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

Augmented Reality Training For Cbrn Equipment

Peter Anderson MRIGlobal

MRIGlobal, in partnership with ForgeFX Simulations, has developed a simulation-based augmented reality (AR) training tool for warfighters to aid in handheld chemical, biological, radiological, and nuclear (CBRN) device familiarization. This tool utilizes a Microsoft HoloLens 2.0 headset to provide a user with interactive device training that can be used anytime, anywhere providing a flexible option to typical user learning. The use of AR enables users to learn new procedures, assess their skills, troubleshoot issues, and enhance refresher training by mixing hands-on device training with a virtualized environment. The AR training interface allows for any number of device trainers to be loaded onto the Microsoft HoloLens. A user navigates the virtual menu by using hand gestures to select menus and interface with the virtual devices. The AR Training platform is developed in the Unity game engine allowing for high resolution graphics and realistic models of the handheld devices. The interface is very intuitive and most users gain basic proficiency with the first few minutes of interaction after becoming comfortable with the steps to use AR.

Multiuser Augmented Reality allows for multiple team members, outfitted with HoloLens 2.0 headsets, to see the same virtual device at the same time in the same place. In a training context, this allows for users to practice as a team or for more senior warfighters to guide less seasoned team members through virtual training exercises. Available network architectures include peer-to-peer, and client-server. The peer-to-peer configuration is most appropriate for local-area communications which need to be independent of any public networks. The client-server architecture is most appropriate when trainees are geographically distant from one another and reliance on a distributed internet (IP) style is acceptable. An excellent example of this multi-user capability is the MRIGlobal developed Checkpoint: Augmented Reality Tabletop Mission Planner, which end users equipped with the HoloLens 2.0 can visualize, discuss, plan, and practice interactive mission scenarios from remote locations.

MRIGlobal's current contract within JPM CBRN SOF is for development of 15 individual training modules, each focusing on a specific handheld CBRN detection device. Features and benefits of the MRIGlobal AR CBRN training modules include 1) Safety – in the virtual environment, trainees can experience learning-errors which increase proficiency without the worry of damaging sensitive equipment or harming themselves, 2) Remote Training - creating a portable, compact virtual maintenance kit allows for training, at any location, with life-sized virtual equipment, 3) Access to CBRN Equipment Suite – a single AR headset can include an extensive suite of virtual equipment for CBRN training, regardless of location or availability of "hands-on" hardware, 4) Scalable Training – customizable AR training modules can provide DIY training, geared directly to the mission and skill-level of the CBRN warfighter or to train multiple end-users simultaneously, and 5) Cost Savings – virtual training eliminates the need for costly consumables and allows users to get virtual access to often very expensive pieces of equipment all while eliminated downtime of the actual equipment.