

A Study on the Multi-dimensional and Dynamic Cartographic Modeling for the Geographical Environment

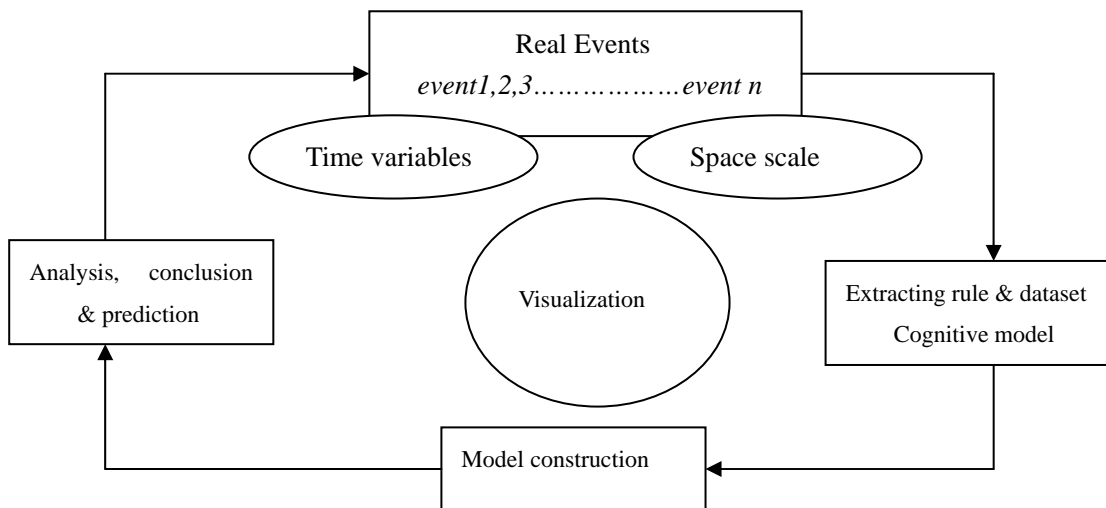
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Abstract

The geographical environment system has the characteristics of the multiple time and space scale, structural complexity, stochastic and non-linear dynamics. The simulation and visualization of geographical dynamic processes should be concentrated on the analysis of the basic characteristics of spatio-temporal processes and established their multi-dimensional and dynamic cartographic modeling. In this paper, the geographical environment was classified as several categories based on the following model (see diagram).



The category that could not be process-based simulated (could not find the basic rule and construct the simulated dataset). The Snapshot, BSA, STC and ESTMD models are suggested for the geographical environment cartographic modeling of this category, indicating their certain states with certain time.

The category that could be process-based simulated (could find the rule and be simulated by the mathematic model or other analytical model). ESTMD, PDTM and feature-based spatial-temporal model are suggested for the mapping, indicating their dynamic state changes.

In the paper, the new multidimensional dynamic model (IMDCM) is constructed after the above models were evaluated and their possible integration was explored. Based on the model, 2D/3D dynamic cartographical modeling system modules are designed by integration of raster /vector data and multimedia information.