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 natural disaster response, IT and network security, decision support frameworks, event management and preparation, 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 in the context of an organization (e.g., IT and crowd control), how to successfully address and tailor analytic systems to solve real-world problems and integrate efficiently into workflows, perceptual and cognitive aspects of the analytic task, novel interaction and visual representations, 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, "Parallel Spaces: Simultaneous Exploration of Feature and Data for Hypothesis Generation," presents a new visualization technique called ParallelSpaces. This technique is designed to analyze business transaction data and generate initial hypotheses for business intelligence. The authors also demonstrate the effectiveness of this technique analyzing crowd-sourced data.

A second paper, "Mixed-Initiative for Big Data: The Intersection of Human + Visual Analytics + Prediction," introduces mixed-initiative research and expands the concept into other key areas where the system interacts intelligently with the user, negotiating who leads analytical discovery – sometimes the human, sometimes the computer. This interaction is done through predictive machine learning where the system learns to anticipate what the user wants and proactively accomplishes this task for the user.

A third paper, "The Personal Equation of Interaction for Categorization of Composite Glyphs," presents techniques to be used as a design and evaluative measure of the visualizations themselves. The personal equation of interaction can inform the "how to" of design by predicting how well analysts will employ the use of visual artifacts, for example glyphs or visual analytics diagrams.

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. 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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