Field Provider Position Tracking At Mass Gathering Events

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WIISARD (Wireless Internet Information System for Medical Response to Disasters) utilizes wireless technology to improve medical care at mass casualty disasters. An important component of WIISARD is geolocation tracking of field personnel at the disaster site. Accurate, real-time information on personnel has the potential to improve resource utilization at the disaster site, as well as increase the safety of first responders caring for victims at a hazardous scene.

Disaster response to mass casualty incidents (MCIs) represents one of the greatest challenges to a community’s emergency response system. First responders and incident managers often must provide care to many victims with limited resources, minimal information and inadequate communication tools.

WIISARD focuses on developing wireless and Internet technologies to enhance communication and real-time information availability. Key components include wireless victim tags; handheld provider devices; management and Incident Command (IC) systems; GPS-enabled wireless access points with networking, tracking and data relay units; and integrated software operating concurrently to enhance situational awareness. A key component of WIISARD is tracking the location and position of responding field providers. Accurate information improves the effective use and safety of responders at the disaster scene.

The WIISARD location tracking system uses an Assisted GPS (AGPS) capable legacy mobile handsets, carried by the field providers. The system utilizes Qualcomm’s gpSone [2] solution, where a location fix is calculated from a mix of AGPS information and cellular network trilateration (see A in Figure). A customized location tracking application in the handset reports the current location to a location tracking server over a mobile data channel (B). This location data is then processed further by the WIISARD mapping system so individual handsets can be visualized as icons on an incident area map (C). The location tracking application in the handset can also be controlled remotely by the WIISARD system, e.g. set location report intervals etc.

We conducted an operational field test of the WIISARD tracking system during a large scale mass gathering during which the system was imbedded with actual first responders. The testbed event was the San Diego Mardi Gras Festival with an estimated 40,000 revelers located in a 16 square block area of the historic Gas Lamp district 2/20/2007. Twelve roving paramedics were assigned to 2-person bicycle rapid response teams. The WIISARD mapping visualization system was established at the IC post alongside standard emergency radio communications. During the event, all teams were directed to call in their location by radio to compare with the WIISARD tracking system displayed on the IC map. The teams reported their location at cross-intersections and the WIISARD geolocation was considered accurate if it was within a ½ block of the reported location.

Overall, the paramedic teams reported their location 40 times by radio during the evening. The WIISARD location was accurate 77.5% [95% CI 65.1-89.2%]. There were technical difficulties with some of the devices for short periods of time during the event. Despite these difficulties, later in the evening, the IC dispatch center felt the accuracy was such that paramedic teams were selected to respond to incidents based on closest location as reported by WIISARD tracking system.

References: