

New 3D data type and topological operations for Geo-DBMS

Abstract

DBMS becomes very important for GIS as it used to handle large volume of spatial data and could ensure the stability of dataset handling. Next generation of GIS software would highly depend on DBMS in both geometrical modeling and analysis. One of the desired components in such future software or system is the geometric modeling that works with 3D spatial operations. This paper presents a portion of the problems, which are 3D topological operations for DBMS. These operations are very important for 3D spatial analysis. This paper discusses implementation of a 3D data type (Polyhedron) and eight 3D topological relationships between polyhedrons. The relationships are compliant with the 4-intersection model, and it could be extended to 9-intersection model if the exterior component is considered. The implementations are tested for PostgreSQL.