EXTENDED REALITY FOR CHEMICAL AND BIOLOGICAL DEFENSE IN TACTICAL AND TRAINING ENVIRONMENTS

Multi-sensor Data Fusion And Visualization Of Cbrn Threats In Augmented Reality

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One of the hallmarks of modern warfare is the increasing ubiquity of sensors and platforms deployed on the battlefield. There are a wide variety of sensors integrated with platforms ranging from large vehicles,
such as the NBCRV, to drones, ground robots, light tactical off road vehicles, and on the Warfighters themselves. Collecting, analyzing, and communicating different types of sensor data is a time consuming process that is burdensome for the Warfighter and Commanders, who need to manage a lot of data inputs on the battlefield, and manually correlating these separate pieces of data is also prone to human error.
New situational awareness tools, such as Augmented Reality (AR), Virtual Reality (VR), and Mixed Reality (MR) interfaces, provide intuitive ways to visualize critical data for mission planning and operations. Additionally, these types of visualizations are further enhanced when combined with sensor data fusion to automatically interpret data from one or more systems to quickly provide the Warfighter with a clear picture of the hazards on the battlefield. GRI's solutions make these ideas and benefits a reality.

GRI offers state-of-the-art 3D radiation mapping, data fusion, and visualization technologies that enable safer, faster, and more efficient radiation detection, assessment, and response for applications ranging from emergency response to nuclear security. The GRI-LAMP system integrates advanced radiation detectors with multiple situational awareness sensors, including LiDAR, camera, and GPS, as well as the GRI 3D radiation mapping software suite, which includes computer vision-driven multi-sensor data fusion, 3D hazard visualization, AR hazard visualization, and an intuitive user interface. The compact LAMP system, weighing less than 10 lbs, is fully mobile, remotely deployable on unmanned ground and aerial vehicles (UGV/UAV) for standoff radiation mapping and offboard sensing. As the LAMP system moves through the operational environment, the 3D radiation map and AR view update in real-time and are streamed to the control tablet to provide actionable information and inform fast decision making. The GRI augmented reality data fusion software provides the ability to display radioactive hazards in augmented reality by overlaying radiation data with the visual camera feed from the GRI-LAMP system.