
Multi-Resolution Geospatial Data in Mobile System

Follin Jean-Michel, Bouju Alain, Bertrand Frédéric, Boursier Patrice

Laboratoire Informatique, Image, Interaction, Université de La Rochelle
E-mail:jean-michel.follin@univ-lr.fr

Abstract

Geographic Information Systems (GIS) have to support multi-resolution data in order to represent the real world at different scales. This need is also observed in the emerging field of mobile GIS. In this paper, we propose solutions for the management and visualization of multi-resolution vector data in a mobile spatial information visualization system. We first review the basic principles of mobile GIS and management of multi-resolution data, and we mention various works that have already been conducted in the areas pertaining to our own research and development works. We then present the client-server architecture and the management approach adopted in the system. Our aim is to reduce the amount of data exchanged between the client and the server. Our solution is based on the use of increments in a multiscale database. In our database architecture, datasets for different predefined scales are precomputed and stored on the server side. Increments correspond to the difference between two datasets with different resolutions and are transmitted in order to increase or decrease the level of detail of information on the client upon request. They allow reusing data which are already present on the client side. They imply to take into consideration the different generalization operators, their mapping configurations and their modifications on objects representations. Finally, we describe our approach for presenting multi-resolution data: an adapted one relying on “intelligent zoom”. It consists in measuring the density of data at different resolutions and for different scales, and finding a balanced solution taking account of resolution and scale which respects the well-known “principle of constant density of data”.

Keywords

Multi-Resolution Data, Client-Server, Embedded System, Mobile GIS
