

A Thirteenth Major Improvement to the Integrated Visual Augmentation System

An additional Soldier-specific 3D rendering technique to reduce Soldier nausea

USA, July 31, 2023 /EINPresswire.com/ -- Soldier nausea is a problem that has adversely affected the Integrated Visual Augmentation System (IVAS). Simply put, in order for the IVAS to be adopted, the problem of nausea must be eliminated.

Some 3D virtual scenes are extremely complex. Consider this - some 3D virtual scenes have tens or even hundreds of millions of polygons. Achieving rapid rendering at the recommended 90 Hz must be performed -- and, a key source of nausea is lag in the displayed images.

On a 27 July 2023 article, [TPMI](#) discussed a technique in US Patent 10,964,095 called "tandem rendering". Tandem 3D rendering divides a 3D virtual scene and performs two types of rendering, which reduces lag and still maintains high quality rendering for important portions of the scene.

Today, TPMI discloses a second Soldier-specific 3D rendering technique set to achieve the highest possible quality rendering of the entire scene with stereoscopic imagery displayed at 90 Hz. In US Patent 11,625,891, a list of possible views of the 3D virtual scene are generated. For each possible view of the 3D virtual scene, a left eye image and a right eye image are pre-emptively rendered. Note that the pre-emptive rendering is done before the Soldier maneuvers his head to one of the possible views. Thus, when a Soldier maneuvers his head to one of the possible views, the corresponding left eye image and right eye image would be immediately available for display rather than having to be rendered.

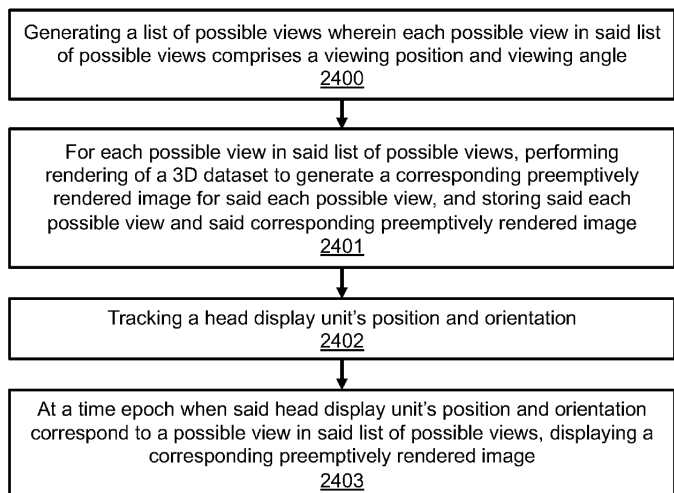
U.S. Patent

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PREEMPTIVE VOLUME RENDERING



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So, rather than starting the complex rendering after the Soldier's head maneuvers to a particular position, the '891 patent performs the complex rendering beforehand. By cutting out the lag time, this technique would significantly reduce Soldier nausea.

A number of clues can be used to specifically determine which views to preemptively render. For example, a predetermined event within the 3D virtual scene (e.g., virtual shots fired from the East direction) could be a triggering event for pre-emptively rendering images from the East. Additionally, another Soldier shouting for help from the South could be a triggering event for pre-emptively rendering images from the South. Finally, TPMI's 28 July 2023 article discussed using AI to predict a Soldier's behavior -- with a future Soldier head next head position predicted, the 3D virtual scene can be preemptively rendered.

TPMI has a platform of technology which, if integrated into an upgraded IVAS, would result in a superior system and more usable to the Soldier by cutting lag-time associated nausea. TPMI aims to work with [PEO Soldier](#) to integrate this novel technology into the IVAS.

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 (RTA), night vision goggles and weapon sights.

Dr. Robert Douglas

TPMI

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