Table of Contents

Views of Operations in GIS

Toward a Network Map Algebra 1
Marc P. Armstrong and Paul J. Densham

Higher Order Functions Necessary for Spatial Theory Development 11
Andrew U. Frank

Integrating Traditional Spatial Models of the Environment with GIS 23
Karen K. Kemp

Understanding Transformations of Geographic Information 33
Nicholas Chrisman

Animation and Urban Change

The Augmented Scene: Integrating the Map and the Environment 42
James E. Mower

Improving Moving Maps: A System for Feature Selection Based on a New Cognitive Model 52
Paul Van Zuyle

Using Space/Time Transformations to Map Urbanization in Baltimore/Washington 56
Lee DeCola

Modeling Urban Dynamics with Artificial Neural Networks and GIS ... 66
Chris Weisner and David Cowen

Classification

An Evaluation of Classification Schemes Based on the Statistical Versus the Spatial Structure Properties of Geographic Distributions in Choropleth Mapping 76
Robert G. Cromley and Richard D. Mrozinski

Mapping Multivariate Spatial Relationships from Regression Trees by Partitions of Color Visual Variables 86
Denis White and Jean C. Sifneos

How Many Regions? Toward a Definition of Regionalization Efficiency 96
Ferko Csillag and Sandor Kabos

Reasoning-Based Strategies for Processing Complex Spatial Queries 106
Ilya Zaslavsky

Vision and Spatial Relationships

Spatial Metephors for Visualizing Information Spaces 116
Andre Skupin and Barbara P. Buttenfield

GIS Icon Maps **126**
Micha I. Pazner and Melissa J. Lafreniere

Data Models

Spatial Data Models in Current Commercial RDBMS **136**
Matthew McGranaghan

A Systematic Strategy for High Performance GIS **145**
Liujian Qian and Donna Peuquet

Development of a Common Framework to Express Raster and Vector Datasets **155**
J. Paul Ramirez

Geometric Algorithms

Medial Axis Generalization of Hydrology Networks **164**
Michael McAllister and Jack Snoeyink

Visualizing Cartographic Generalization **174**
Robert McMaster and Howard Veregin

Student Paper Competition

Cartogarphic Guidelines on the Visualization of Attribute Accuracy **184**
Michael Leitner and Barbara P. Buttenfield

Exploring the Life of Screen Objects **195**
Sabine Timpf and Andrew Frank

Shape Analysis in GIS **204**
Elizabeth A. Wentz

Linear-Time Sleeve-Fitting Polyline Simplification Algorithms **214**
Zhiyuan Zhao and Alan Saalfeld

Public Participation GIS

Public Participation Geographic Information Systems **224**
Timothy Nyerges, Michael Barndt, and Kerry Brooks

Exploring the Solution Space of Semi-Structured Spatial Problems Using Genetic Algorithms **234**
David A. Bennett, Greg A. Wade, and Marc P. Armstrong

A Public Participation Approach to Charting Information Spaces **244**
Paul Schroeder

GIS, Society, and Decisions: A New Direction with SUDSS in Command? **254**
T. J. Moore

Generalization

Data Quality Implications of Raster Generalization **267**
Howard Veregin and Robert McMaster

Automatic Iterative Generalization for Land Cover Data **277**
Olli Jaakkola

Efficient Settlement Selection for Interactive Display **287**
Marc van Kreveld, Rene van Oostrum, and Jack Snoeyink

Digital Libraries

Exploratory Access to Digital Geographic Libraries **297**
Vincent F. Shenkelaars and Max J. Egenhofer

An Interactive Distributed Architecture for Geographical Modeling **307**
Greg A. Wade, David Bennett, and Raja Sengupta

Topological Processing

No Fuzzy Creep! A Clustering Algorithm for Controlling Arbitrary Node Movement **317**
Francis Harvey and Francois Vauglin

Maintaining Consistent Topology Including Historical Data in a Large Spatial Database **327**
Peter van Oosterom

Simple Topology Generation from Scanned Maps **337**
Christopher Gold

Projections and Global Tessalations

New Map Projection Paradigms **347**
Alan Saalfeld

Global Scale Data Model Comparison **357**
A. Jon Kimerling, Kevin Sahr, and Denis White

Digital Map Generalization Using a Hierarchical Coordinate System ... **367**
Geoffrey Dutton

Terrain Models and Algorithms

An Evaluation of Fractal Surface Measurement Methods Using ICAMS377
Nina Siu-Ngan Lam, Hong-lie Qui, and Dale Quattrochi

Simulating and Displaying Surface Networks **387**
Falko T. Poiker and Thomas K. Poiker

The Problem Contour in the Generation of Digital Topographic Maps . **397**
Silvania Avelar

Global Change

A Method for Handling Data that Exhibit Mixed Spatial Variation **404**
Bheshem Ramlal and Kate Beard

Demography in Global Change Studies **416**
Waldo Tobler

Interpolation Over Large Distances Using Spherekit 419
Robert Raskin, Chris Funk, and Cort Willmott

Society and GIS

Will Concern for Equity be a Defining Trend in LIS/GIS in the Next Decade?..... 429
David L. Tulloch, Bernard J. Niemann, Jr., and Earl F. Epstein