VACCINE
Visual Analytics for Command, Control, and Interoperability Environments
A U.S. Department of Homeland Security Center of Excellence

SensePlace2

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Benefit: *Social media offer a rapidly growing potential source for time-critical information related to crises. But, extracting meaning from these large, messy, data sources is a challenge. SensePlace2 is a geovisual analytics application that forages the Twitterverse for relevant place-time-attribute information and supports crisis management through visually-enabled situaltional awareness and sensemaking using the information derived.*

For additional details about SensePlace2, please see:

www.geovista.psu.edu/SensePlace2

MacEachren A.M., Jaiswal A., Robinson A.C., Pezanowski S., Savelyev A., Mitra P., Zhang X., Blanford J. (2011) SensePlace2: GeoTwitter Analytics Support for Situational Awareness, *IEEE Conference on Visual Analytics Science and Technology*, Providence, RI, Oct 23-28, 2011.

Harnessing Twitter to support situational awareness and crisis management through geovisual analytics

Establishing and maintaining Situational Awareness is a fundamental requirement for effective crisis management. The information contained in social media has been recognized by the crisis management community (e.g., the August, 2010 Red Cross Emergency Social Data Summit) and by researchers in crisis informatics as a potentially rich source of time-critical information that can enhance situational awareness and alert practitioners to events and situations needing their attention. A quote from FEMA Director Craig Fugate is representative: "*I got better situational awareness [from Twitter] before we got official word.*" (quoted in CNN story, Sept. 22, 2010 1:13pm EDT).

We have applied a visual analytics perspective to develop and implement visually-enabled information foraging and sensemaking tools for leveraging data made publicly available in social media. SensePlace2 has been designed to integrate multiple text sources (e.g., news, RSS, blog posts). Our initial focus is on Twitter, the most widely used microblogging application. SensePlace2 uses a crawler to systematically query the Twitter API for tweets containing any topics deemed to be of interest. Each tweet is then processed and key information using computational text procssing methods (locations, organizations, persons, hashtags, URLs etc.) is extracted.

SensePlace2 is a map-based web application. The client application supports overview and detail maps of tweets in a Map, Timeline, and Place-tree view, place-time-attribute filtering of tweets, and analysis of changing issues and perspectives over time and across space as reflected in tweets. The default SensePlace2 interface (shown below) includes a query window, map, time-plot / control, relevance-ranked list of tweets, and task list. The primary display views (map, time-plot/control, and tweet list) are dynamically coordinated. The current SensePlace2 architecture and user interface reflect user input from a structured survey of emergency management practitioners.
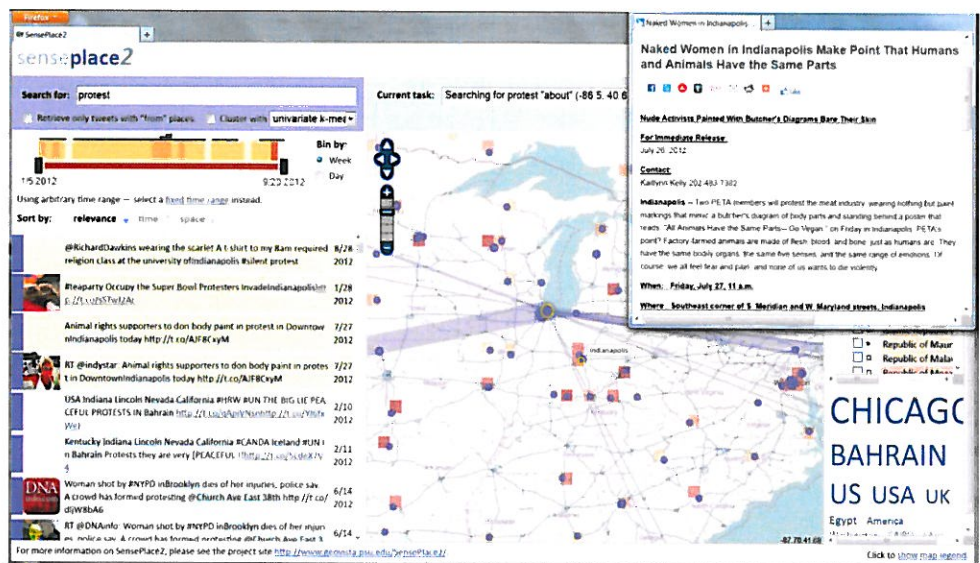
The session above began with a query on "protest". Then, a spatial constraint was added to find tweets related to protests closest to West Lafayette, IN. High frequencies of tweets are shown in dark red on the Map, Timeline, and Place-tree (mostly hidden by the second browser window). Cricles indicate concentration of the 1000 most relevant tweets. The circle for Indianapolis was clicked on, highlighting three tweets, two of which focus on an animal rights protest. A URL link led to the story about a PETA protest. A mouse-over on Chicago shows links to other locations mentioned in CHicago tweets.