

Special Issue on
Geospatial Big Data Sensing, Modeling, and Machine Learning for Seismic Risk Reduction

CALL FOR PAPERS

As human population and urbanization grow globally, natural hazards as witnessed worldwide in recent years are contributing to societal and financial losses at an exponential rate. Among many natural hazards, geophysical and seismic related events, such as earthquakes, tsunamis, land-slides, and liquefaction, have impacted many populous and economic zones around the world, thereby leading to disastrous consequences. The growth in sensing, computing, and communication technologies has enabled the production of large volume of geospatial data at high-spatial and high-temporal resolutions as well as high-velocity in near real-time thanks to traditional and nontraditional remote sensors/satellites and manned or unmanned aerial vehicles. With the promise of real- or near-real-time geospatial big data (GeoBD) provided by different national agencies through their data access programs such as NASA's Land, Atmosphere Near Real-Time Capability for Earth-Observation Data (LANCE) program and other similar programs at European Space Agency and China National Space Administration, it is possible to deliver products of seismic hazard monitoring and mapping and risk and damage assessment more rapidly than ever. While these big data and technological advancements provide opportunities to achieve a "panorama-" like characterization of the life-cycle of a geophysical hazard event and its disastrous effects, research challenges still exist with regard to sensing, modeling, and forecasting at improved accuracy, robustness, and automation. These challenges call for innovation in developing methodologies that can take full advantage of geospatial big data through integrating physics and statistics based models, accounting for complexity and uncertainties, and implementing machine learning frameworks for enhanced automation, which ultimately enable seismic hazard risk reduction regionally and globally.

As part of this special call, we solicit both research and review articles that focus on the use of geospatial big data for seismic risk reduction.

Potential topics include but are not limited to the following:

- ▶ Innovative GeoBD sensing technologies (e.g., new space-/air-borne hyperspectral and radar sensors and space-borne video imaging)
- ▶ Physics-based modeling using radar, multi-/hyperspectral, and visual data and complexity theoretic interpretation of seismic hazard or disaster data (e.g., SAR data interferometry for ground motion monitoring; hyperspectral data based characterization of hydrometeorological event on earth surface)
- ▶ Machine learning methods for mining and learning new knowledge from GeoBD, including supervised, unsupervised, semisupervised, and transfer learning in either classical Bayesian or deep learning frameworks
- ▶ Innovative seismic hazard-severity and disaster-loss estimation and mapping methods, including digital change detection methods and their integration with modern machine learning methods
- ▶ GeoBD veracity, data cleansing, and standardization
- ▶ Uncertainty quantification in GeoBD or for GeoBD models: theoretic methods or applications

Authors can submit their manuscripts through the Manuscript Tracking System at <https://mts.hindawi.com/submit/journals/ijge/drrtg/>.

Papers are published upon acceptance, regardless of the Special Issue publication date.

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