



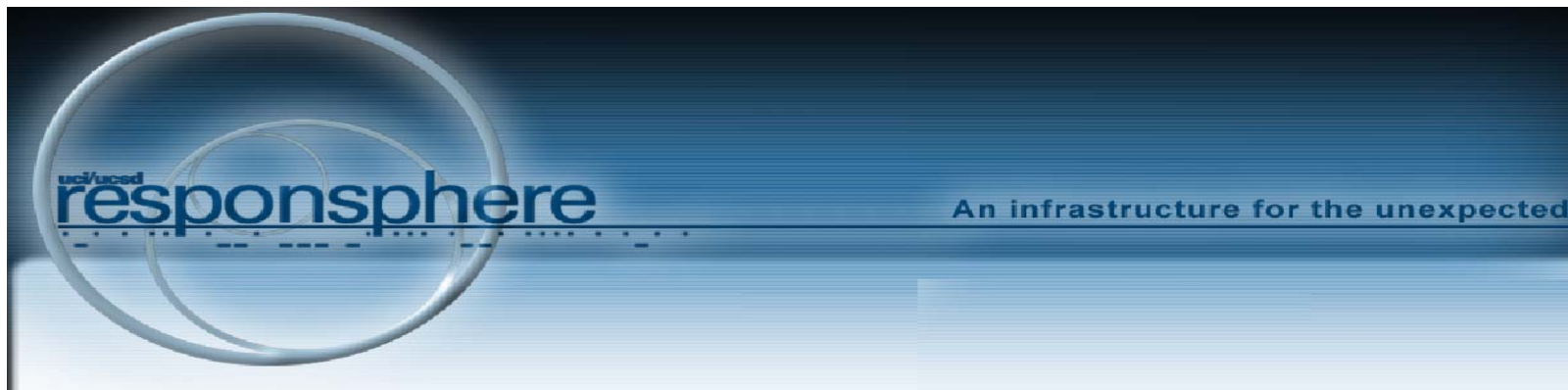
Center for Emergency Response Technologies

The Center for Emergency Response Technologies (www.cert.ics.uci.edu)

During a crisis event, bringing the right information, at the right time, to the right person, can significantly impact the quality of decision making for First Responders as well as the general public. Effective decision making during a crisis can be directly attributed to saving lives and property. The research team assembled by the Center for Emergency Response Technologies (CERT) believes that information technologies can enhance decision making abilities.

The goal of the center is new and innovative technology research. The focus will be on how technology will improve emergency response. At the system level: robust systems, resiliency in extreme situations. At the Information level: convert large-scale, multi-modal information into actionable information upon which decisions can be made. A layer of social science research provides the application context. Engineering research (e.g., transportation systems and alert systems) provide a specific lifeline for which the value of IT can be illustrated.

CERT's major research areas consist of the RESCUE project (www.itr-rescue.org), the SAFire project, and the Responsphere Infrastructure. CERT has created significant breakthroughs in emergency response science as well as transitioned a number of technologies to first responders.



The Responsphere Project (www.responsphere.org)

Leveraging the existing infrastructure work from the RESCUE project, The CERT Researchers at UCSD and UCI are enhancing the Responsphere testbed to significantly improve the testbed 's ability to support a variety of research requirements including its original function as a crisis response IT infrastructure system. Responsphere is a test-bed that incorporates a multidisciplinary approach to emergency response, drawing from academia, government, and private enterprise. The purpose of this infrastructure is to establish a campus-level experimental Information Technology infrastructure to serve as a platform for development, testing, and validation of current research efforts on responding to a crisis, and will facilitate rapid and seamless access to and dissemination of information. The SATWare middleware interface provides researchers with a powerful yet easy to use interface into the Responsphere testbed.

The testbed also serves as the community liaison program for the RESCUE project. Responsphere has instrumented a number of 1st Responder test facilities, cities, and campus locations as part of its technology outreach. Conducting several drills, evacuations, and other emergency response activities, the testbed serves a vital function for technology development, testing, and transfer.

Overview of CERT Research Thrust Areas

(detailed summaries can be found on our website at <http://cert.ics.uci.edu>)

SAFIRE (SITUATIONAL AWARENESS FOR FIREFIGHTERS)

Emergency responders in all roles must process information, make critical decisions, take appropriate actions, and communicate effectively with others around them in order to preserve the safety of firefighters. These activities must be accomplished under dynamic and dangerous conditions where time is of the essence, and rarely with complete situational awareness. When a high level of situational awareness is achieved, more informed decisions can be made, resulting in much more effective actions and better management of risks. The quality of situational awareness that exists throughout all levels of the emergency response hierarchy has a direct impact on the safety of individual firefighters.

Achieving situational awareness requires acquisition of knowledge of past events, an in-context understanding of present circumstances, and anticipation of future events. It also requires a high degree of communication and coordination up-and-down the chain of command, as well as between peers, whether the peers are individual firefighters, incident commanders, or cities within an operational area.

The key deliverable is a Fire Incident Command Board (FICB) through which the user can establish and maintain situational awareness utilizing a wide range of sensor and data streams from the field as well as existing centralized information systems such as CAD and GIS. The FICB prototype that will be delivered as a result of the project will be specifically targeted towards the needs of an incident commander. We anticipate that future efforts could expand upon the FICB prototype created during this project in order to provide FICB variants specific to needs of other users, e.g. planning and intelligence analysts in EOCs.

RESCUE (RESPONDING TO CRISIS AND UNEXPECTED EVENTS)

The goal of the RESCUE project is to radically transform the ability of responding organizations to gather, manage, use, and disseminate information within emergency response networks and to the general public. Depending upon the severity of the crisis, response may involve numerous organizations including multiple layers of government, public authorities, commercial entities, volunteer organizations, media organizations, and the public. These entities work together to save lives, preserve infrastructure and community resources, and to reestablish normalcy within the population. The efficacy of response is determined by the ability of decision-makers to understand the crisis at hand and the state of the available resources to make vital decisions. The quality of these decisions in turn depends upon the timeliness and accuracy of the information available to the responders.

The RESCUE project is an interdisciplinary effort that brings computer scientists, engineers, social scientists, and disaster science experts together to explore technological innovations in order to deliver the right information to the right people at the right time during crisis response.