

Characterizing events and human behavior based on AI-aided analysis of data collected from web and social media sources

For Workshop:

**Human-Centered AI for Research, Innovation, and Creativity: Creating
Connections Across Disciplines**

25 March 2022, Hybrid, Virginia Tech

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<http://fox.cs.vt.edu/talks/2022/20220325CHCI6panelSheetzFox.pptx>

Some areas of collaboration: disciplines / industries

Agriculture	Entrepreneurship	Linguistics
Archaeology	Fisheries	Medicine
Archival science	Geography	Networks, WWW
Biodiversity	Gerontology	Network science
Biometrics	Health	Neuroscience
Biology	History	Publishing
Chemistry	Information science	Physics
Civil engineering	Insurance	Psychology
Education: computing, graduate	Law / legal	Sociology
Electrical engineering	Library science	Wildlife

Grants

- Living In the KnowlEdge Society (LIKES), NSF CCF-0722259, 2007-2010
- CTRnet (Crisis, Tragedy & Recovery Net), NSF IIS-0916733, 2009-2013
- Social Media for Cities, Counties, and Communities, CCSR (partnership between Arlington Co., IBM Research, VT), 2010
- Integrated Digital Event Archiving and Library (IDEAL): NSF IIS–1319578, 2013-6

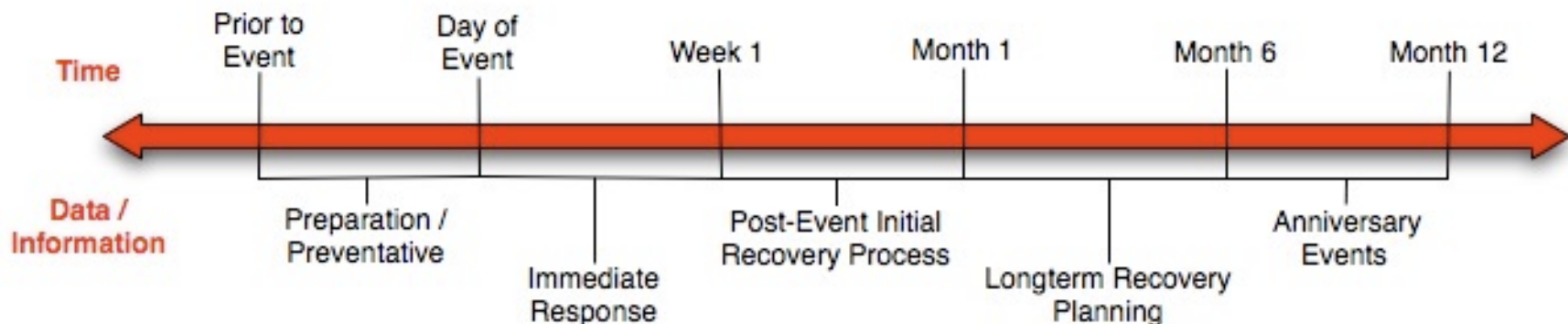
- Thanks also to: Andrea Kavanaugh, Donald Shoemaker, ...

Selected Papers

1. Steven D. Sheetz, Andrea Kavanaugh, Hamida Skandrani, Edward A. Fox. Uses and Gratifications of Political Information: Student Perceptions of Information from the 2014 Tunisian Elections. In Proc. Deep Transformations and the Future of Organisations, 4th International Conference of the Interdisciplinary Laboratory of University-Business Management, University of Manouba, Tunis, Tunisia, 6-7 December 2019
2. Steven Sheetz, Andrea Kavanaugh, Edward Fox, Riham Hassan, Seungwon Yang, Mohamed Magdy, and Donald Shoemaker. (2019). Information Uses and Gratifications Related to Crisis: Student Perceptions since the Egyptian Uprising. Proceedings of the 16th International Conference on Information Systems for Crisis Response And Management, ISCRAM 2019, pp. 674-690. Valencia, Spain, 19-22 May 2019
3. Andrea Kavanaugh, Steven D. Sheetz, Hamida Skandrani, and Edward A. Fox. Media use by young Tunisians during the 2011 revolution vs 2014 elections. *Information Polity* 22(2-3): 137-158 (Oct. 20, 2017), DOI 10.3233/IP-170412
4. Andrea Kavanaugh, Steven D. Sheetz, Hamida Skandrani, John C. Tedesco, Yue Sun, and Edward A. Fox. The Use and Impact of Social Media during the 2011 Tunisian Revolution, Proc. 17th International Digital Government Research Conference (dg.o 2016), Fudan University, China, June 8-10, 2016, 20-30
5. Andrea L. Kavanaugh, Steven D. Sheetz, Rodrigo Sandoval-Almazan, John C. Tedesco, Edward A. Fox. Media use during conflicts: Information seeking and political efficacy during the 2012 Mexican elections. *Government Information Quarterly*, 33(3): 595-602, Feb. 2016, DOI: 10.1016/j.giq.2016.01.004
6. Andrea Kavanaugh, Steven Sheetz, John Tedesco, Sandoval-Almazan Rodrigo, and Edward Fox. Media Use during Conflicts: Gratifications & Efficacy during 2012 Mexican Elections. 15th Annual International Conference on Digital Government Research (dg.o 2014), Aguascalientes City, Mexico, June 18-21, 2014
7. Andrea Kavanaugh, Steven D. Sheetz, Riham Hassan, Seungwon Yang, Hicham G. Elmongui, Edward A. Fox, Mohamed Magdy, and Donald J. Shoemaker. Between a Rock and a Cell Phone: Communication and Information Technology Use during the 2011 Uprisings in Tunisia and Egypt. *Int'l J. of Information Systems for Crisis Response and Management (IJISCRAM)*, 5(1): 1-21, January - March 2013
8. Seungwon Yang, Haeyong Chung, Xiao Lin, Sunshin Lee, Liangzhe Chen, Andrew Wood, Andrea L. Kavanaugh, Steven D. Sheetz, Donald J. Shoemaker, and Edward A. Fox. (2013). PhaseVis1: What, when, where, and who in visualizing the four phases of emergency management through the lens of social media. 10th International Conference on Information Systems for Crisis Response and Management, ISCRAM 2013 (pp. 912-917). KIT; Baden-Baden, Germany
9. Andrea L. Kavanaugh, Edward A. Fox, Steven D. Sheetz, Seungwon Yang, Lin Tzy Li, T. Whalen, Donald J. Shoemaker, Apostol Natsev, Lexing Xie. Social Media Use by Government: From the Routine to the Critical. *Government Information Quarterly (GIQ)* 29(4): 480-491, Oct. 2012
10. Andrea L. Kavanaugh, Steven D. Sheetz, Riham Hassan, Seungwon Yang, Hicham G. Elmongui, Edward A. Fox, Mohamed Magdy, and Donald Shoemaker. (2012). Between a rock and a cell phone: Communication and information technology use during the 2011 Egyptian uprising. 9th International Conference on Information Systems for Crisis Response and Management, ISCRAM 2012. Vancouver, BC, Apr. 22-25: Simon Fraser University.
11. Kavanaugh, A., Fox, E., Sheetz, S., Yang, S., Li, L.T., Whalen, T., Shoemaker, D., Natsev, A., Xie, L. Social Media Use by Government: From the routine to the critical. *ACM 2011 Digital Government Research Conference (dg.o 2011)*, June 12-15, 2011 (College Park, MD), 121-130.
12. Andrea Kavanaugh, Seungwon Yang, Steven D. Sheetz, and Edward A. Fox. Microblogging in crisis situations: Mass protests in Iran, Tunisia, Egypt. Workshop on Transnational HCI at CHI 2011, May 7-12, Vancouver, 6 pages
13. Wingyan Chung, Seungwon Yang, Edward A. Fox, and Steven D. Sheetz. Integrating Computational Thinking Into Information Systems and Other Curricula. Proceedings AIS SIG-ED IAIM 2010 Conference, St. Louis, Missouri, Dec. 10-12, 8 pages
14. Uma Murthy, Edward Fox, Naren Ramakrishnan, Andrea Kavanaugh, Steven Sheetz, Donald Shoemaker, and Venkataraghavan Srinivasan. Building an Ontology for Crisis, Tragedy, and Recovery. NKOS Workshop, ECDL 2009, 1 Oct. 2009, Corfu, Greece
15. Edward A. Fox, Christopher Andrews, Weiguo Fan, Jian Jiao, Ananya Kassahun, Szu-Chia Lu, Yifei Ma, Chris North, Naren Ramakrishnan, Angela Scarpa, Bruce H. Friedman, Steven D. Sheetz, Donald Shoemaker, Venkat Srinivasan, Seungwon Yang, & Laura Boutwell, A Digital Library for Recovery, Research, and Learning from April 16, 2007 at Virginia Tech. *Traumatology*, 14(1): 64-84 (2008), DOI: 10.1177/1534765608315632

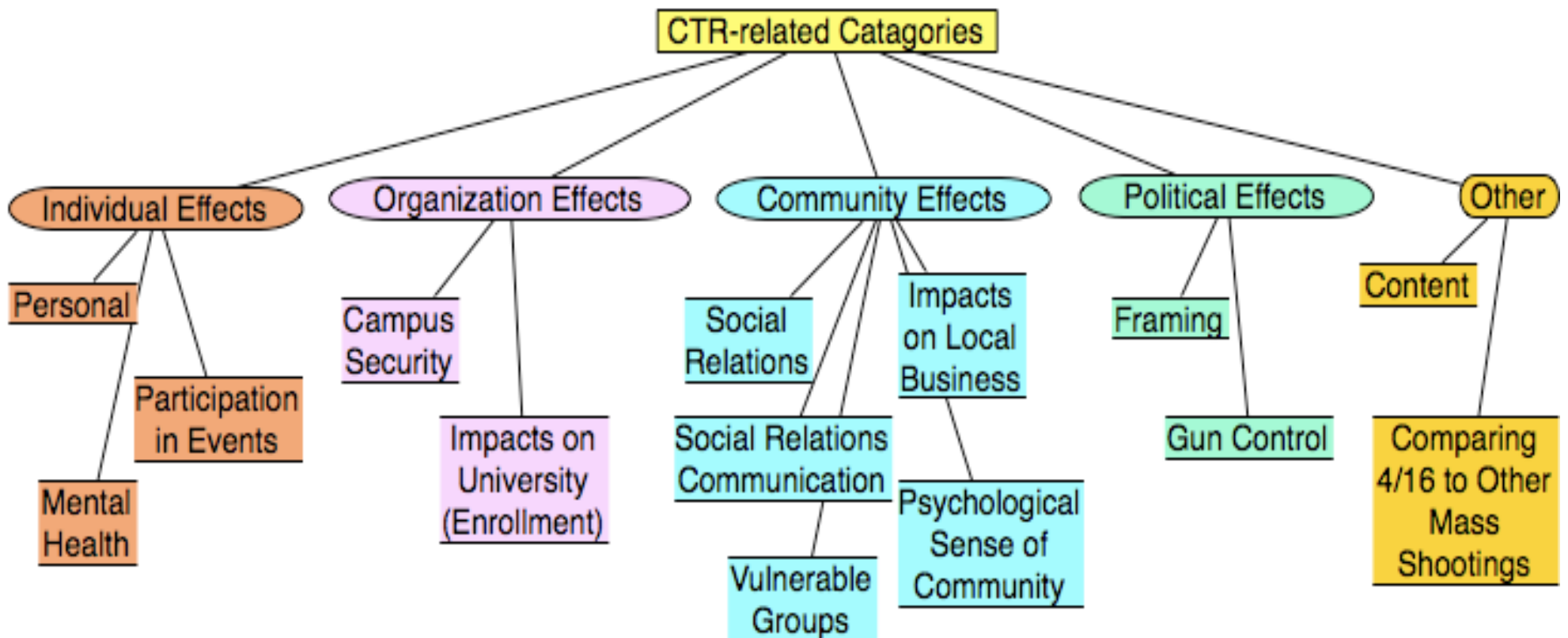
Crisis, Tragedy, and Recovery

- ~10 TB, ~100 tweet + ~50 webpage collections
- Human tragedies that result from man-made and natural events affect humans and communities significantly.
- During and after a tragic event, there are a series of needs that have to be addressed.
 - Compounded by communication failures and a confusing plethora of data and information

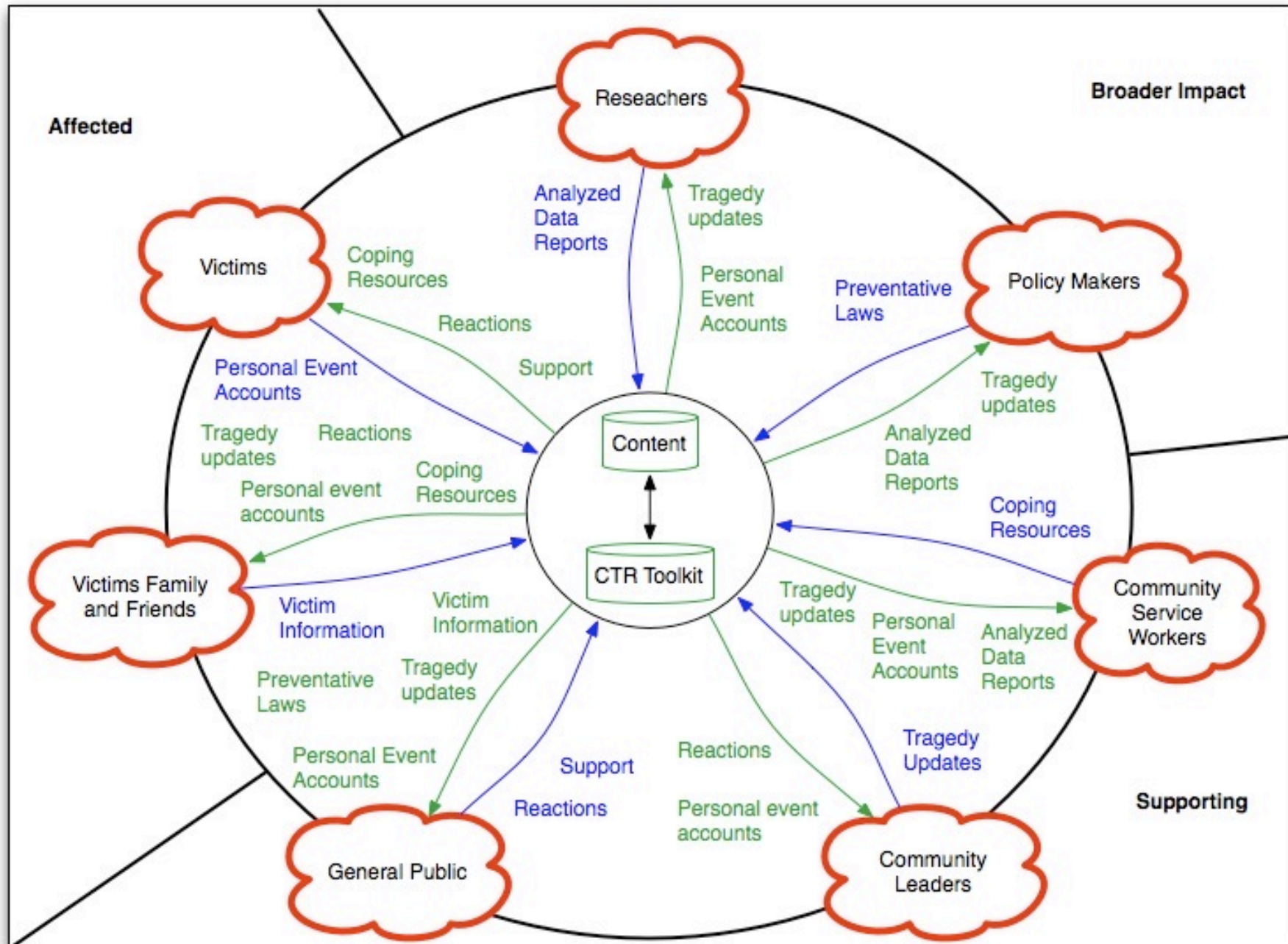


Categories from focus group study

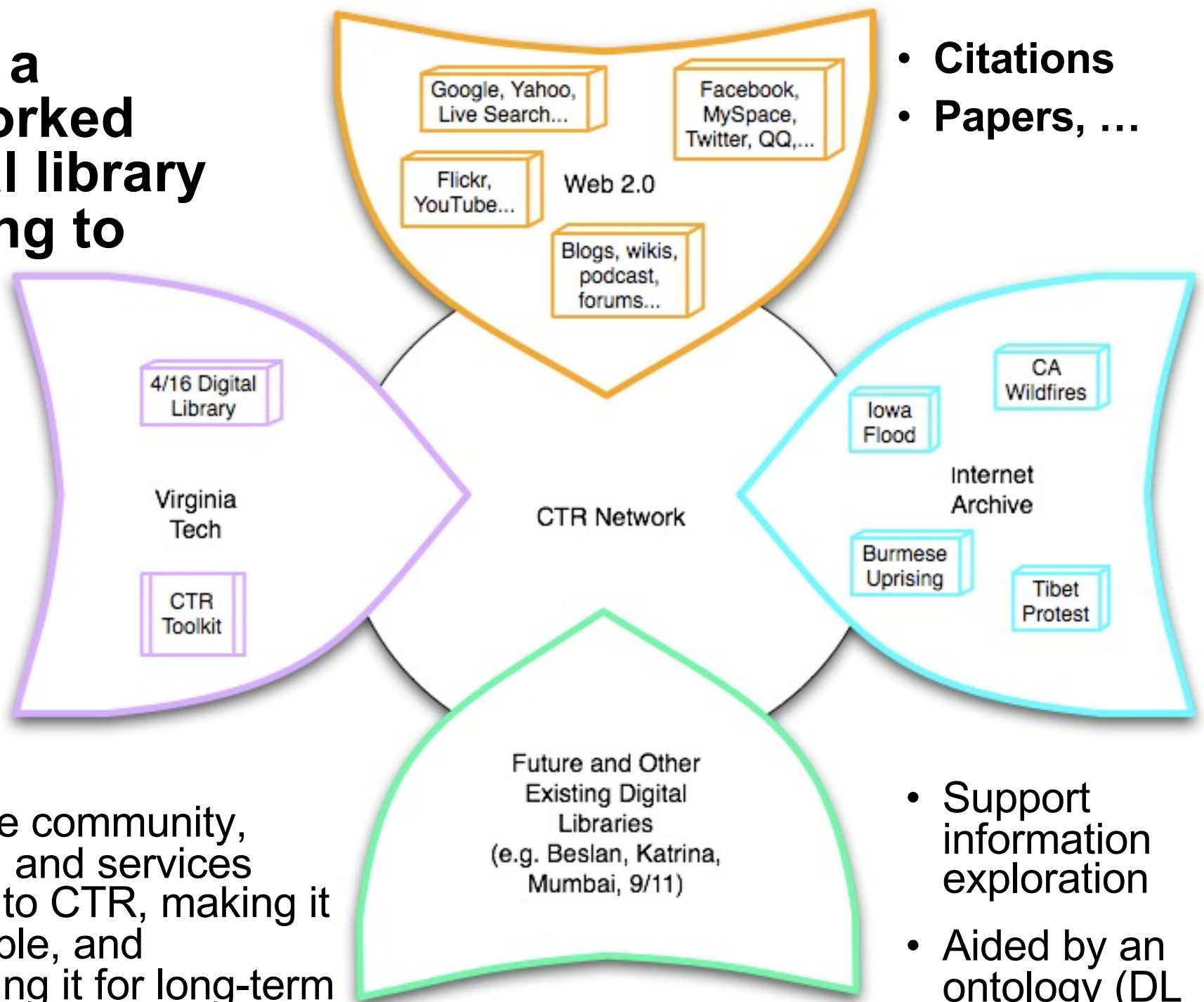
Results from focus group interviews following the April 16, 2007 tragedy at Virginia Tech



CTR stakeholders



- **Build a networked digital library relating to CTR**



- Citations
- Papers, ...

- Integrate community, content, and services relating to CTR, making it accessible, and preserving it for long-term reuse

- Support information exploration
- Aided by an ontology (DL Book 3 Ch. 3)

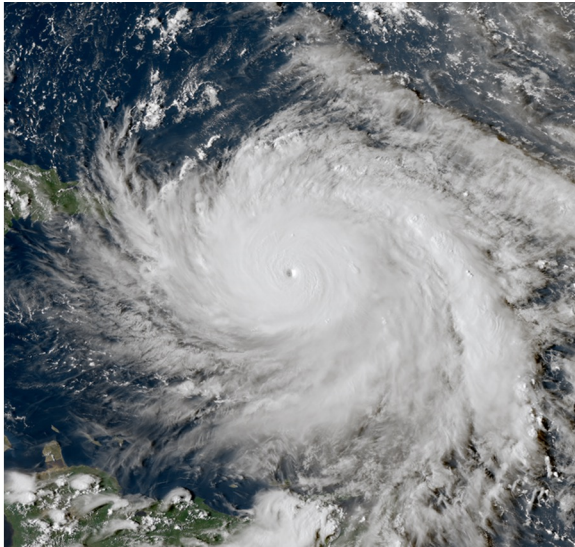
www.ctrnet.net

University Libraries Tweets

- 6+ billion tweets covering important events
- Going to University Libraries by May 2022
- JSON files of tweets for each event-related collection
- JSON file for collection level metadata
- Services to help with searching, etc.
- CS4624 Twitter Archives team (Griffin Knock, Nicole Fitz, Ryan Nicholas, Matthew Gonley, and Derek Bruce); extending prior project:
<http://hdl.handle.net/10919/107086>

Topics Include

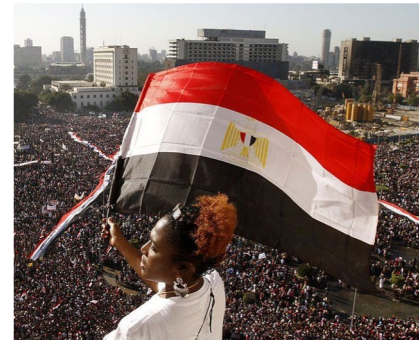
Natural Disasters



Diseases



Political Events



More!



Coll#	Event Name	Number of Tweets
602	Myocardial infarction	20812918.0
603	Hassan Rouhani	21562860.0
604	Tropical cyclone	22262127.0
605	Bahrain	23012550.0
606	2012HurricaneSandy	23179590.0
607	Tornado	23883414.0
608	2016HurricaneMatthew	24001324.0
609	Bomb	24296714.0
610	Negar Mottahedeh	26241037.0
611	Sinkhole	26739475.0
612	Israel	26945844.0

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613	Blacksburg, Virginia	28559370.0
614	Earthquake	30810654.0
615	Obesity	31477896.0
616	Diabetes mellitus	33365886.0
617	Syria	34464914.0
618	Pothole	35336155.0
619	Flood	37632138.0
620	Tsunami	43950091.0
621	Foursquare	44569577.0

Questions?
Discussion?

Thank You!

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