



Kratos Defense & Security Solutions, Inc. (NASDAQ:KTOS) develops and fields transformative, affordable technology, platforms and systems for United States National Security related customers, allies and commercial enterprises.

Employing 2900 people worldwide, Kratos specializes in unmanned systems, satellite communications, cyber security/warfare, microwave electronics, missile defense, hypersonic systems and training. Kratos is a leading provider of state-of-the-art, unmanned tactical aerial platforms and high-performance aerial target systems for U.S. and allied warfighters. Kratos satellite ground solutions, products and services support more than 85% of U.S. space missions and 75% of all commercial satellite operations. Kratos training solutions is the subject of this profile.

MISSION

Today, hands-on, real world training is being supplemented with virtual, augmented and mixed reality training scenarios. Kratos' military training mission is simple: Improve warfighter survivability and lethality with the latest in simulation and mixed reality training technologies.

IMMERSIVE AND SEMI-IMMERSIVE TRAINING ENVIRONMENTS

To help ensure warfighters are ready for battle, resilient to evolving tactics and able to quickly recover from setbacks, Kratos integrates the latest in Virtual Reality (VR), Augmented Reality (AR) and Mixed Reality (MR) technology with its state of the art simulation systems and instructional design capabilities to create immersive and semi-immersive training environments.

A MIXED REALITY PRIMER

VIRTUAL REALITY (VR)

Completely digital environment



Fully enclosed, synthetic experience with no sense of the real world

AUGMENTED REALITY (AR)

Real world with digital information overlay



Real world remains central to the experience, enhanced by virtual details

MIXED REALITY (MR)

Real and the virtual are intertwined



Interaction with and manipulation of both the physical and virtual environment

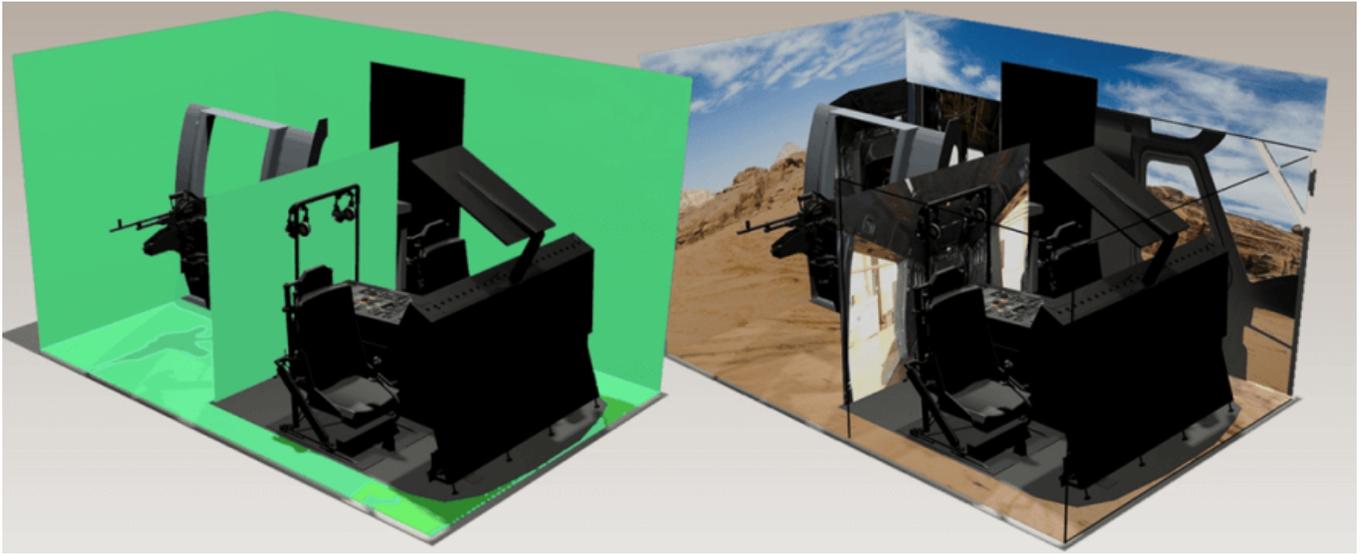
Mixed Reality is the result of blending the physical world with the digital world –the next evolution in human, computer, and environment interaction –and unlocks possibilities that were previously restricted to our imaginations. It is made possible by advancements in computer vision, graphical processing power, display technology, and input systems. The application of mixed reality includes environmental input, spatial sound, and location.

Advancements in sensors and processing are giving rise to a new area of computer input from environments. The interaction between computers and environments is effectively environmental understanding, or perception. Environmental input captures things like a person's position in the world (e.g., head tracking), surfaces and boundaries (e.g., spatial mapping and spatial understanding), ambient lighting, environmental sound, object recognition, and location.

Now, the combination of all three – computer processing, human input, and environmental input – sets the opportunity to create true mixed reality experiences. Movement through the physical world can translate to movement in the digital world. Boundaries in the physical world can influence application experiences, such as game play, in the digital world. Without environmental input, experiences cannot blend between the physical and digital realities.

A MIXED REALITY PLATFORM

The key differentiator of MR is that it enables digital content and real-world content to interact with each other in real-time, in ways beyond AR and VR. The effects of tactile, audio, and visual sensory cues on a participant's sense of presence in a virtual environment directly correlate to the success of training. Kratos' innovative MR platform makes those sensory experiences real and intense, creating a fully immersive experience that truly mimics the combat environment. A potentially disruptive technology, Kratos' MR platform is currently being evaluated by DoD components to appraise next generation technology and products for soldier lethality and air traffic control training.



Interior of Kratos Holodeck platform in rotary wing configuration – reality view (Left), and (Right) virtual view. Crew members will see instrumentation and controls, as well as virtual surroundings via the MR HMD

TRAINING AT THE POINT OF NEED

The platform's key advantage is that it enables MR-based training to be delivered to the point of need (PoN) – virtually anywhere. The light source panels can be configured to accommodate various sizes and shapes– from rotary aircraft cabins, to tracked vehicles or marksmanship firing ranges and to the Kratos Holodeck.



Mixed Reality (MR)–where virtual and real environments can co-exist. Interior of Kratos holodeck: visual on left pictures student in holodecks (green rooms); visuals on right shows what student sees with helmet mounted display (HMD)

SIMULATION AND TRAINING DEVICES

For two decades Kratos has designed and manufactured state-of-the-art air, ground and naval simulation systems for U.S. and allied forces. Kratos combines virtual and physical components with course development products to create courseware that maximizes training realism. Kratos is now integrating AR, VR and MR technologies into these systems to achieve greater immersiveness and a more realistic combat experience.

COURSE DEVELOPMENT

Kratos develops performance-driven learning solutions with a rigorous systematic design process that employs theories of cognition, motivation, adult learning theory and a criterion-based framework. Kratos can automate the development of the simulation based curriculum and Interactive Media Instruction (IMI) thus integrating the simulation and virtual elements for all phases of training.

KRATOS AIRCREW TRAINING CENTER (KATC)

The KATC aircrew simulators provide aircrew members with training equivalent to what they would have received on their own simulator or aircraft. The Air Force Global Strike Command (AFGSC) has approved KATC's Aerial Gunnery Trainer (AGT) Simulator to be used in crediting sorties toward some of their annual aerial gunnery training requirements: evidence that virtual reality is increasingly becoming a viable complement to live training.

CORPORATE STRUCTURE

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