Geospatial Data Integration

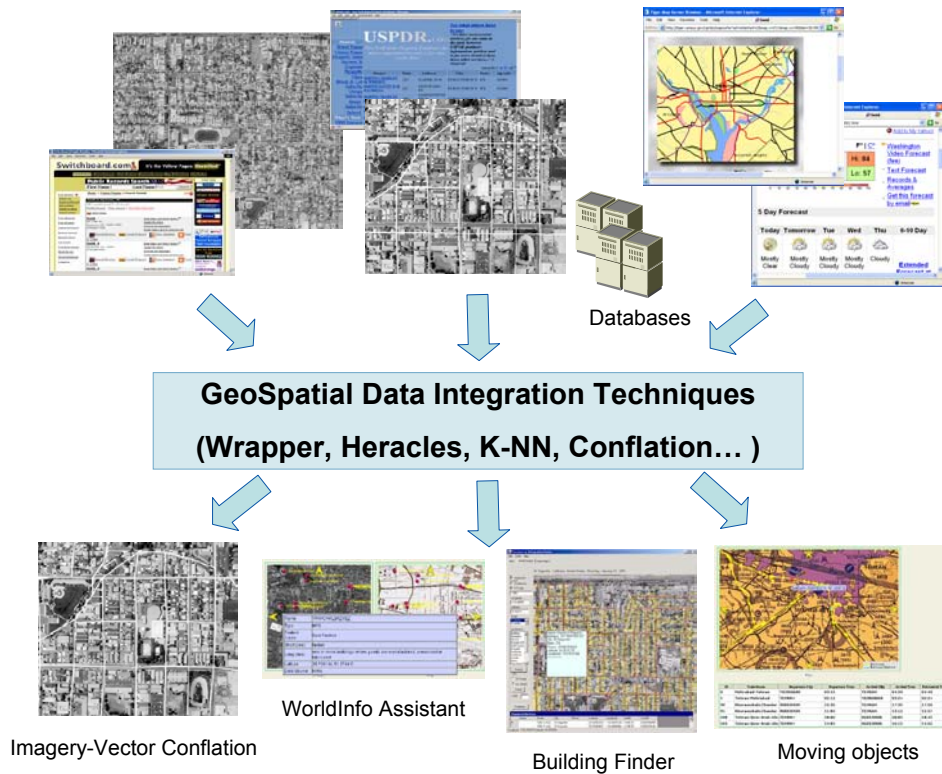Student: Mohammad-Reza Kolahdouzan, Snehal Thakkar, Mehdi Sharifzadeh , Ching-Chien Chen
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Goal: The main objective of this research area is to provide a transparent layer for retrieving and integrating data from several heterogeneous databases and online sources, such as spatial, temporal and textual data.

Role: At IMSC, several immersive environments, such as *2020Classroom* and *ImmersiNews*, require integration of various data (e.g., course-related material or news) form different data sources to provide rich content to the users.

Databases

GeoSpatial Data Integration Techniques
(Wrapper, Heracles, K-NN, Conflation…)

Imagery-Vector Conflation

WorldInfo Assistant

Building Finder

Moving objects

Research Approach:
- Wrapper : Query online data sources
- Heracles : Interactive data-driven constraint-based hierarchical planner
- Space Embedding: K nearest neighbor search and shortest-path finding
- Conflation : Efficient and automatic satellite imagery and vector data alignment

Accomplishments:
- The WorldInfo Assistant: Demonstrate integration of diverse open sources data (ICAI'01)
- Moving object application: Demonstrate efficient integration of spatial and temporal data (ACMGIS'01)
- K-Nearest Neighbor application (ACMGIS'02)
- Building Finder application: Automatically annotating and integrating spatial datasets(SSTD'03)

Five-Year Plan:
- Mobile version of WorldInfo Assistant
- Define and utilize spatial reasoning principles
- Build a general geospatial integration framework.
- Integration of final version of spatial-temporal integration techniques into RIMS and *2020Classroom*