

Call for Chapters

Publisher: CRC Press (Taylor & Francis Group)

Title: Spatial Intelligence: Designing Composite Indexes through Geocomputation - Principles, Methods, Challenges, and Solutions

Editors:

- Dr. Hamid Rabiei, School of History and Geography, Dublin City University (DCU)
- Dr. Matheus Pereira Libório, Montes Claros State University
- Professor Chris Brunsdon, Department of Geography, Maynooth University

Contact: hamid.rabiei555@gmail.com

About This Book

Spatial composite indexes are crucial for synthesizing complex, multidimensional data into a single, interpretable value, making them indispensable in various fields, including urban planning, environmental management, and public health. In today's data-driven world, geocomputation has become an essential tool for extracting valuable insights from spatial data. This book with CRC Press (Taylor & Francis Group) will explore the core principles, methods, and real-world applications of spatial composite indexes, offering a comprehensive guide to advanced spatial analysis.

This book is being written to address the significant challenges in designing and applying spatial composite indexes, from data heterogeneity and scale issues to the complexity of integrating multiple variables. The process can be daunting even for experienced geocomputation practitioners, with obstacles including data availability and quality, variable selection, weighting and aggregation methods, spatial autocorrelation, and modifiable areal unit problems (MAUP).

The book will be written as a structured learning resource with step-by-step guides to principles and methods for constructing spatial composite indexes, enriched with real-world case studies. It will provide detailed explanations of advanced geocomputation tools and techniques, practical exercises, and examples to solidify understanding while highlighting cutting-edge challenges and delivering actionable solutions.

Call for Chapter Contributions

We invite scholars, researchers, and practitioners to contribute chapters to this comprehensive edited volume. We are seeking original, high-quality contributions that advance the field of spatial composite index design and geocomputation.



Indicative Target Chapters and Topics

Table of Contents

Section 1: Introduction

Chapter 1: Introduction to Spatial Intelligence

Abstract

- 1.1 Introduction
- 1.2 Definition and Importance of Spatial Intelligence
- 1.3 History and Overview of Composite Indexes
- 1.4 Applications of Spatial Composite Indexes in Various Fields (Case Examples)
- 1.5 Structure of the Book
- 1.6 Conclusion

Chapter 2: Theoretical Foundations

Abstract

- 2.1 Introduction
- 2.2 Key Concepts in Spatial Analysis
- 2.3 Principles of Geocomputation
- 2.4 Spatial Data Types and Sources
- 2.5 The Role of Space and Geocomputation/ GIS in Composite Indexes Development
- 2.6 Conclusion

Chapter 3: Designing Composite Indexes

Abstract

- 3.1 Introduction
- 3.2 Identifying Objectives and Research Questions
- 3.3 Selection of Indicators
- 3.4 Methods and Considerations
- 3.5 Normalization Techniques
- 3.6 Conclusion

Section 2: Data



Chapter 4: Data Collection and Preparation

Abstract

- 4.1 Introduction
- 4.2 Sources of Spatial Data
- 4.3 Types of Spatial Data
- 4.4 Spatial Datasets
- 4.5 Data Quality Assessment
- 4.6 Data Integration and Cleaning
- 4.7 Addressing Missing Data
- 4.8 Conclusion

Chapter 5: Big Data and Spatial Composite Indexes

Abstract

- 5.1 Introduction
- 5.2 Defining Big Data in Spatial Contexts
- 5.3 The Role of Big Data in Composite Index Construction
- 5.4 Tools and Technologies for Big Data Processing
- 5.5 Case Studies: Big Data Applications in Spatial Analysis
- 5.6 Challenges of Using Big Data to Design Spatial Composite Indexes
- 5.7 Conclusion

Section 3: Methods

Chapter 6: Benefit of the Doubt

Abstract

- 6.1 Introduction
- 6.2 Key Concepts
- 6.3 Method
- 6.4 Application Example
- 6.5 Conclusion

Chapter 7: Ordered Weighted Averaging Operator

- 7.1 Introduction
- 7.2 Key Concepts
- 7.3 Method
- 7.4 Application Example



7.5 Conclusion

Chapter 8: Geographically Weighted Principal Component Analysis

Abstract

- 8.1 Introduction
- 8.2 Key Concepts
- 8.3 Method
- 8.4 Application Example
- 8.5 Conclusion

Chapter 9: Geographically Weighted Clustering

Abstract

- 9.1 Introduction
- 9.2 Key Concepts
- 9.3 Method
- 9.4 Application Example
- 9.5 Conclusion

Chapter 10: Geographically Weighted Entropy

Abstract

- 10.1 Introduction
- 10.2 Key Concepts
- 10.3 Method
- 10.4 Application Example
- 10.5 Conclusion

Chapter 11: Geographically Weighted Equal Weights

Abstract

- 11.1 Introduction
- 11.2 Key Concepts
- 11.3 Method
- 11.4 Application Example
- 11.5 Conclusion

Chapter 12: Geographically Weighted Expert Opinions



- 12.1 Introduction
- 12.2 Key Concepts
- 12.3 Method
- 12.4 Application Example
- 12.5 Conclusion

Chapter 13: Spatial Benefit-of-the-Doubt

Abstract

- 13.1 Introduction
- 13.2 Key Concepts
- 13.3 Method
- 13.4 Application Example
- 13.5 Conclusion

Chapter 14: Ordered Geographically Weighted Averaging

Abstract

- 14.1 Introduction
- 14.2 Key Concepts
- 14.3 Method
- 14.4 Application Example
- 14.5 Conclusion

Chapter 15: Raster-Based Models

Abstract

- 15.1 Introduction
- 15.2 Key Concepts
- 15.3 Method
- 15.4 Application Example
- 15.5 Conclusion

Chapter 16: Fuzzy Geographically Weighted Clustering

- 16.1 Introduction
- 16.2 Key Concepts
- 16.3 Method
- 16.4 Application Example
- 16.5 Conclusion



Section 4: Conclusion

Chapter 17: Challenges in Designing Spatial Composite Indexes

Abstract

- 17.1 Introduction
- 17.2 Data Availability and Quality Issues
- 17.3 Multicollinearity and Redundancy in Variables
- 17.4 Spatial Autocorrelation and MAUP
- 17.5 Aggregation Techniques
- 17.6 Sensitivity Analysis
- 17.7 Reliability Testing
- 17.8 Interpretability and Communication of Results
- 17.9 Ground Truthing
- 17.10 Conclusion

Chapter 18: Solutions and Best Practices

Abstract

- 18.1 Introduction
- 18.2 Addressing Data Limitations
- 18.3 Techniques for Robust Index Design
- 18.4 Engaging Stakeholders in the Process
- 18.5 Continuous Improvement and Adaptation
- 18.6 Conclusion

Chapter 19: Software and Platform Design and Development

Abstract

- 19.1 Introduction
- 19.2 Interfaces and Dashboards
- 19.3 Visualizations Mapping
- 19.4 Quality Measures Panels
- 19.5 Open-Source Software and Platforms
- 19.6 Conclusion

Chapter 20: Future Directions

- 20.1 Introduction
- 20.2 Emerging Trends in Geocomputation



- 20.3 Innovations in Spatial Data Collection
- 20.4 Multidimensional Spatial Composite Indicators
- 20.5 The Role of Machine Learning and AI
- 20.6 Policy Implications and Recommendations
- 20.7 Conclusion

Chapter 21: Conclusion

Abstract

- 21.1 Introduction
- 21.2 Summary of Key Findings
- 21.3 The Future of Spatial Composite Indexes
- 21.4 Conclusion

Appendices

- A. Glossary of Terms
- B. Recommended Resources and Further Reading
- C. Data Sources and Tools

Submission Guidelines

Chapter Requirements:

- Length: 3,000-5,000 words (including references)
- Format: Academic chapter format with clear structure
- Content: Original research, comprehensive reviews, or innovative methodological approaches
- Case Studies: Real-world applications and examples strongly encouraged
- **Technical Content:** Include practical examples, code snippets, or methodological frameworks where appropriate

What We're Looking For:

- Theoretical Contributions: Novel frameworks or conceptual advances
- Methodological Innovations: New approaches to spatial composite index design
- Practical Applications: Real-world case studies demonstrating implementation
- Technical Solutions: Software tools, platforms, or computational approaches
- Critical Analysis: Examination of challenges and limitations in current practices
- Future Perspectives: Emerging trends and research directions



Submission Process:

- 1. Abstract Submission: Submit a 500-word abstract outlining your proposed chapter
- 2. Full Chapter: Upon acceptance of abstract, submit complete chapter
- 3. Peer Review: All chapters will undergo rigorous peer review
- 4. **Revision:** Authors may be asked to revise based on reviewer feedback

Important Dates

Abstract Submission Deadline: 30 January 2026

Full Chapter Submission: 30 July 2026

Review Completion: 30 October 2026

Final Manuscript Submission: 30 December 2026

Expected Publication: ~31 July 2027

Target Audience

This book is designed for:

- Graduate students and researchers in geography, urban planning, and environmental studies
- GIS professionals and spatial analysts
- Policymakers and practitioners working with spatial data
- Software developers creating geospatial applications
- Anyone interested in advanced spatial analysis and composite index construction

How to Submit

Please send your abstract and a brief biographical note to:

Dr. Hamid Rabiei

School of History and Geography
Dublin City University (DCU)

Email: hamid.rabiei555@gmail.com

Include in your submission:

- Chapter title and proposed chapter number
- 500-word abstract
- Brief author biography (150 words)



- Institutional affiliation and contact information
- Any relevant previous publications or experience

Questions?

For questions about the book project, chapter requirements, or submission process, please contact the editorial team at: hamid.rabiei555@gmail.com.

We look forward to receiving your contributions to this important volume on spatial intelligence and composite index design through geocomputation.