

A 28th Major Improvement to the Integrated Visual Augmentation System

Generating a realistic One World Terrain for enhanced simulation

USA, September 22, 2023 /EINPresswire.com/ -- A major reason for the Integrated Visual Augmentation System (IVAS) is to enable a battle to be rehearsed many times before having to actually fighting it. Consider a situation wherein the battalion/ brigade S3 Operations Officer is tasked with preparing a training exercise for key members of the unit or for the entire unit itself. The commander wants the exercise to be as realistic as possible and the participants are to use their IVASs. A realistic One World Terrain (OWT) would improve training and understanding for participants in the S3's exercise. TPMIs US Patent 10,878,639 can be evoked to help solve this challenge. Let me explain.

First, the unit S3 would need to download the portion of One World Terrain (OWT) relevant to his/ her selected area for the training exercise. The S3 could then don his/ her IVAS and carefully inspect



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the area noting items such as trees, rocks, roads, lake, river, cars, buildings, etc. US 10,878,639 enables segmentation of the virtual dataset into discrete virtual structures corresponding to the tangible structures and, subsequently, assigns material type properties to the discrete virtual structures corresponding corresponding to the tangible structures. The OWT, improved with the '639 patent, would be comprised of virtual structures with material type properties corresponding to the tangible structures. For example, a virtual tree trunk would be assigned material property of wood. A virtual side walk would be assigned the material property of concrete. The OWT upgraded with the '639 patent would be REALISTIC by enabling virtual structures to undergo subsequent manipulation and modeling in accordance with the assigned material type property.

A scenario can then be created with selected control measures such as lines of departures,

routes of approach, and objective areas, which could be marked on the OWT using tangible tools per <u>TPMI</u>'s '<u>133</u> patent. The battlefield could be transformed with insertion of virtual weapon systems per TPMI's '071 patent. As the scenario unfolds the OPFOR can realistically manipulate the OWT per TPMI's '639 patent (e.g., blow up a bridge or road segment which, in turn, changes the virtual terrain observed by exercise participants on IVAS). The friendly force can also interact with the virtual threat objects inserted into the manipulated tangible terrain (e.g., fire called in when threat objects are sighted). SEEING THE ACTION UNFOLD IN 3D IN NEAR REAL TIME WOULD ADD TREMENDOUS REALISM TO THE TRAINING EXERCISE. Importantly, multiple users could view the marked up, transformed 3D battlefield using TPMI's multi-user rendering technique per TPMI's '<u>435</u> patent.

After action reviews could be conducted by presenting the recorded activities. Learning points can be integrated during the re-playing of the scenario which would further enhance training. Note also that once the manipulated OWT has been prepared, it could readily be re-manipulated (e.g., blow up a different virtual bridge) for a subsequent exercise. Thus the goal of rehearsing the battle many times before it is fought could be achieved.

Integrating TPMI's '639 along with TPMI's '035, '133, '071 and '435 patented technologies into the IVAS which were featured the 24th, 25th, 26th and 27th major improvements to IVAS is an important step towards enabling Army personnel to have the ability to interact with the OWT in training exercises in a more REALISTIC fashion. TPMI aims to work with PEO Soldier and PEO STRI to integrate these novel technologies into the IVAS.

About the author: Dr. Robert Douglas is one of the few known retired Infantrymen who have 80+ USPTO awarded patents. This article discusses only a small subset of the vast array of technologies in the above patents. This was the 28th patent discussed in this series of articles that is relevant toward improving the military/ IVAS goggles. Although only one concept is selected from each patent for the associated article, in fact, each patent includes many relevant concepts. More to come on Artificial Intelligence (AI), Augmented Reality (AR), Mixed Reality (MR), and Virtual Reality (VR).

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