

User's Guide for the GIS&T Body of Knowledge, 2023

The Living Textbook <https://gistbok-ltb.ucgis.org> <https://gistbok-ltb.ucgis.org/page/10/dashboard>

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Welcome to the "GIS&T Body of Knowledge - Master - 2023" study area. [Open map](#)

This Body of Knowledge documents the domain of geographic information science and its associated technologies (GIS&T). By providing this content in a new digital format, UCGIS aims to continue supporting the GIS&T higher education community and its connections with the practitioners, employers, and clients who comprise the increasingly diverse collection of GIS&T professionals.

This study area has:

- 414 topics
- 1002 tags
- 745 relations
- 3989 references
- 1688 learning outcomes

Search for topic or instance

Select one... [Search](#)

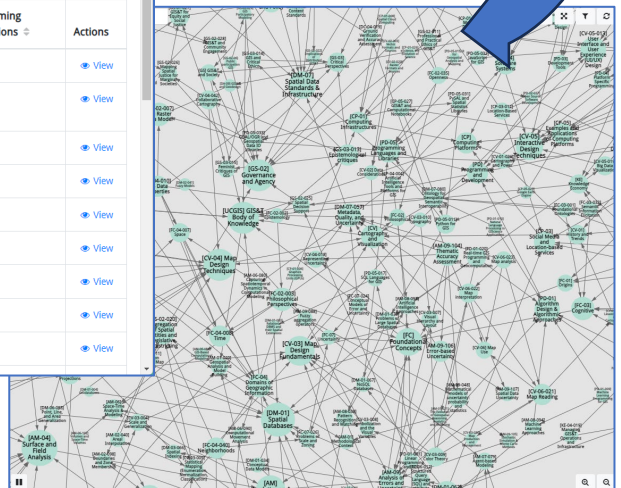
University Consortium for GEOGRAPHIC INFORMATION SCIENCE

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Topic list

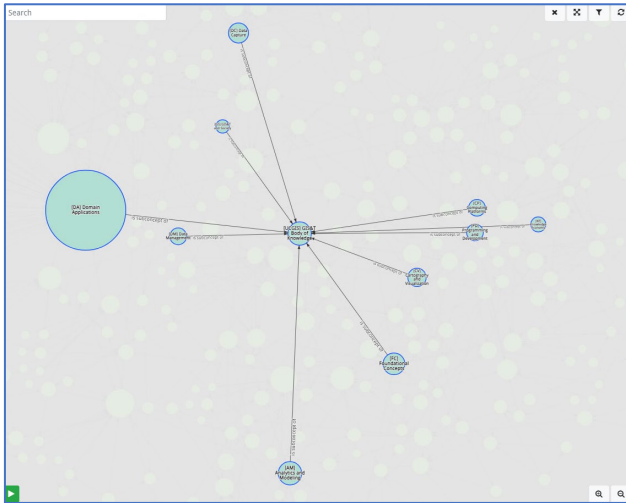
Show 25 records Search:

Name ↕	Instance	Outgoing relations	Incoming relations	Actions
[AM-01-020] Geospatial Analysis and Model Building	✘	1	3	View
[AM-01-021] The Evolution of Geospatial Reasoning, Analytics, and Modeling	✘	1	1	View
[AM-01] Methodological Context	✘	1	2	View
[AM-02-003] Buffers	✘	3	3	View
[AM-02-004] Overlay	✘	2	4	View
[AM-02-006] Grid Operations and Map Algebra	✘	3	3	View
[AM-02-009] Classification and Clustering	✘	3	4	View
[AM-02-040] Areal Interpolation	✘	3	0	View
[AM-02-098] Boundaries and Zone Membership	✘	1	2	View



The UCGIS GIS&T Body of Knowledge (2023 edition) can be accessed via an ordered list of its topics or a dynamic map (a knowledge graph) that illustrates its relationships.

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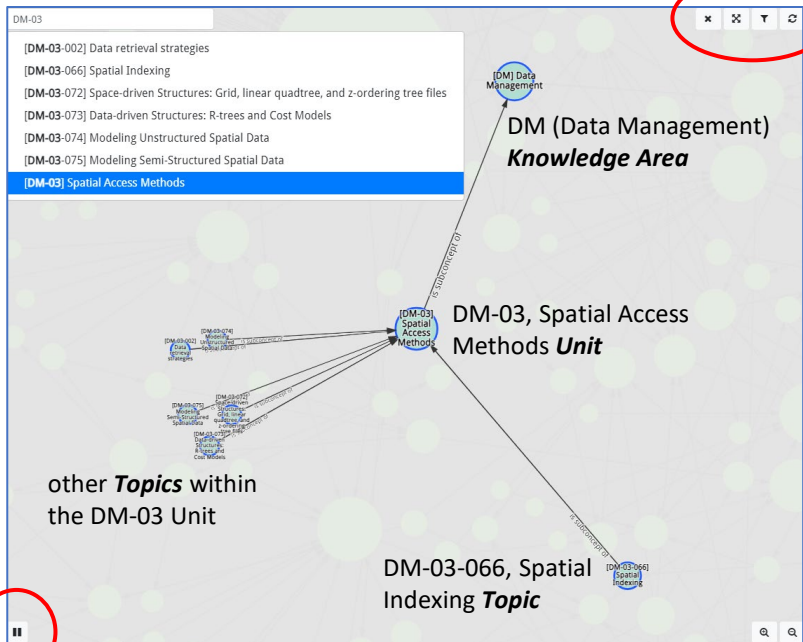


All individual Topics are organized within 10 coded Knowledge Areas and Units.

- AM = Analytics and Modeling
- CP = Computing Platforms
- CV = Cartography & Visualization
- DA = Domain Applications
- DC = Data Capture
- DM = Data Management
- FC = Foundational Concepts
- GS = GIS&T and Society
- KE = Knowledge Economy
- PD = Programming & Development

The map can be closed, XX, filtered, or refreshed.

Responsive searching facilitates discovery.



The codes indicate the hierarchical level positions within the BoK. Units are used for organizational purposes only and currently contain no descriptive text.

The dynamic movement of the map can be paused.

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Topics can be viewed and selected via the dynamic knowledge graph as well.

Tags are keywords linked across Topics

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[AM-01-020] Geospatial Analysis and Model Building

Spatial modeling is an important instrument to conduct geospatial analysis to understand the world and guide decision-making. In GIS, spatial models are formal languages to express mechanisms of geographic processes and design analytical workflows to understand these processes. With the development of GIS and computer science, various types of spatial models and modeling techniques have become available, which endows the term of "spatial model" with different meanings. This entry provides an overview of common types of spatial models, modeling techniques, and related applications.

Tags

dynamic models Model Builder process models spatial models

Introduction

Qiang, Y. (2021). Geospatial Analysis and Model Building. The Geographic Information Science & Technology Body of Knowledge (1st Quarter 2021 Edition), John P. Wilson (Ed.). DOI: [10.22224/gistbok/2021.1.12](https://doi.org/10.22224/gistbok/2021.1.12).

Definition

1. Definitions
2. Introduction
3. Taxonomy of Models
4. Common Types of Spatial Models
5. Techniques for Model Building
6. Conclusion

1. Definitions

Agent Based Model (ABM): a dynamic model with a collection of autonomous decision-making agents moving in a virtual environment.

Artificial Intelligence (AI): the study and design of machines or computational methods that can perform tasks that normally require human intelligence.

Artificial Neural Network (ANN): a computer algorithm that emulates a biological neural network to conduct regression and classification tasks.

Cellular Automata (CA): a collection of "colored" cells on a grid that evolves through discrete time steps based on the neighborhood's conditions.

Multicriteria Decision-Making Analysis (MCDA): an analysis method that evaluates multiple conflicting criteria to support decision making.

The DOI is linked to the Topic in the Visualization platform.

Definitions currently within an individual Topics are being migrated into a glossary linking terms across all Topics.