

Mapping Open-Source Information to Support Crisis Management

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Crisis management activities inherently rely on geographical information. Geographical information abounds in open-source channels such as news stories. These channels implicitly contain numerous references to place (e.g., cities, countries) that are not readily accessible or viewable on maps. This information can support crisis management activity by helping, in part, to understand varied geographic reactions to a disaster event, develop post-event intelligence about what happened during a crisis and why, and aid in collection of information about hazard mitigation discussions underway in various locals.

The goal of the research reported is to develop a map-centric, visual analytic environment that can support crisis management activities through mapping of open-source information. A working web-portal version of this environment has been implemented and will be presented. Functionality developed to date centers around the automated retrieval of news stories based on a user-specified crisis context. Data retrieved is then computationally processed by extracting and visualizing geographic place names and possible relationships between places across user-defined geographic scales over time. Formal ontology's related to crisis concepts are used to find potentially relevant non-spatial dimensions within data retrieved. Concepts found are geographically contextualized by being anchored to the map locations of their corresponding news stories. Tightly coupled map displays allow the user to simultaneously view geographical locations found in 3D-realistic terrain and standard 2D cartographic perspectives. The unique advantage of this research is that the power of Google™ News, Maps, and Earth is harnessed in an integrated visualization system that can combine heterogeneous data sources to develop geographical knowledge. The public availability and ease of use these technologies afford makes the system available to a wide range of crisis management practitioners.

With our initial goal of extracting relevant content from news stories to visualize geographical and other forms of information now completed, it is possible to extend our research from a web-portal targeted to individual use to a portal that supports collaborative information retrieval and interpretation. Our goal with this research direction is to improve the effectiveness of teams to collaborate in crisis-oriented information synthesis activities by applying combined expertise to finding relevant information and to interpreting results of searches. A goal for the methods and tools presented is to contribute towards group awareness of the geospatial and temporal dimensions of situations within which people act and make decisions before, during, and after a crisis.

Publication related to this research:

Tomaszewski, Brian (2006), "Concept Discovery: Spatiotemporal Analytics, Visualization, and Knowledge Integration", <
http://www.geovista.psu.edu/resources/flyers/NEVAC_flyer_CDA.pdf >, (last accessed 24 January 2007).