A Deletion-Cost Based Fast Compression Algorithm for Linear Vector Data

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Abstract : As there are deficiencies of the classic Douglas-Peucker Algorithm (DPA), such as high risks of deleting key nodes by mistake, high complexity, time consumption and relatively slow execution speed, a new Deletion-Cost Based Compression Algorithm (DCA) for linear vector data was proposed. For each curve — the basic element of linear vector data, all the deletion costs of its middle nodes were calculated, and the minimum deletion cost was compared with the pre-defined threshold. If the former was greater than or equal to the latter, all remaining nodes were reserved and the curve's compression process was finished. Otherwise, the node with the minimal deletion cost was deleted, its two neighbors' deletion costs were updated, and the same loop on the compressed curve was repeated till the termination. By several comparative experiments using different types of linear vector data, the comparison between DPA and DCA was performed from the aspects of compression quality and computing efficiency. Experiment results showed that DCA outperformed DPA in compression accuracy and execution efficiency as well.

Keywords : Douglas-Peucker algorithm, linear vector data, compression, deletion cost

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