CTRnet:

Integrated Digital Library Support for Crisis, Tragedy, and Recovery

NSF IIS-0916733 Project Summary

There are many collective human tragedies that result from either natural or manmade events, where communities are adversely affected. Communities have responded to such events in various ways, with thousands of examples of vigils, memorials, and archives demonstrating the desire to preserve the communal memory of a tragic event. Today people make virtuous use of social networking and other internet software to respond to tragedy, in creative and dynamic ways. For example, the Facebook group of 4/07, "I'm OK at Virginia Tech," rapidly assured students that their friends were OK. The same desire to remember that caused previous generations to write letters or poems and treasure them, leads current generations to create and upload digital photos and videos. Such spontaneous ad hoc responses to grief, stress, and confusion demonstrate how desperately people need to communicate, record, and understand.

Yet, advanced intelligent information integration methods have not been applied to this domain, which we refer to as Crisis, Tragedy and Recovery (CTR). The impact of these events is felt over extended periods, requiring longitudinal perspectives to understand their complexity and inter-dependencies. Consequently, with the Internet Archive and other partners, we will begin to build CTRnet, an integrated distributed digital library network for providing a rich suite of CTR-related services. This digital library will include collecting and archiving, before it can be lost, as much information as possible – through uploading, crawling, harvesting, and connecting with Web 2.0. Such work must continue as communities work to recover and heal, and as documents become available that were involved in litigation, or result from studies, reforms, and reports – some only made available long after a tragic event.

Since shortly after the April 16, 2007 shootings at Virginia Tech, we have integrated digital library, data and text mining, information visualization, and social network analysis techniques to help with recovery after our nation's most tragic school crisis. We will leverage our experience to develop a next-generation domain specific digital library software suite, the CTR-toolkit, building upon 17 years of work on digital libraries, as well as expertise in information retrieval, data and text mining, database management, human-computer interaction, and sociology.

Intellectual merit: We will extend the 5S framework (i.e., societies, scenarios, spaces, structures, and streams) to incorporate a rich set of specific services customized to the CTR domain, coupled with built-in logging and evaluation tools. We will bundle these into a toolkit which, when rapidly distributed, will integrate new communities experiencing a tragedy into a widely distributed networked digital library. Advanced services will better support a diverse set of stakeholders and leverage what has been learned from past events to facilitate the healing process. Embedded assessments provide measures across events to understand the most effective strategies for capturing and making CTR information available, as will be shown through coordinated evaluation and reporting. We will provide integrated exploration services by connecting ontologies, tagging, browsing, querying, query splitting, data and text mining, and our own advanced methods: Stepping Stones and Pathways, PathRank, and Storytelling. By incorporating tools for surveys, statistical analysis, and information visualization, we will make it possible for those studying, or otherwise dealing with, crises to address short- and long-term individual and community needs.

Broader impact: As globalization, instantaneous telecommunications, terrorism, global warming, over-population, and other trends bring more people closer to tragic events, the need for effective individual and community support increases. The public expects immediate and ongoing information provision, and needs integrated information access to understand the best ways to deal with and recover from these events. People who are directly or indirectly affected by tragedies, those providing support services, and those in the social and behavioral sciences, could benefit enormously from CTRnet. Communities facing a tragedy would save time and trouble during a difficult period by using the CTR-toolkit to instantly enable their digital library, thus leveraging knowledge of the CTRnet community. Long-term research that considers multiple events will be enabled by CTRnet. Even more broadly, this approach to intelligent integration aided by digital libraries could be applied to other domains and communities, changing the face of social and behavioral science research, as well as other areas.

Crisis, Tragedy and Recovery Network (CTRnet)

Keywords

Crisis Informatics, Data Fusion, Digital Libraries, Intelligent Data Analysis, Recovery

Objectives

- Build a digital library, and archive/preserve information (in various formats like HTML, images, videos, etc.) relating to all kinds of community crises and tragedies
- Integrate (including with data analysis and visualization) community (plus other stake-holders), content, and services relating to CTR
- Provide web-based services to communities around the world to deal effectively with various kinds of tragedies, supporting long-term recovery as well as scholarly research and public or professional reference
- Focus 1st on school shootings

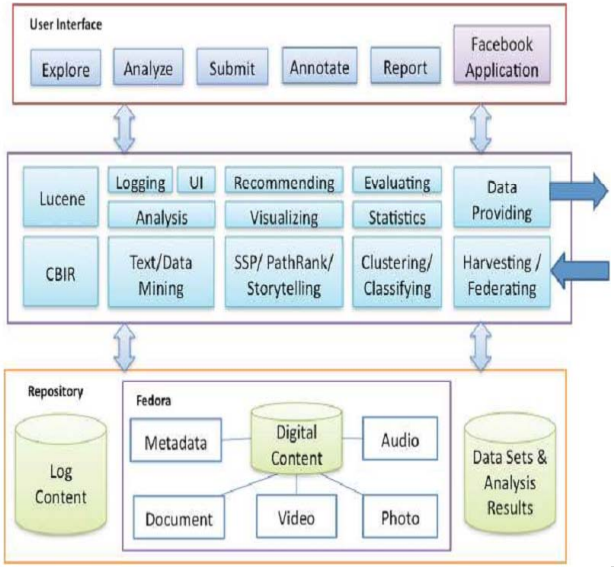
School shootings around the world (1996-)

(Picture courtesy: http://www.mibazaar.com/schoolshootings/)

Internationalization

- Internet Archive will preserve forever electronic content from anywhere in the world, and supports English, Spanish and Portuguese language content.
- Monterrey Tech partner enhances the ability to search and evaluate content in Spanish media worldwide.
- Potential partners have been contacted in Finland and Russia.
- We welcome assistance in connecting a global set of partners, including universities and interested organizations.

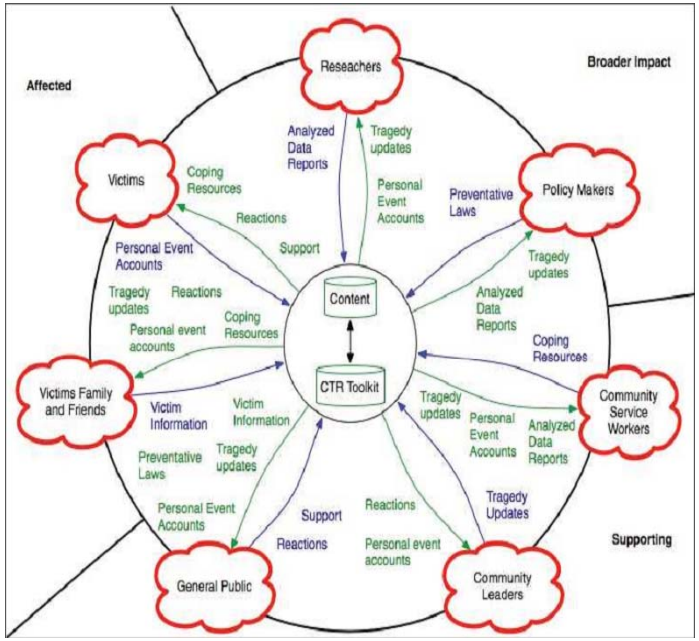
CTRnet Data Analysis Techniques



Impact

- Help affected communities to recover more quickly and effectively through access to a global network with relevant information and resources
- Support the research community, emergency personnel, decision makers, and the public in reacting to and recovering from crises.

CTRnet utility for various stakeholders



Partners

Virginia Tech — Virginia Polytechnic Institute and State University

Internet Archive

Tecnológico de Monterrey

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