

GIST 4302/5302: Spatial Analysis and Modeling

Review

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<http://www.spatial.ttu.edu>

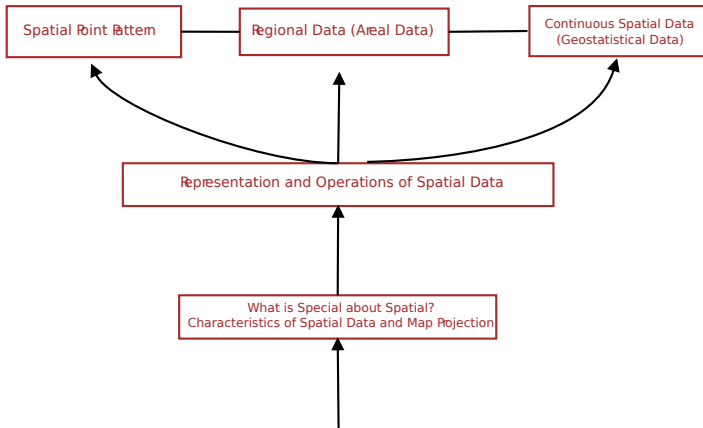


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Course Outlines





Map Projection

- Elements in map projection
 - datum
 - developable surface
 - projection
- Distortions
 - distance
 - shape
 - area
 - direction
- how to choose map projections?
 - depending on purposes, you may need to preserve a certain spatial property - most commonly shape or area - to achieve that purpose



What is special about spatial

Characteristics of spatial data

- spatial (auto/cross-)correlation (spatial context or spatial pattern in different context)
- spatial heterogeneity
 - Simpson paradox in a spatial setting
- fractal behaviors
 - scale issues
 - measuring the length of coastline of Maine
 - travel traces of 'ants' vs. 'elephant'



Spatial Data Types

Data types

- spatial point pattern
- areal data
- geostatistical data
- network data



Representations of spatial data (i.e., spatial database basics)

- object-based
 - geometric primitives: points, lines and polygons
 - convex hull, Voronoi diagram (dual graph of Delaunay triangulation)
 - vector analysis
 - point-in-polygon
 - buffer
 - spatial query
 - overlay, spatial join
 - data structures for spatial data
 - spaghetti models
 - NAA



Representation of spatial data

Representations of spatial data (i.e., spatial database basics)

- field-based
 - representation: points, contours, raster/lattice, triangulation (Delaunay triangulation)
 - raster analysis:
 - local operators: map algebra
 - focal operators: focal statistics, aspect, slope
 - zonal operators: zonal statistics, viewshed, watershed analysis

Model builder

- automate processing, graphic programming, reproducibility

Geocoding

- converting human readable address to geographic coordinate pairs
- what could affect the geocoding results



Exam format

- Thursday 12:30-1:30pm
- open books and open notes, but access to any digital devices (e.g. phones, tables, computers) are not allowed
- multiple choices (multiple correct answers) plus writing questions



Thanks

Thank you, any questions/comments