Homeland Security
Science and Technology

Improving Disaster Response and Recovery: Social Media Analytics and Reporting Toolkit
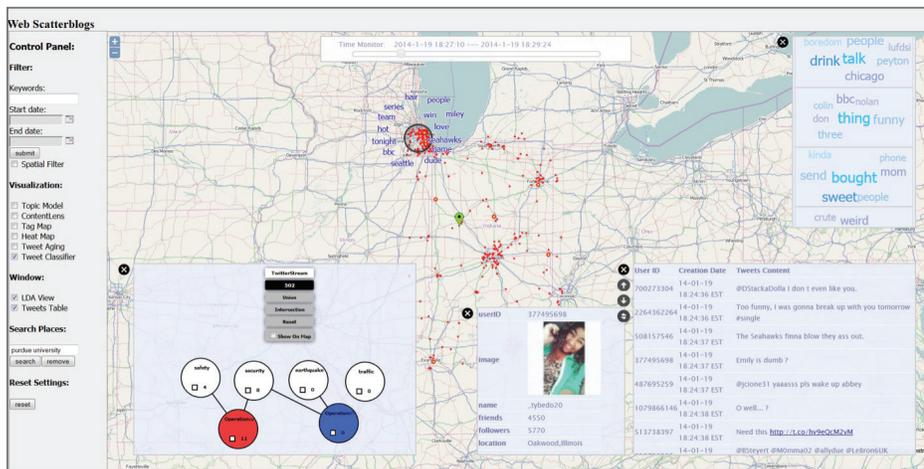## A DHS Science and Technology Center of Excellence

Analyzing Massive Social Media Data During Disasters

When a disaster strikes, the Internet is flooded with microblogs, tweets, Facebook messages, and other social media posts. If used correctly, this information can shape the way public safety agencies handle the response to and recovery from major events. However, the sheer volume of data makes it difficult for analysts to sift through and verify information in real time. Analysts require new methods to monitor targeted topics on social media platforms, identify trends and anomalies, and extract and use this information to improve decision-making during disasters.

Social Media Analysis System Enhances Time-Critical Decision-Making

Developed by the Center for Visualization and Data Analytics at Purdue University, a Department of Homeland Security (DHS) Science and Technology (S&T) Center of Excellence, **Social Media Analytics and Reporting Toolkit (SMART)** is a social media analysis system that provides analysts with scalable analysis and visualization of social media posts. The system uses topic extraction, combinations of key word filters, word cluster examination, and unusual event detection to provide situational awareness and improve decision-making for time-critical tasks.

SMART Provides Advantages to Analysts

Current tools for monitoring social media posts typically filter messages based on user-defined searches using specific keywords and parameters. Because social media posts constantly change, analysts must be able to track changes to avoid falling behind conversation threads or developing analyses based on old data.

SMART improves search and analysis capabilities by enabling the detection and exploration of anomalies. It enhances analysis of social media posts during a disaster in progress by comparing them to the historical information and trends of previous events, such as hurricanes and other natural disasters, terrorist attacks, and traffic.

These and other features are tightly integrated into a highly interactive visual analysis system that allows analysts to monitor and configure the methods for each analytical process.

Piloting SMART in the Field

Analysts used SMART as an early warning system during the 2013 Boy Scouts of America Jamboree in West Virginia to capture tweets related to a variety of events, including severe weather, security, safety, and health. The tool was able to identify a safety violation incident.

The Ohio State Highway Patrol and the U.S. Coast Guard are currently testing SMART. A number of police departments have also expressed interest in the tool.

Next Steps

SMART currently operates in a desktop version but is being developed into a Web-based tool. As field pilots continue, researchers will upgrade the system based on end-user feedback. The current focus has been on Twitter, but SMART can also incorporate data from Flickr and YouTube. Additional social media platforms are also being examined.

SMART includes message plots on a map, a topic view, a filter view, a stream categorization view, and a table for message content. It loads traffic, severe weather, power outage classifiers, and a combination of severe weather reports.