

Social Media as Sensors: Microblogs as Sensors

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Academic Papers

- Microblogging during two natural hazards events: what twitter may contribute to situational awareness
 - <http://doi.acm.org/10.1145/1753326.1753486>
- Microblogging after a major disaster in China: a case study of the 2010 Yushu earthquake
 - <http://doi.acm.org/10.1145/1958824.1958830>
- Twitter use during an emergency event: the case of the UT Austin shooting
 - <http://doi.acm.org/10.1145/2037556.2037613>

Situational Awareness

- Idealized Understanding
 - Command/Control operations
 - Groups
 - Communities
- Requires Communication
 - ICT – Information and Communication Technologies
 - Microblogging!

We use Twitter as a Sensor Array

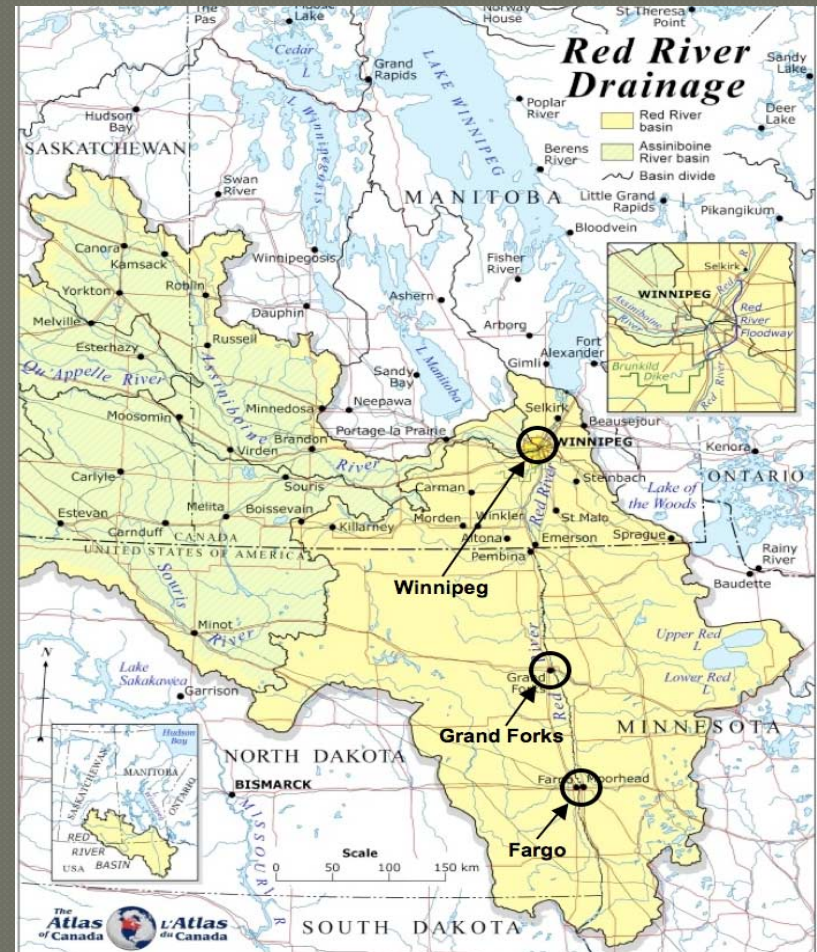
- Important news items
- Weather reports
- Emergencies
- Updates on health/well-being
- Etc.

Complex Sensors

- ◉ Keyword search
- ◉ Geolocation
- ◉ Specific Users
- ◉ Hashtagging

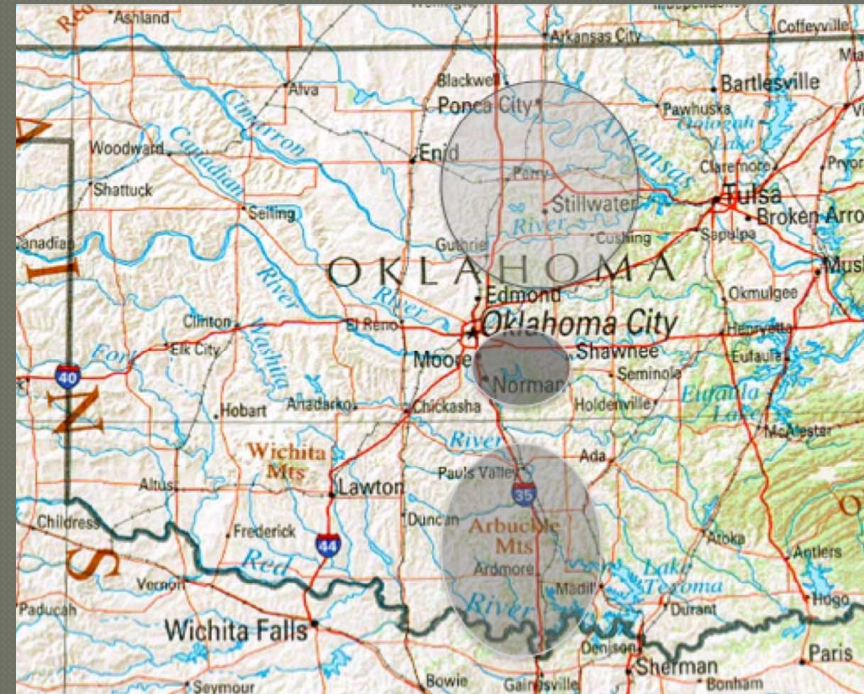
Flood

- Red River Floods
 - Spring 2009
- Lots of advance warning
- 49 Twitter authors, 19k tweets
 - Twitter API, keywords
 - E-Data Viewer, coded tags



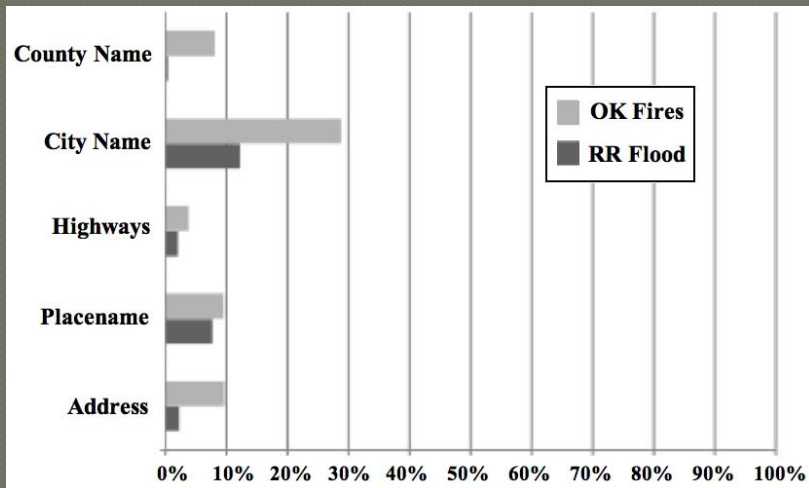
Wildfire

- Oklahoma Grassfires
 - Spring 2009
- Little if any warning
- 46 Twitter authors, 2.8k tweets



Information from Tweets

GEO-LOCATION INFO



SITUATIONAL UPDATES

Coding Category	OK	RR
<i>Warning</i>	5%	5%
<i>Preparatory Activity*</i>	N/A	7%
<i>Fire Line/Hazard Location*</i>	21%	1%
<i>Flood Level*</i>	N/A	17%
<i>Weather*</i>	6%	11%
<i>Wind*</i>	10%	1%
<i>Visibility*</i>	1%	0.2%
<i>Road Conditions</i>	2%	3%
<i>Advice (emergency)</i>	1%	2%
<i>Advice (information space)*</i>	0.3%	2%
<i>Evacuation Information*</i>	12%	4%
<i>Volunteer Information*</i>	2%	6%
<i>Animal Management</i>	1%	0.2%
<i>Damage/Injury reports*</i>	15%	2%

Situational Features

- High- and low-level situational features
 - Could be used to better develop a system that would be useful in emergencies

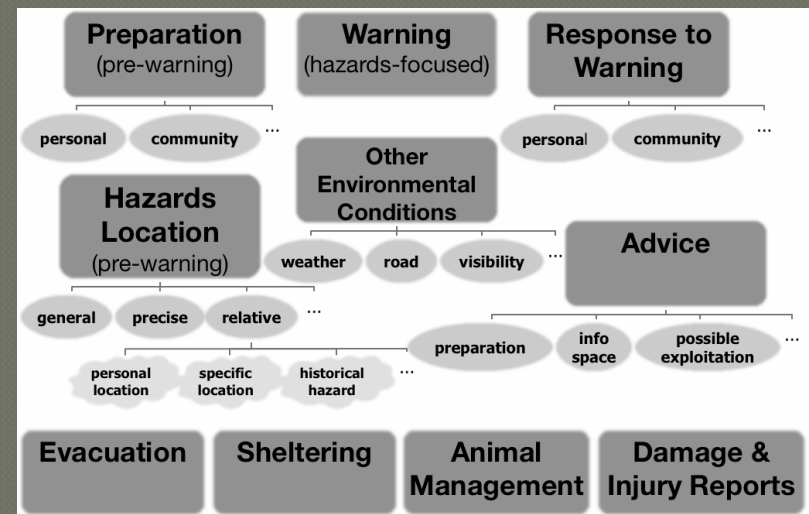


Figure 9. Microblog-Enhanced Situational Features for Emergency

Earthquake

- Yushu Earthquake
 - April 2010
- No advance warning
- 94k Sina-Weibo posts and nearly 42k re-posts
 - Search interface, keywords



Categories of Posts over Time

- Peaks occur
 - The day of the earthquake
 - National day of mourning
- Use of microblogging for:
 - Situational updates
 - Emotional support
 - Opinions
 - Calls for action

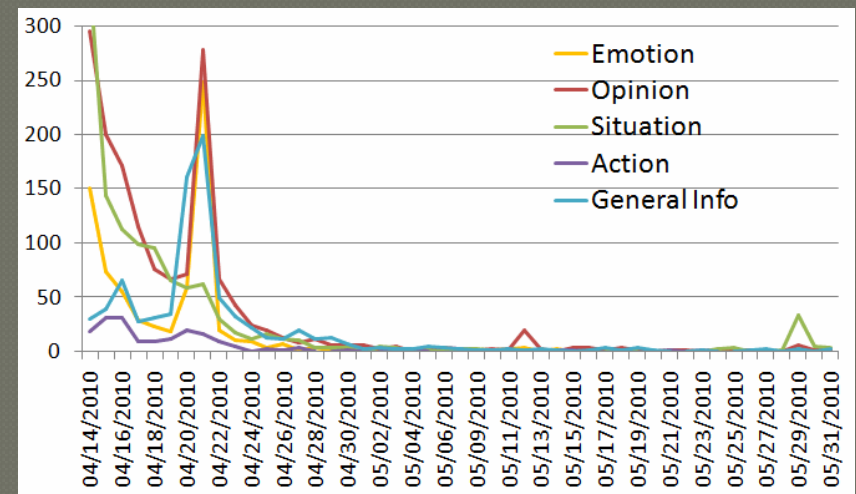


Figure 4. Category Trends (5% Sample)

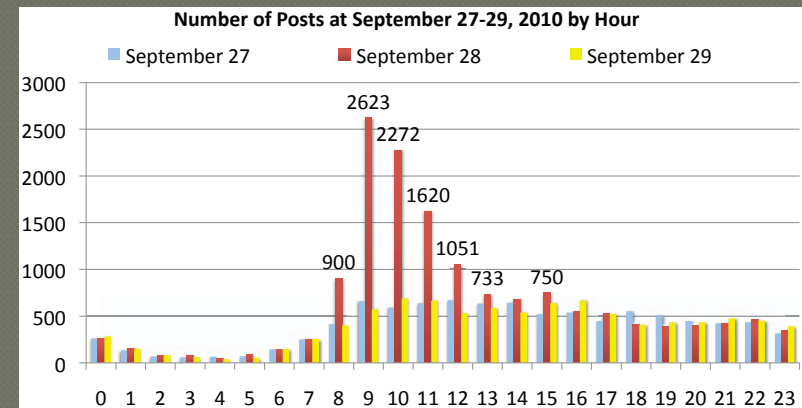
Shooting

- University of Texas at Austin
 - September 2010
- 2.8k Twitter authors
 - Peak of 15k tweets/day
 - Followers of @UTAustin with public accounts



Something is going on

- Day before, day of, day after
- Event happened around 8AM, Sept. 28



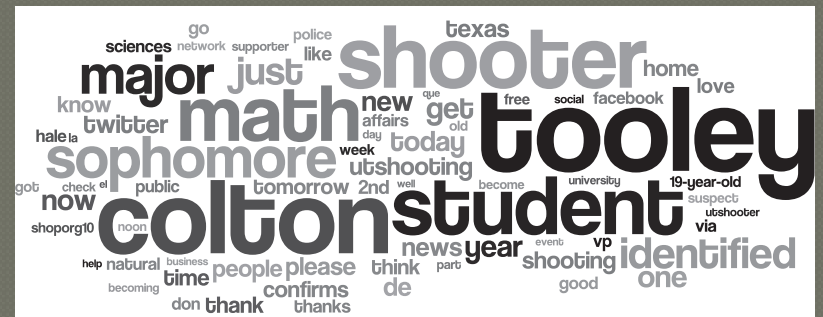
Word cloud for the entire day



Word clouds over time

8AM

2PM



Challenges/Opportunities

- ◉ Determining importance of individual microblog posts
- ◉ Determining category of posts
 - And therefore relevance?
- ◉ Gathering accurate and timely news from tens to thousands (millions?) of users
- ◉ Presenting information in a useful manner
 - Audience-based?

Questions?

References

- Sarah Vieweg, Amanda L. Hughes, Kate Starbird, and Leysia Palen. 2010. Microblogging during two natural hazards events: what twitter may contribute to situational awareness. In Proceedings of the 28th international conference on Human factors in computing systems (CHI '10). ACM, New York, NY, USA, 1079-1088. DOI=10.1145/1753326.1753486 <http://doi.acm.org/10.1145/1753326.1753486>
- Yan Qu, Chen Huang, Pengyi Zhang, and Jun Zhang. 2011. Microblogging after a major disaster in China: a case study of the 2010 Yushu earthquake. In Proceedings of the ACM 2011 conference on Computer supported cooperative work (CSCW '11). ACM, New York, NY, USA, 25-34. DOI=10.1145/1958824.1958830 <http://doi.acm.org/10.1145/1958824.1958830>
- Lin Tzy Li, Seungwon Yang, Andrea Kavanaugh, Edward A. Fox, Steven D. Sheetz, Donald Shoemaker, Travis Whalen, and Venkat Srinivasan. 2011. Twitter use during an emergency event: the case of the UT Austin shooting. In Proceedings of the 12th Annual International Digital Government Research Conference: Digital Government Innovation in Challenging Times (dg.o '11). ACM, New York, NY, USA, 335-336. DOI=10.1145/2037556.2037613 <http://doi.acm.org/10.1145/2037556.2037613>