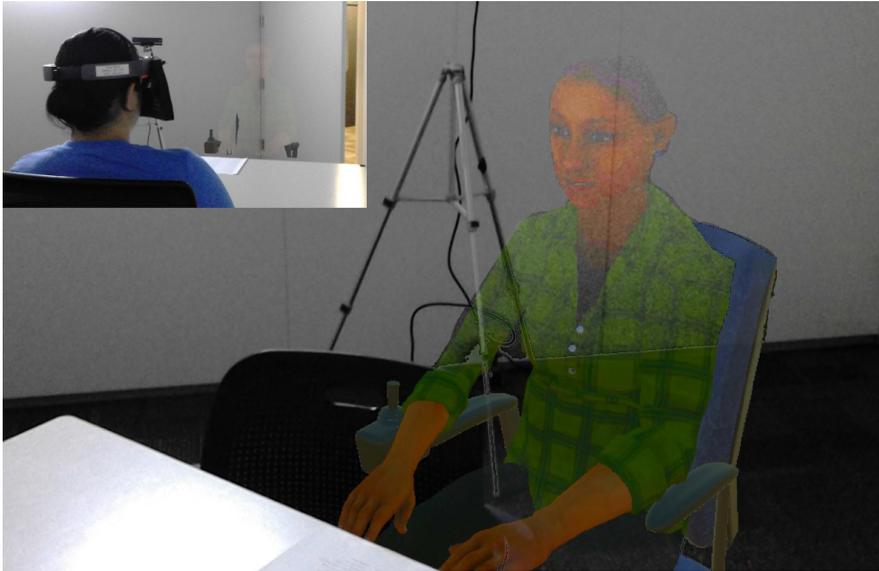




PROVIDING AN ALTERNATIVE FOR PROHIBITIVELY COSTLY OR DANGEROUS LIVE TRAINING

The U.S. military trains and assesses warfighters in a variety of tasks. Augmented Reality (AR) integrates digital representations of objects or people into a trainee's view of the real world. AR-based training can provide a balance between prohibitively costly or dangerous live training, and pure Virtual Reality interactions that lack real physical context or live interactions with other people. Trainee motion paths and other behaviors, along with real-time or recorded AR imagery from the trainee's perspective, can provide an excellent source of information for in/after-action review. AR also allows for seamless visual integration of external sensor data or navigational aids to guide users within the context of physical, spatial training scenarios.

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SEARCH AND NAVIGATION TRAINING

Visual search for objects in the presence of dangerous entities is one example of a training task that is well-suited for an AR interaction. In this demonstration, participants are asked to perform a search task under time pressure, looking for a specific object within a physical space that is populated with hidden potential hazards. A virtual human provides an introduction and basis for the search scenario and virtual animations and effects are used to visually augment the physical search space with the potential hazards and the object of interest. Trainees will wear a head-worn AR device and navigate the physical task area by natural locomotion, assessing and reacting to hazards, all within the context of an object search task.

AUGMENTED REALITY TO SUPPORT TACTICAL DECISION GAMES



Another potential training application of AR is providing 3D visualizations that can be seen by multiple users. Terrain for sand table exercises is one such visualization of interest to the military. Sand tables and physical terrain models are widely used in military training and operations. The sandtable HoloLens application demonstration provides a collaborative multi-student environment enabling realistic depictions of 3D real-world

terrains and unit placements. It facilitates the understanding of contour maps as 3D terrains and the importance of battlefield geometry. It is designed to be used with the Interactive Tactical Decision Game, a web-based application for facilitating and enhancing traditional Tactical Decision Games.

INTERACTIVE SCENE ANNOTATION AND VIEWING

Lastly, we will demonstrate mobile augmented reality input and output technology by inviting the audience to create and browse annotations of physical objects with hand-drawn and gesture-enhanced “3D drawing” annotations. In our scenario, the audience member, in the role of a mobile squad leader, will be enabled to highlight physical objects that are to be inspected later by a team of specialists. The options for highlighting physical objects include direct 3D sketching and annotation from a distance using a novel 3D gesture recognition and enhancement process. Shared optimized viewing of annotations issued by other squad leaders (either previously or live) is also part of the experience.

This application highlights the capability to augment the live scene with virtual markers that could be highly useful for military training and operations as a way to communicate a threat, area of interest, etc. with team members to ensure shared situational awareness.

