

Global Terrorism Data Visualization

Caroline Ziemkiewicz, Xiaoyu Wang, Alex Godwin, Wenwen Dou, Remco Chang,
Robert Kosara, and William Ribarsky
University of North Carolina at Charlotte, SRVAC

We present a system for the visual analysis of terrorist activity based on the Global Terrorism Database (GTD) developed by the National Consortium for the Study of Terrorism and Responses to Terrorism (START).

Project Scope: To assist in accessing and understanding the information in the GTD, we have developed a set of interconnected tools to provide meaningful views on the data and support the investigative process. Our system consists of coordinated views that provide complementary perspectives on the data: an investigative view, which shows terrorist activity in a geo-temporal fashion and a dimensional view, which shows correlations and other relationships among mixed-type data dimensions. This system is highly interactive and can integrate user feedback on-the-fly to support exploratory analysis.

Recent Progress: In addition to the above, we have added an entity comparison view, which uses longest common subsequence (LCS) analysis to compare patterns of activity between groups. Prototypes of all three views have been developed and are being integrated into a complete visual analytics system that shares information in order to provide the user with different but interconnected perspectives on the data. This integration of multiple perspectives allows the user to investigate different aspects of a question while maintaining a holistic sense of the data.

Future Plans: We will make these tools available to our collaborators at START and PNNL and deploy a version of the system on the website of the GTD project. During this process of deployment, we will be performing user evaluation on the system, as well as exploring its applicability to other forms of criminal activity. Although the GTD is an invaluable source, the scope of this project is not limited to visualizing a single dataset. Our ultimate goal is to allow investigators to take a global, strategic view of patterns in terrorist activity from many different data sources.

Relevance: This work contributes to the field of data analysis and visualization by applying visual analytics to an important and challenging problem. In addition, we present a novel application of LCS to visual analysis of temporal patterns.

Publications: Portions of the project are set to appear in two publications at the *SPIE Defense and Security Symposium 2008*: "Visual Analysis of Entity Relationships in Global Terrorism Database," by Alex Godwin, Remco Chang, Robert Kosara, and William Ribarsky, and "Visualizing Uncertainty for Geographical Information in Global Terrorism Database," by Josh Jones, Remco Chang, Thomas Butkiewicz, and William Ribarsky.