Interactive Visual Analytics for Situational Awareness of Social Media

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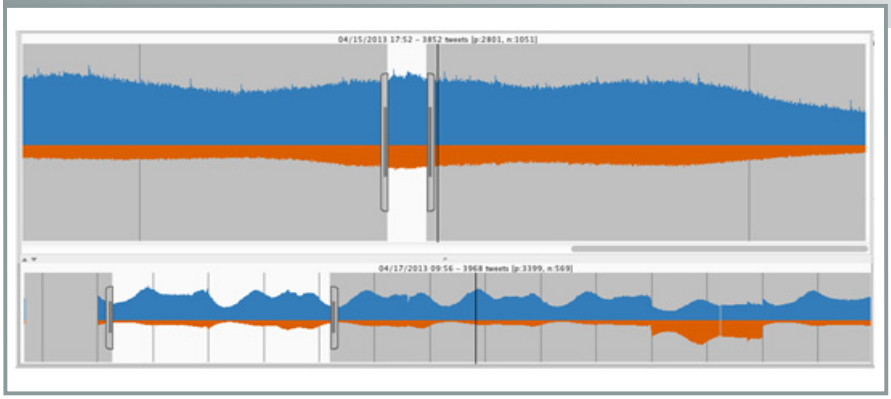

Technology Summary

With more than 140 million active users, Twitter produces about 340 million, 140-character posts each day. With smart phones in the hands of more than a billion people worldwide, virtual communities form rapidly on social media platforms like Twitter; these communities occasionally foster violence and unrest that is conveyed in the users' language. Techniques for analyzing broad trends over these networks or reconstructing conversations within small groups have been demonstrated in recent years but have not supported near real-time analysis of these large streams of information. ORNL researchers have developed a system to discover and interactively explore these virtual networks; detect sentiment such as fear, anger, or sympathy; highlight change and trends; and discover patterns within the network movements, such as use of certain hashtags.

The ORNL-developed system continuously monitors an online feed of randomly sampled public posts from Twitter and has accumulated hundreds of gigabytes of tweets spanning such international events as the Boston marathon bombings and Middle East conflicts. Researchers augment the sampled stream with additional filtered queries for specific geographical areas of interest and/or keywords to increase the volume of relevant data. In parallel, another automated service monitors and archives RSS news feeds from hundreds of sites, augmenting the social media data with an alternate source of event information. The combined efforts allow researchers to analyze social media activity on a global scale.

Effectively investigating such resources requires the ability to check the pulse of the information network and drill down to increasingly detailed perspectives in near real-time. Social media and other similar online streams of textual information represent a largely untapped resource for awareness and understanding of global events. Social media systems are credited with giving critical mass to larger movements—such as the London riots and the "Arab Spring" revolution, both in 2011—and are rapidly transforming public discourse and setting trends and agendas in politics, technology, journalism, and the environment.

Advantages

- Reveals key connections, associations, and anomalies in the social media world
- Provides near real-time processing of streaming content
- Supports analysis of social media at a global scale
- Combines the flexibility, creativity, and domain expertise of humans with the computational and storage capacities of machines in a visual analytics framework
- Provides the ability to understand and forecast the reaction of virtual communities to a given situation, especially when traditional media reports are limited because of hostilities or disasters

Potential Applications

- Disaster response, emergency management, global security, biosurveillance, and public policy
- Targeted product marketing and advertising

Patents

Chad A. Steed, Robert M. Patton, Paul Logasa Bogen, Thomas E. Potok, and Christopher T. Symons. *Interactive Visual Text Analytics for Situational Awareness of Social Media,* US Patent Application 61/892,169, filed October 17, 2013.

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