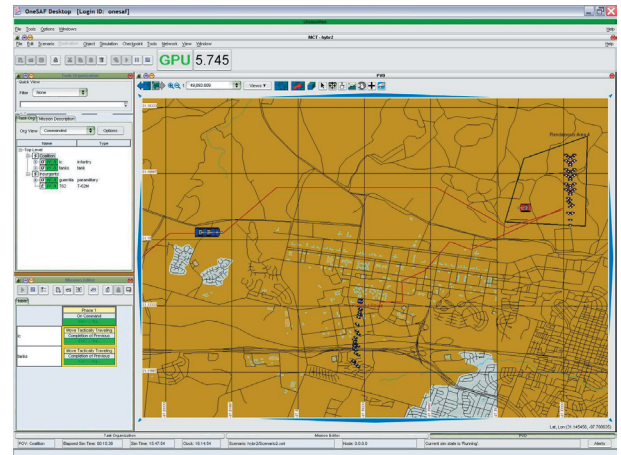# Accelerating OneSAF with Graphics Processing Units (GPU)

Product Description

Graphics processing units (GPUs) provide the capability to accelerate runtime processing speed of the One Semi-Automated Forces (OneSAF) Computer Generated Forces (CGF) simulation by converting and migrating core algorithms from the host central processing unit (CPU) to on-board auxiliary graphics hardware. OneSAF is a composable simulation that is capable of modeling a range of entities from individual combatants (IC) to platforms. It allows operators, through graphical user interfaces (GUIs), to compose entities, units, sophisticated behaviors and scenarios at various levels of fidelity. OneSAF provides the capability to effectively and accurately represent warfare, communications, combat support and combat service support, currently focused on land warfare.

Fort Hood Route Planning GPU

Key Capabilities

SAIC, in collaboration with the University of North Carolina, has created new GPU line of sight (LOS) and route planning algorithms to take advantage of GPU technology that can be used within OneSAF. A hybrid CPU/GPU-accelerated algorithm is used to conservatively cull queries with definite LOS. Furthermore, a GPU-accelerated algorithm is used to perform conservative culling of both non-overlapping route segments and terrain features. These GPU-based algorithms have been able to offload process time from the CPU, which allows OneSAF the capability to accelerate runtime processing speeds.

User Benefits

- Overall system performance increase of 20x using LOS
- Overall system performance increase of 10x using route planning
- Improvements in simulation training exercises
  - Increased entity count
  - Higher fidelity models and behaviors
  - Use of complex urban environments
- COTS hardware

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