

A 30th Major Improvement to the Integrated Visual Augmentation System

Enhancing a LIDAR generated 3D dataset to facilitate battlefield visualization

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/EINPresswire.com/ -- Wikipedia states "The Kosovo War was an armed conflict in Kosovo that lasted from 28 February 1998 until 11 June 1999. It was fought between the forces of the Federal Republic of Yugoslavia (i.e. Serbia and Montenegro), which controlled Kosovo before the war, and the Kosovo Albanian rebel group known as the Kosovo Liberation Army (KLA). The conflict ended when the North Atlantic Treaty Organization (NATO) intervened by beginning air strikes in March 1999 which resulted in Yugoslav forces withdrawing from Kosovo."

The war came as a complete surprise to many. What if a similar war, somewhere else, were to start in the near future. Looking back at Kosovo, units completely disappeared into deep forests. When the war ended, tanks emerged completely unharmed. Recce operations appeared to be the blind leading the blind.

Now, consider a future similar operation wherein the One World Terrain (OWT) dataset guides operations. During changing operations, some portions of the One World Terrain (OWT) would be relevant and other portions would likely have changed (e.g., because the OWT maps become out of date). Like Kosovo, suppose the disposition of forces is very uncertain. Key elements could have gone into the forests where they can't readily be detected by typical recce systems. What to do? [TPMI's Patent US 10,950,338](#), if integrated into Integrated Visual Augmentation System (IVAS), could facilitate an improved operation. Let me explain.

For this scenario, we postulate that a US Task Force has been ordered into the area of conflict with the mission separating the opposing forces and creating a peace zone. An early step would

(12) **United States Patent Douglas**

(54) **METHOD AND APPARATUS FOR GENERATING AN ARTIFICIAL INTELLIGENCE 3D DATASET AND PERFORMING INTERACTIVE MANIPULATION AND RENDERING OF THE DATASET**

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be to have LIDAR completely cover the area of operations. The return data would be a very large 3D data set. Data elements could include elevation (or distance down from the LIDAR aircraft) and reflectivity. Reflectivity would be different for trees vs. camouflage nets, roads vs. vehicles, concrete buildings vs. steel, etc. Roads going through forested areas could disappear. And, where are all those tanks hiding in the forest? TPMI '338 patented technology applies artificial intelligence (AI) to the 3D dataset, segments the 3D data set into discrete structures and assigns properties to them such as vegetation vs. camouflage material. Tops of trees can be removed and, where the laser beams got through the tree leaves, tanks could be exposed/ outlined. Bunkers would be exposed. Assuming different types of equipment on opposing sides, mensuration could be performed, and forces delineated.

Now, when the commander, who happens to like the virtual sand table, asks the G2/ S2 to prepare one, voila! It can happen. The virtual sand table could be replete with force elements and fortifications. The G3/ S3 could overlay his proposed plan. The commander and his/ her staff would all have an accurate visualization of the battlefield.

Integrating TPMI's '338 with TPMI's ['635](#), ['639](#), '035, '133, '071 and '435 patented technologies into the IVAS which were featured several recent articles discussing major improvements to the IVAS. This is an important step towards enabling Army personnel to have the ability to interact with the OWT in training exercises and combat situations. 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 30th patent discussed in this series of articles that is relevant toward improving the military/ IVAS. 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). Dr. Douglas is keeping at it – he is currently under a consulting contract to CESI, the SETA contractor for OneSAF, and using that model, with Army approval, to assess effectiveness of advanced sensor systems.

Dr. Robert Douglas

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