Interactive Visual Decision Analytics

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The topic of this minitrack, Interactive Visual Data Analytics (IVDA), has applications in a broad range of situations where human expertise must be brought to bear on problems characterized by massive datasets and data that are uncertain in fact, relevance, location in space and position in time. Examples include environmental science and technologies, natural resources and energy, health and related life sciences, precision medicine, safety and security (aircraft safety, law enforcement, antiterrorism, disaster relief) and business processes. This year we are highlighting a broad range of analytic tasks such as emergency management and response, natural disaster response, pandemics, market analysis, and other domains where interactive visualization systems may be used to improve human decision-making. Key research challenges of interest in this area include studies of visual analytics and decision support, interactive performance related to serving up information with a short time of relevance, and collaborative analysis using visual information systems.

The focus in this minitrack goes beyond analytics to include rich, powerful visualization techniques for turning data into actionable information. These rich, interactive visual analytic environments offer even greater power and promise to solve big data problems for data that is "big" in any of the dimensions of variability, velocity, or volume. This minitrack builds upon earlier HICSS minitracks on visual analytics, mobile computing, and digital media at scale, focusing more decision analytics in various applications from business to science, natural disasters, public safety, and policy.

One paper selected for this minitrack, "HotSketch: Drawing Police Patrol Routes among Spatiotemporal Crime Hotspots," presents research to couple spatiotemporal analysis of historical crime data with sketch-based interaction methods. This work allows police officers to more rapidly use predictive models for crime in their neighborhood while away from the precinct.

A second paper, "Space-Time Kernel Density Estimation for Real-Time Interactive Visual Analytics," details a GPU-baed implementation of the Space-Time Kernel Density Estimation to significantly speed up the analysis of spatio-temporal data. The methods are integrated into a web-based interface and validated using hurricane data, pandemics data and market data through collaboration with a local company.

These papers show a wide range of visualization and analytics in complex decision making environments and provide valuable insights into the design, production, and deployment of visual analytics applicable to most decision and discovery tasks across a broad spectrum of applications. Moreover, they clearly demonstrate effective ways to harness and tame big data for discovery, insight, management, and action.

Looking back over the evolution of visual analytics for decision making, as shown in past mini-tracks, it is clear that the uses of visual decision analytics has grown and spread to more fields and we see this trend continuing at an accelerated rate. As more data becomes available in every aspect of decision making, the role and importance of interactive visual decision analytics will become critical in effective and efficient decision making.We hope you will join us for interesting presentations and lively discussions on new visual analytics techniques and solutions for our evolving landscape of problems requiring rapid and reliable decision-making.

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