Twitris: Taking Crisis Mapping to the Next Level

techpresident.com/news/wegov/24082/twitris-taking-crisis-mapping-next-level

Twitris – the techy marriage of “Twitter” and “Tetris” – is a platform that aims to help civil society win the “game” of big data, creating layers and layers of analysis that provides a holistic picture of an event. The idea for Twitris was born out of the chaos of the terrorist attacks in Mumbai on January 26, 2008 when Amit Sheth and his team of PhD students at the Kno.e.sis center noted that social media users played a key role in feeding information to the media.

Kno.e.sis stands for the Ohio Center of Excellence in Knowledge-enabled Computing at Wright State University in Dayton and Sheth is the founder and director of the center where he oversees the Twitris project.

The platform uses algorithm-based technology to aggregate existing information on Twitter, Wikipedia, and news sites in order to provide a fuller picture of events, disaster scenarios, as well as political movements and campaigns. The Kno.e.sis team works closely with social scientists in order to understand behavior and what types of information would be useful to aggregate. They also work with civil society groups, like humanitarian organizations, to understand how this information can be effectively applied during a disaster to speed up aid delivery.

Crisis Mapping v. Twitris

Crisis Mapping emerged as early as 2004 after the massive Indian Ocean Earthquake and Tsunami devastated Aceh, Indonesia. It was also used in 2010 during the Haiti Earthquake. Patrick Meier, one of the key figures that coordinated the Haiti mapping project, used social media and crowdsourcing to display information on food distribution, sanitation, displacement and security. It was used again in 2011 to map the Japan Earthquake and even the progression of the Gaza-Israel War in 2012.

The key difference between Twitris and crisis mapping is that it provides the context and background to understand what is happening across social media and therefore, allows for a deeper analysis of online data. Hemant Purohit, a PhD candidate at Kno.e.sis and one of the Twitris developers, describes the platform's three key components as “people, content, and network analysis.”

In other words, to gain a comprehensive understanding of an event, Twitris first mines social media for relevant live

tweets. It then provides background information from sources like Wikipedia and news sites. Lastly, it analyzes interactions on social media to understand existing networks or a lack thereof.

“These three sets of information presented together give you a complete picture,” says Purohit. In a way, Twitris behaves like a more comprehensive version of a magic eight ball that provides critical answers during a crisis: What if there is an informal resource center that has been set up ten blocks away from a disaster victim who needs food and fresh water - how would the two connect? What if a humanitarian aid worker lands in Uttarakhand, India and needs to better understand the region to help those on the ground?

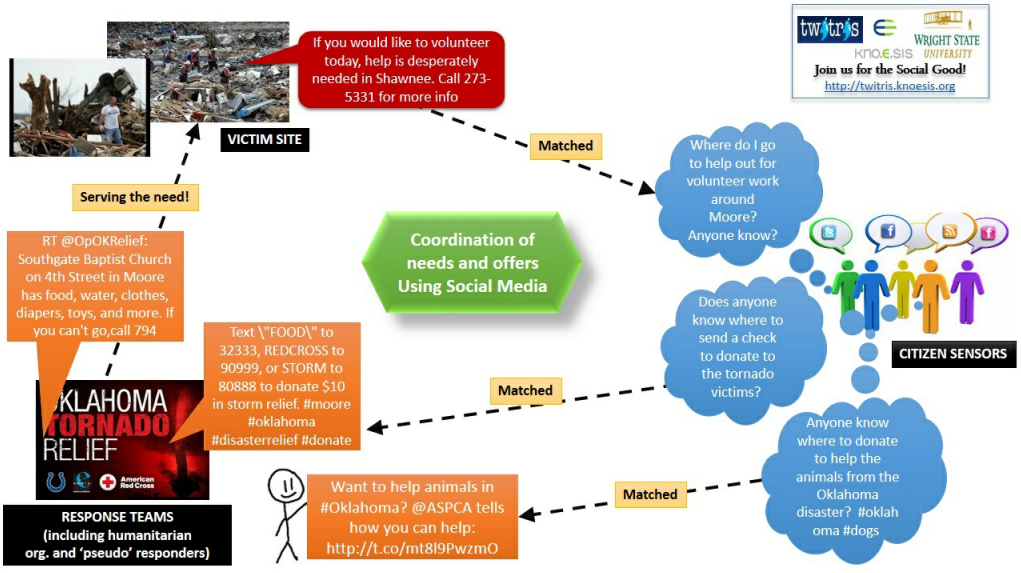
While the platform is still being refined, this human informed, algorithm-based technology has now been applied to a number of events.

Disaster Response

Sudden surges in social media activity often follow large events and disasters, most recently after a series of Tornadoes slammed Oklahoma. “You have all these people talking and some post very important information,” explains Purohit. “How do we mine these users? How do we represent these users in a meaningful way?”

Using an algorithm, based on the number of retweets, mentions and replies, the Kno.e.sis team used Twitris to find the top 100 most influential and well connected users of social media and list them on the site with their profile information. The top 100 often consist of professionals working across a variety of sectors: academia, media, humanitarian work, politics and medicine, for example. Twitris allows users to look at communication patterns among these “influencers,” allowing a humanitarian aid worker, for example, to quickly activate the help of this network and speed up emergency response during a crisis.

Twitris also enables social media users to interact more effectively with each other through a matching program, allowing one person in need to find resources being offered by another. However, the Kno.e.sis team is still working on creating a more effective matching program and to track the number of successful matches made so far.



ABOVE: Twitris helped match tweets calling out for donations to the Oklahoma disaster to those requesting donations. (image: http://twitris.knoesis.org/)

Twitris also allows users to see what is trending on social media, a useful tool for journalists to nab their next headline. It can also help disaster victims find aid. Purohit gleaned a number of help line numbers during the Oklahoma tornadoes by looking at the trending tweets. He then posted this information at the top of the Twitris site

page for easy access.

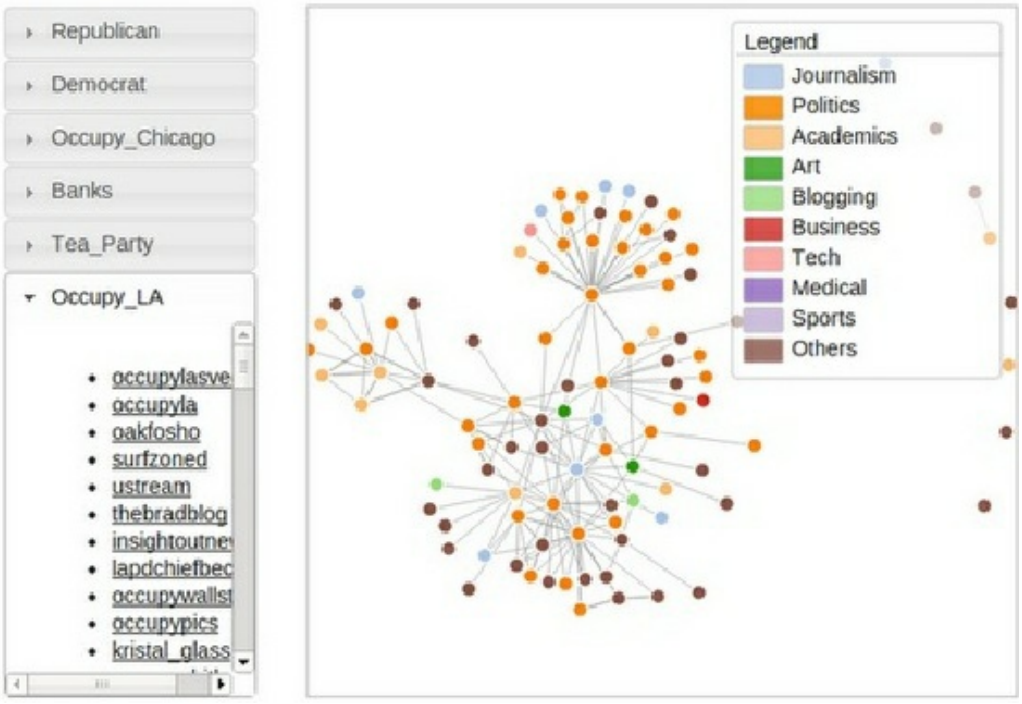
Trending topics can also point out answers to key questions. For example, why did northeast India suffer so severely from the recent floods? One of the trending topics noted: the monsoons came earlier than normal this year and the administration simply wasn't prepared for it.

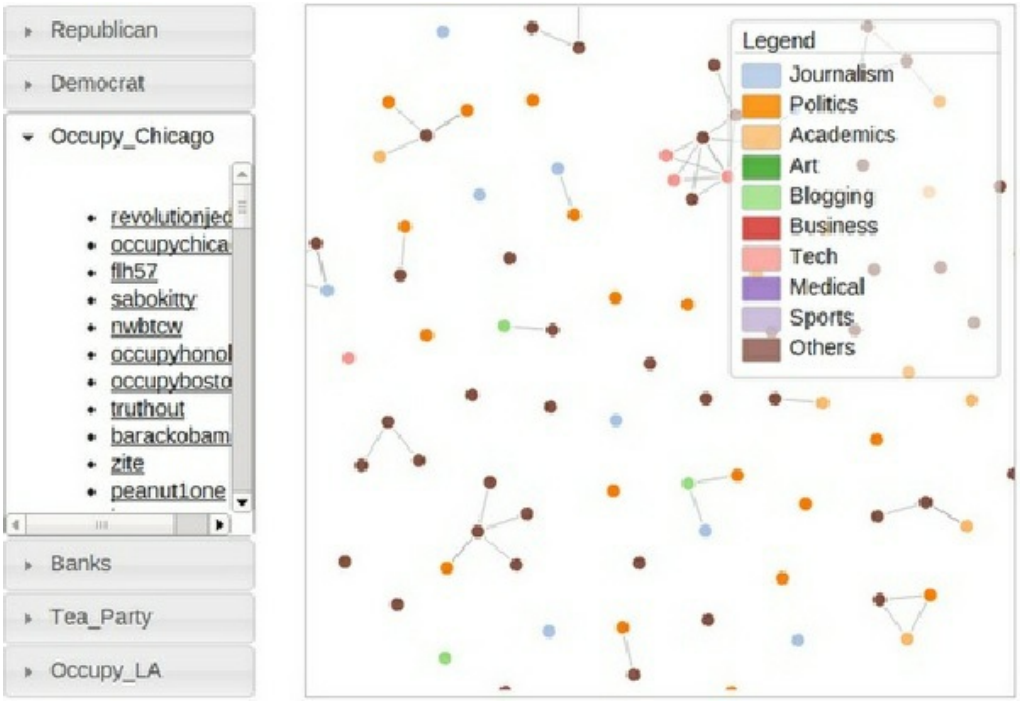
Finally, Twitris provides real time monitoring of tweets as they come in second by second. Flags appear on a map, showing the location of the tweets.

The Kno.e.sis team is hoping to work more closely with emergency responders in utilizing Twitris. They are currently working with Google Crisis Response on the floods in India and are also conducting a study with the National Center for Medical Readiness, one of the organizations that trains the air force. By the end of the year, Twitris hopes to understand how the air force's command control can use social media.

Political Movements and Campaigns

By analyzing social media, Twitris can provide a simple visualization of Occupy Wall Street's (OWS) performance, city by city. For example, Twitris revealed an interesting facet of the OWS movement in L.A. versus Chicago: While OWS L.A. organized and networked successfully, OWS Chicago did so on a much lesser extent.

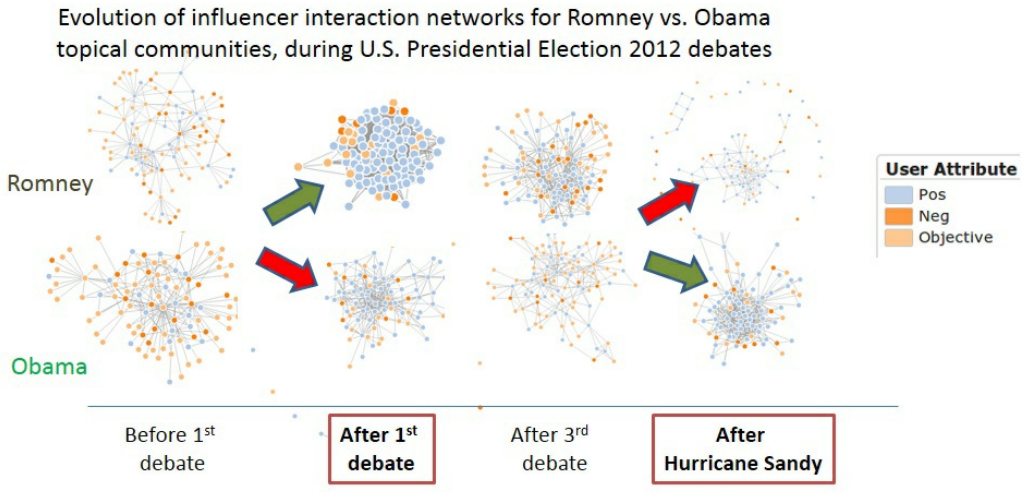




ABOVE: OWS L.A. v. OWS Chicago networks (image: http://twitris.knoesis.org/)

Another method of organizing data, which Twitris is still developing, allows users to ask simple questions. For example, Twitris wanted to gauge how OWS might be viewed in light of past movements and asked how many historical figures were mentioned during OWS protests. Rosa Parks was mentioned 639 times and Howard Zinn, an American civil rights historian, 415 times. This type of human interaction generates even greater insights, Purohit notes.

During the 2012 presidential elections, Twitris tracked the way “influencers” responded to electoral events, creating a map of positive, negative, and neutral reactions to each electoral debate or event.



ABOVE: The top 100 influential social media users and how their interactions play out over the course of the 2012 presidential election. (image: http://twitris.knoesis.org/)

Finally, the “popular perceptions across geography” tool provides a map of sentiments and opinions across regions as specific as a city or a state. “It is extremely important for something like U.S. elections to know what are the red and blue states saying,” explains Purohit.

Verifying the Data

One gaping issue in handling public data is verifying its authenticity.

Twitris addresses this issue by applying aggregation techniques in order to find trusted information. Think of it as ox-weighing at the 1906 county fair. As the anecdote goes, over 800 attendees were asked to guess the weight of an ox. While no one person guessed correctly, the average response was quite accurate - within one pound of the weight of the ox.

Images and videos also help to verify facts and figures. Patrick Meier, who is now the Director of Social Innovation at the Qatar Foundation's Computing Research Institute, is creating a tool called Verily that will determine whether images have been altered. It has not yet been incorporated into Twitris.

"But because information spreads so fast, if something is wrong with the videos or photos, people can immediately verify," says Purohit. "I have seen some tweets pointing out the original source of a photo. I have seen people use a Google image search to verify photos."

In the overwhelming world of big data, Twitris may prove a powerful tool in getting civil society to understand social media and open data in a meaningful way.

Personal Democracy Media is grateful to the Omidyar Network and the UN Foundation for their generous support of techPresident's WeGov section.