VALET –Visual Analytics Law Enforcement Toolkit

Mission Need
Police records of daily criminal behaviors can be analyzed to provide meaningful information on community needs. As such, we have developed a prototype visual analytics toolkit to aid law enforcement agencies in their analysis of daily criminal reports. Our system uses daily crime report data from any available source (e.g., internal crime records, publicly available crime statistics provided by the SpotCrime web service (http://www.spotcrime.com/in/indianapolis)). Our current work focuses on both spatial and temporal modeling of criminal activities as well as the early detection of unusual criminal occurrences. In the temporal domain, we have implemented a time series cumulative summation model to detect unusual occurrences within the data. In the spatial domain, we have implemented a kernel density estimation method, allowing analysts to quickly find and identify areas with unusually large criminal activity reports. Both the temporal and spatial domains are doubly linked so that alerts occurring in one domain may be interactively selected to pull up data in the other domain. Demographic and keyword filtering tools are also available for further drill-down analysis.

Benefit: VALET technology provides law enforcement agencies with a suite of visual analytic tools for spatio-temporal exploration of police report record sets and statistics in linked statistical and spatial-temporal views. These tools provide advanced analysis capabilities, allowing analysts to develop and test hypotheses about criminal activities within various areas of their community.

Collaborators:
• NVAC
• Purdue police,
• Indiana State Police

Funded by:
• US Department of Homeland Security

Linked geo-spatial temporal and statistical analysis viewing window showing arrests (red circles) against all crimes (gray circles) overlaid on a density estimation heatmap approximating arrest distributions across Indianapolis.

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