A Fourteenth Major Improvement to the Integrated Visual Augmentation System

To optimize image analysis using an AI-assisted consultation process during reconnaissance missions

USA, August 1, 2023 /EINPresswire.com/ -- In Army operations, the purpose of reconnaissance missions is to obtain information about enemy forces. Army Rangers are well suited to perform force-oriented reconnaissance to gather important intelligence on enemy forces such as the number of combatants, types and number of military equipment, and current activities. Often, a Soldier sees an object, but is uncertain of what exactly it is.

PEO Soldier's Integrated Visual Augmentation System (IVAS) has great potential to improve effectiveness of reconnaissance missions. The IVAS has advanced sensor systems, which have the capability of imaging the surrounding environment, such as imaging an object during a reconnaissance mission.

Consider a Ranger who sees an object on a recon mission and determines that it is some kind of armored vehicle, but has no idea which one. Such imaging data

| U.S. Patent | May 11, 2021 | Sheet 5 of 13 | US 11,003,948 B1 |

SMART IMAGE CONSULTING PROCESS

Identifying a first user's image(s) to be reviewed by a second user consultant (Option to mark up the image to be reviewed)
500

Identifying a second user consultant to review the image(s)
(Option for a third user studies to find the most appropriate match between the image and the second user consultant;
Option for AI to find the most appropriate match between the image and the second user consultant)
501

Displaying the image(s) to the second user
(Option: the second user could be a group of users)
502

Proividing feedback, by the second user, to the first user
(Option: image markup by second user; sending similar cases to first user, etc.)
503

Options:
• Displaying mark up from second user onto first user's screen
• Second user edits first user's mark up
• Second user performs image labeling (e.g., anatomy)
• Real time viewing of same image
• Voice communications
• Feedback from second user to third user (good consult or bad consult)
• Requiring a payment from the first user
• Providing a reward to the second user (consultant's reward)
• Providing a reward to the third user (matchmaker's reward)
• Rating system for user(s) (first, second or third)
504

Fig. 5

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needs to be type classified as it is pertinent to determine next steps in the mission. Artificial Intelligence (AI) has shown some potential in classification of objects; however, it has not replaced human imaging experts.

In military operations, the timeliness of information can be critical, yet there can be dozens of different imaging subject matter experts, so an important question is -- which imaging expert is the one to receive the image for classification? For example, one imaging expert can narrow it down to a self propelled artillery vehicle, but is not exactly sure which one. Another expert might be skilled to readily distinguish between a Russian 2S19 Msta-S, a 2S23 Nona-SVK or a S234 Chosta, even on a low quality image. So, the question arises -- how to get a definitive answer by correct subject matter expert immediately?
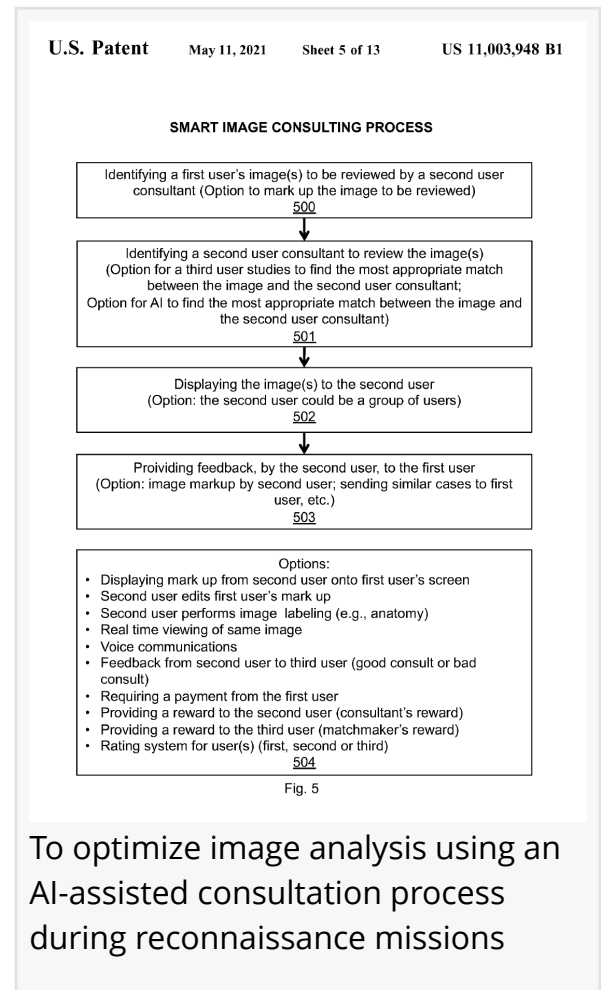
In US Patent 11,003,948, [TPMI](#) has developed a solution to instantly get the answer to both the Soldier on the ground performing the recon and the leadership in the headquarters. To accomplish this, TPMI uses an AI system as an intermediary to analyze the imagery and instantly select the most appropriate subject matter expert out of any size group of imaging experts – in the above example, it would be an expert in Russian artillery. TPMI's '948 patented technology will yield not only the classification from the optimum subject matter expert, but will do so in the fastest possible methodology. Thus, TPMI's '948 technology not only has applications for the Army, but it could also have utility for the intelligence community.

With a rapid and accurate classification, the result of a 2S23 Nona-SVK could be near instantly passed to both the leadership and the Ranger resulting in real-time, informed decision making for the Army. Questions like "should further recon be performed?" can be reliably answered.

The words "Visual Augmentation" in the Integrated Visual Augmentation System (IVAS) are at the heart of TPMI's patented technology. TPMI has a platform of technology which, if integrated into an upgraded IVAS, would result in a superior system. 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, night vision goggles and weapon sights.

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