pozi street in Taizhou, we knew the requirements for 3D modeling. We applied our approach to model 3D property space in Pozi street. Then we constructed the 3D topology of these property spaces. This approach has no advantage in modeling complex 3D object.

However, it can construct more 3D objects than extrusion based approaches before. It provides an easy and practical solution for constructing 3D model and topology in 3D cadastre. Using the 2D feature to present the 3D feature can save storage space. Considering the current situation of cadastral management in China, it may provide a new idea for constructing 3D cadastral objects.

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