

## **Service-Oriented Geographical Information System for Integration, Analysis and Visualization of Heterogeneous Data**

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*GEON is a cyberinfrastructure project involving information science specialist and geoscientists in a science-centric collaboration. Since geoscientists are the driving factor in the GEON project, the geospatial data have always been at the apex of GEON collaboration. Not only are the geospatial data and information geographically distributed, they are also in massively heterogeneous formats utilizing diverse data sharing protocols. To perform state-of-the-art information integration and visualization, GEON is using a Service-Oriented Architecture model on the grid infrastructure to solve the problem of syntactic and schematic heterogeneity, while using ontology based annotation to resolve the semantic differences in the data.*

*To perform information/data integration and visualization studies, we have created a state-of-the-art, service-oriented system that incorporates on the fly GIS mapping capabilities that assimilates the use of on-demand querying and visualization of data and maps using knowledge-based rendering techniques. Further, GEON is building ontology-based map integration of the spatial layers exposed by leading data providers, such as NASA and USGS, through the OGC compliant WMS and WFS services. Distributed interpolation and analysis of large LiDAR dataset is another avenue in which GEON is making use of parallel GIS and Terascale computing on the Grid.*