

Passive Visual Analytics of Social Media Data for Detection of Unusual Events

Kush Rustagi, Junghoon Chae
V.A.C.C.I.N.E, Purdue University

ABSTRACT

Now that social media sites have gained substantial traction, huge amounts of un-analyzed valuable data are being generated. Posts containing images and text have spatiotemporal data attached as well, having immense value for increasing situational awareness of local events, providing insights for investigations and understanding the extent of incidents, their severity, and consequences, as well as their time-evolving nature. However, the large volume of unstructured social media data hinders exploration and examination. To analyze such social media data, the S.M.A.R.T system provides the analyst with an interactive visual spatiotemporal analysis and spatial decision support environment that assists in evacuation planning and disaster management. S.M.A.R.T fetches data from various social media sources and arranges them in a perceivable manner, which is visually appealing. This in turn is a huge aid in finding and understanding abnormal events. Introducing a passive mode makes the tool more efficient, where it automatically detects idle time and gives a summary of all the anomalies encountered in the inactive period as soon as the analyst resumes monitoring. Using the tool, the analyst can first extract major topics from a set of selected messages and rank them probabilistically. The case studies in the past show improved situational awareness by using the methods mentioned before.

KEYWORDS

Social Media, Threat Detection, Visual Analytics, Spatio-temporal Data Analysis, Probability