

A Seventeenth Major Improvement to the Integrated Visual Augmentation System

A third Soldier-specific 3D rendering method for nausea reduction

USA, August 4, 2023 /

EINPresswire.com/ -- [TPMI](#) is dedicated to improving several aspects of the Integrated Visual Augmentation System ([IVAS](#)) program to make it a major success. An immediate item of concern for the program is solving the nausea problem many Soldiers are facing while wearing the IVAS. Fortunately, TPMI has solutions.

In two recent articles, TPMI discussed its patented Soldier-specific 3D rendering technologies called "tandem 3D rendering" and "preemptive 3D rendering". Since both of these technologies reduce lag-time, a well-documented source of nausea in extended reality applications, they hold promise in reducing Soldier nausea.

Today, an additional technology is discussed to further reduce nausea and improve the usability of the IVAS.

Consider a scenario. A Soldier is walking through an aspen tree forest and a virtual object placed within the forest at a distance 20 meters away. As the soldier passes a set of aspen trees or fallen branches in the foreground, the virtual object must appear while there is line of sight and disappear while blocked by an aspen tree in the foreground to obtain a realistic experience. Another similar scenario is a Soldier walking through the city with different objects in the foreground at different points along the street.

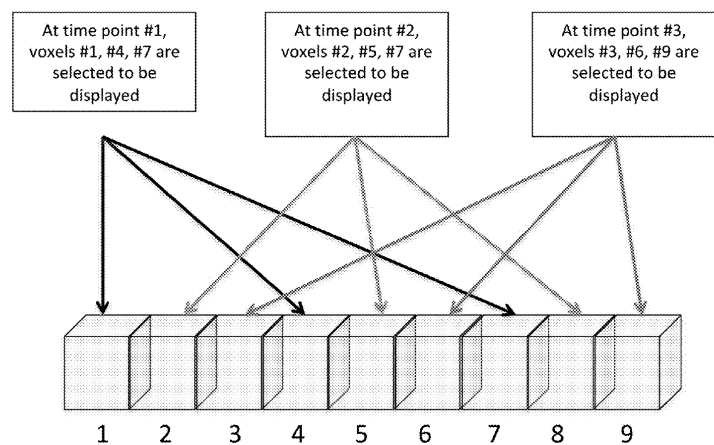
Errors in overlap (e.g., the distant virtual object being displayed on the IVAS while it should be

U.S. Patent

Mar. 30, 2021

Sheet 6 of 10

US 10,964,124 B1



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hidden) will compromise the viewing experience. Since overlap is a primary depth cue, an error in overlap can generate a confusing and distorted appearance.

A Soldier is required to wear the IVAS for hours on end. Soldiers must not experience overlap-type distortion for prolonged periods of time. But the question is "how do you get rid of it?"

TPMI's 11,006,100 patented technology provides placement of LIDAR on an IVAS system. This would provide a high precision map and importantly determine when the line of sight from the IVAS to the distant virtual object is blocked by a foreground object. US Patent 10,964,124 provides a patented technique called "dynamic filtering", which dynamically removes portions of virtual objects from the scene during certain time periods (i.e., when line of sight to portions of the distant virtual object is blocked) and then adds those same portions back in during other time periods (i.e., when there is line of sight).

Implementation of the '124 patent will enable virtual objects in the distance to be appropriately rendered as objects in the foreground come and go. This will eliminate the confusing and distorted appearance caused by errors in overlap.

In order for Soldiers to want to use the IVAS, the problem of nausea absolutely must be eliminated. TPMI aims to work with [PEO Soldier](#) to enhance the IVAS system by integrating this novel technology into the IVAS system.

About the author: Dr. Robert Douglas is a West Point graduate who: fought as an Infantryman in Vietnam with US units and a Vietnam recon company; worked in a combat development agency; studied nuclear war in the Joint Chiefs of Staff; patrolled in the desert for the UN in the Middle East with Russian war planners; and developed a system to assist Air Force space exercises. After leaving the service he spent over three decades in the defense industry rising from manager to vice president working programs ranging from sensors and missiles for Air Force aircraft to rubbing shoulders with Army scientists; to Army helicopters and combat vehicles as well as rapid target acquisition, night vision goggles and weapon sights.

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