Delimited Stroke Oriented Algorithm-Working Principle and Implementation for the Matching of Road Networks

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Abstract

With the increasing availability of diverse geospatial databases, data integration becomes an indispensable process to assure the quality and add values to each single data source as well as promote the interoperability among different data sources. The paper presents an operational automatic matching approach for road networks based on the *Delimited Stroke Oriented (DSO) algorithm*. It consists of four processes: (1) establishment of an index to record the relationship between conjoint objects; (2) construction of the *delimited strokes*; (3) matching between the corresponding *delimited strokes*; and (4) matching growing from seeds. With the help of index, the conjoint edges to a *delimited stroke* can be easily brought together. The corresponding network is then treated as an integral unit in the matching process. As compared with point- or line-based matching, such as *Buffer Growing (BG)* and *Iterative Closest Point (ICP)*, the network matching allows the consideration of more topological information in a larger context environment. Consequently, the *DSO algorithm* is able to yield a considerably improved matching performance in terms of computing speed, matching rate, matching certainty and robustness. The approach has been successfully tested on large road networks from a number of federal states in Germany.

Keywords

matching algorithm, data integration, delimited stroke, context information, road-network