BEMR: A new reality for the future force

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Lt. Jeff Kee explores the Office of Naval Research (ONR)-sponsored Battlespace Exploitation of Mixed Reality (BEMR) Lab located at Space and Naval Warfare Systems Center Pacific. BEMR is designed to showcase and demonstrate cutting-edge, low-cost commercial-mixed reality, virtual reality and augmented reality technologies-and to provide a facility where warfighters, researchers, government, industry and academia can collaborate. Credit: U.S. Navy photo by John F. Williams/Released

New virtual-reality capabilities emerging at the Battlespace Exploitation of Mixed Reality—or BEMR—Lab, in San Diego, California, will make dramatic impacts across the Navy and Marine Corps, including advancements in affordable virtual training, data assessment, firing of weapons and even basic concepts of operations.

"The BEMR Lab is a constellation of technologies in augmented and virtual reality," said Karl Van Orden, senior technologist at the BEMR Lab. "It's a place where we can explore how to exploit those technologies in our warfighting systems."

When people think of virtual reality, many imagine Tony Stark from the "Iron Man" movies, hands raised and moving virtual displays projected in front of him. While that might be fanciful now, Navy engineers are working hard to develop such capabilities.

Virtual reality (VR) describes a scenario where a participant is completely immersed in a simulated/virtual world. Augmented reality (AR), by contrast, is used to describe a state where virtual objects are imposed onto real-world vision, like the yellow lines superimposed on televised sports.

When these technologies are merged, and one can easily jump between states of virtuality, it's called Mixed Reality, or MxR.

As the video shows, the BEMR Lab team believes this technology is ready now. Their vision: The future force will soon train and operate in very different ways.

"What mixed reality is all about is immersion—you want to get the warfighter feeling like he's really in the space," said BEMR Lab lead Heidi Buck.

Importantly, advanced VR and AR capabilities will utilize the skills of young Sailors and Marines.

"The modern naval force has grown up with computers at home, video games, arcades and head-mounted displays in their personal life," noted Dr. Lawrence Schuette, director of research at ONR. "Coming to float and seeing it onboard ship is just a logical extension."

Senior naval leadership has called for increased use of technological advances. In a recent address at the Reagan National Defense Forum, Chief of Naval Operations Adm. John Richardson said: "It's about the team that can bring the people, the technology and the processes together to learn the fastest—that's the team that has the advantage."

Virtual technologies could result in significant cost savings—for example:

- Training: Where the warfighter might currently need to fly to a specific spot for training, he or she could don the MxR gear and "be there" virtually, completing training at a fraction of the cost.
- Maintenance: MxR technologies can have a subject matter expert "standing" next to Sailors or Marines as they troubleshoot a difficult problem—even if the expert is on the other side of the world.
- Operations: MxR technologies will give operators views never before seen, with striking fidelity, to execute missions to exacting standards.

And the BEMR Lab team is utilizing low-cost, commercial-off-the-shelf technologies, like Oculus Rift VR goggles.

The effort ties in to the Naval S&T Strategy, which calls for leveraging advancements in a "rapidly changing landscape of new technologies."

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