GeoVISTA CrimeViz

Geovisual Analytics for Spatiotemporal Crime Analysis

GeoVISTA CrimeViz [http://www.geovista.psu.edu/CrimeViz/] is an extensible web-based map application that supports geovisual exploration of and sensemaking about criminal activity in space and time. The first prototype enabled analysis of a rich dataset of violent crimes published to the web through the District of Columbia Data Catalog [http://data.octo.dc.gov/]. We are now transitioning the tool for use by the Harrisburg, Pennsylvania, Bureau of Police.

The GeoVISTA CrimeViz application includes a central interactive map (using the Google Maps web mapping service), filtering by crime type, linear and composite animations with VCR controls, an interactive temporal legend that doubles as a frequency histogram, and a set of toggleable reference map layers. We are taking a user-centered approach to guide development of the GeoVISTA CrimeViz concept. An initial usability assessment of version one of the application revealed major interface and mapping problems. The results were used to revise the DC CrimeViz prototype significantly. Our next step in the process was to gather more information about current practices in crime mapping and analysis through interviews, surveys, and hands-on interactive sessions with law enforcement personnel. Feedback from these activities has been integrated into version two, which is being designed specifically to support needs of the Harrisburg Bureau of Police.

The revised GeoVISTA CrimeViz application features an interface that simplifies complex queries using combinations of URC codes, MOs, and keywords and also implements a robust approach to dealing with the temporal component of the data, allowing for filtering by time range, hour of the day, day of the week, and month(s) of the year. Time ranges can be explored independently or time series can be explored through animation. GeoVISTA CrimeViz also supports analysis of “composite time”; for example, by grouping multiple years’ data into an average week-by-day or year-by-month, the user can uncover patterns.

The system deals with data scaling issues through automated spatial aggregation to a regular polygon tessellation (or any user-supplied set of polygon boundaries).

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