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Globe spatial four-tree subdivision grid system and spatial-temporal coding model for address

Wu Pengda, Li Chengming and **Yin Jie** Chinese Academy of Surveying and Mapping, China

As a "bridge" connecting the information of various fields, address has the characteristics of multi type, multi temporal and multi levels. However, the description of address data is not uniform, and it is difficult to establish the relation between the address and the regular grid data. So, we constructed a globe spatial four-tree subdivision grid system based on GeoSOT from Peking University, designed a multi-scale spatial-temporal coding model of address and build the mapping rules from the address's location to a set of grids. The globe spatial subdivision grid system is composed of 21 layers of grid, which can describe the earth surface information from global scale to 0.5m resolution. The address coding model is described by a one-dimensional and fixed-length array, which is coded with four quadrants and composed by the following five elements: the first one is CP, which is named as the Location Code; the second one is L, which is named as the Level Code; the third one is two span codes, which describes the spatial range of geographic entities; the fourth one is unique coding of geographic entities that contain multiple industries and the time code is the last elements. The actual data shows that the method is simple and practical, and it is easy to understand the spatial location, regional scope and spatial relationship of the address. The method proposed in this paper can effectively promote the comprehensive analysis and sharing of urban spatial information, and is suitable for the analysis and mining of spatial big data.

wupd@casm.ac.cn