

Consistency in Spatial Databases

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Abstract: *This paper delves into the consistency challenges associated with integrating multiple sets of spatial data in Geographic Information Systems (GISs). The data sets in question, which provide information about the same geographic features, often come from different sources and times, varying in reliability, accuracy, and scale. This leads to multiple spatial representations for these features. The proposed systematic approach begins with breaking down the consistency issue by identifying various consistency classes that can be checked independently. These classes represent a comprehensive set of properties and relationships necessary to fully identify geographic objects in the data sets. Different levels of consistency—total, partial, and conditional—are then proposed for each consistency class, allowing for the integration of data sets without requiring total consistency in every aspect. The second step involves explicitly representing these consistency classes and levels in the system. As an example, a simple structure storing adjacency relationships is given for representing topological consistency. The paper also suggests explicitly representing the consistent knowledge in the data sets (mainly qualitative) and accounting for the uncertainty or ambiguity inherent in the knowledge.*

Keywords: Geographic Information Systems