Reasoning of Topological Relations between Imprecise Regions

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Abstract

There are inevitably some errors or uncertainties in spatial data. Such kind of uncertainty will further influence the accuracy of topological relations, which are obtained by reasoning from observation data. In this paper, a determination approach based on relative possibility for topological relations under uncertainty is proposed. First, the effect of positional uncertainty on topological relations is investigated and, statistical modeling of spatial data uncertainty is provided. Then a set of uncertain topological relations for two imprecise regions were built upon a new formal model, proposed by Chen and Deng (2003). Further, some basic functions, which are used for a valid link from positional uncertainty propagating to relation uncertainty, are derived. Finally, a simple example is provided for the illustration of the approach presented in this paper.

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