Hierarchical Data Structures for Geographic Information

- Abstract -

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Project, geographic information system, graphic representation, data handling, linear quadtrees

The status of an ongoing research effort to develop a geographic information system based on a variant of linear quadtrees is described. This system uses quadtree encodings for storing area, point, and line features. Recent enhancements to the system are presented in greater detail. This includes a new hierarchical data structure for storing linear features that enables representing straight lines exactly as well as permitting updates to be performed in a consistent manner. The memory management system was modified to enable the representation of an image as large as 16,384 by 16,384 pixels. Improvements were also made to some basic area map algorithms which yield significant efficiency speedups by reducing node accesses. This includes windowing, set operations with unregistered images, a within function, and an optimal quadtree building algorithm which has an execution time that is proportional to the number of blocks in the image instead of the number of pixels.

[Hierarchische Datenstrukturen für Geographische Informationen]


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