

**Visual Analytics for Command and Control:  
Creating Actionable, Relevant Information from  
Multisource, Evolving Data**

David S. Ebert  
Purdue University

Abstract

Increasing the effectiveness of command and control operations in real-world environments requires a new generation of technology that can support planning, detection, management, response, and recovery.

These tools must provide comprehensive analytic capabilities that enable the entire process from receiving massive amounts of real-time raw data, to the integration and extraction of relevant data, to the integrated visual presentation and analysis environment. Effective visual analytic tools must transform this data into actionable information that is easily understood by a variety of personnel using a variety of platforms, ranging from an emergency operation center's large displays to the cell phones of first responders. We are developing these techniques that also increase the effectiveness and timeliness of decision-making and response, thereby increasing the effectiveness of the entire response team. Effective visual analytic solutions must address the rate of information update; usability and interaction mechanisms; the user, task, and environment; and security and privacy.

Integrating all these components into a comprehensive visual analytic environment is a challenging, but necessary, effort to enable time-critical decision-making and response that will lead to saving lives and property.