## Current Topics in the Geographic Information Science & Technology Body of Knowledge

### Origins
- Public & Private Sector Origins
- Academic developments
- Intro to the GIS&T BoK

### Cognitive
- The Power of Maps and Mapping
- Place and Landscape
- Foundational Ontologies
- Perceptions & Cognitive Processing
- Ontologies for Analysis
- Semantic Information Elicitation

### Domains of Geographic Info
- Space
- Time
- Space-Time Relationships
- GIS Data Properties
- Networks
- Neighborhoods

### Philosophical
- Openness
- Epistemology
- Philosophical Perspectives

### GIS&T Workforce
- GIS&T Workforce Development
- Competence in Knowledge Work
- GIS&T Positions and Qualifications
- GIS&T Education & Training
- Professional Certification

### Design & Implementation
- The Process of GIS&T Design
- Strategic Planning for GIS Design
- Project Planning & Management
- Measuring GIS ROI
- Managing Infrastructure & Operations

### Data Capture (DC)
- Remote Sensing Platforms/Sensors
- Remote Sensing Platforms Overview
- Nature of Multispectral Images
- Unmanned Aerial Systems
- LandSat
- Light Detection & Ranging (LiDAR) Basics
- Hyperspectral Imagery
- Airborne LiDAR Bathymetry
- Thermal Imagery

### Data Sources & Capture Methods
- Historical Paper Maps
- Aerial Photos: History & Georeferencing
- Processing Remotely-Sensed Data
- Street-Level Imagery
- Social Media Platforms
- Mobile Applications
- Texts
- Volunteered Geographic Info (VGI)
- Time-of-Arrival Localization

### Field Data Collection
- Sampling: Size, Selection, Types
- Field Data Capture Technologies
- U.S. Census Data

### Domain Applications (DA)
- Agriculture
- Archaeology
- Architecture
- Business
- Civil Engineering
- Climate Studies & Atmos. Science
- Computational Geography
- Conservation
- Criminal Justice / Law Enforcement
- Digital Humanities
- Insurance
- Intelligence & National Security
- International Affairs
- Land Administration
- Landscape Architecture
- Libraries, Archives, and Museums
- Local Government
- Marine Science
- Marketing
- Natural Resource Management
- Politics
- Public Health
- Public Policy
- GIS&T Body of Knowledge
- 9/30/2022
- revised & expanded
- future or forthcoming
- https://gistbok.ucgis.org
Current Topics in the Geographic Information Science & Technology Body of Knowledge

Data Management (DM)

- Spatial Databases
  - Spatial Database Mgmt Systems
  - Relational DBMS and Extensions
  - Geodatabases
  - Topological Relationships
- Database Administration
  - Conceptual Data Models
  - Logical Data Models
  - Physical Data Models
  - Array Databases
  - NoSQL databases
- Geospatial Access Methods
  - Spatial Data Retrieval Strategies
  - Spatial Indexing
  - Space-driven Structures
  - Modeling Unstructured Spatial Data
  - Modeling Semi-structured Spatial Data

Data Manipulation

- Georeferencing Systems
  - Linear Referencing
  - Earth's Shape, Sea Level, Geoid
  - Geographic Coordinate Systems
  - Planar Coordinate Systems
  - U.S. National Grid
  - Vertical (Geopotential) Datums
  - Horizontal (Geometric) Datums

Data Standards & Interfaces

- Data Manipulation
  - Point, Line, Area Generalization
  - Vector-to-Raster and R-V Conversions
  - Raster Resampling
  - Coordinate Transformations
  - Transaction Management

Data Standards & Interfaces

- U.S. National Spatial Data Infrastructure
  - Geospatial Content Standards
  - Spatial Data Warehouses
  - Spatial Data Infrastructures
  - U.S. National Spatial Data Infrastructure

Cartography & Visualization (CV)

- Map Design Techniques
  - Common Thematic Map Types
  - Multivariate Mapping
  - Spatio-Temporal Representation

- Map Design Fundamentals
  - Scale & Generalization
  - Statistical Mapping
  - Map Projections
  - Visual Hierarchy & Layout
  - Symbolization & Visual Variables
  - Color Theory
  - Typography
  - Design and Aesthetics
  - Map Production & Management

- Interactive Design Techniques
  - User Interface & User Experience (UI/UX)
  - Web Mapping
  - Virtual & Immersive Environments
  - Big Data Visualization
  - Mobile Maps & Responsive Design
  - Usability Engineering & Evaluation
  - Geovisual Analytics
  - Geovisualization

GIS&T Body of Knowledge

1/15/2024

- bold = revised & expanded
- regular = original & still limited
- italics = future or forthcoming

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