Abstract ID: 16047

Title: Making Terrain and Models portable using 3D GeoPDFs

Subcommittee: Emerging Concepts and Innovative Technologies

Abstract Text:
The simulation landscape of today is afflicted with a myriad of simulation systems and visual image generators, each requiring multiple, often proprietary, data formats along with stringent hardware requirements and a team of qualified technical personnel for proper utilization. Many of the next generation streamlined gaming engines even require at least a high-performance PC, for optimal operation. These strict infrastructure requirements can create burdensome barriers for users looking for rapid verification of elements such as the contents of a synthetic environment representation or the visual representation of a 3D entity model. Other limitations such as geographic proximity, unavailability of qualified technical manpower, and cybersecurity are very real issues faced by users when timely access to a simulation environment or model is required.

Through experience with limitations like these, the Synthetic Environment Core (SE Core) program has validated the need and developed the capability to export a system agnostic three-dimensional (3D) model format that is accessible to all simulation stakeholders regardless of technical competency or infrastructure availability. This capability relies upon the widely utilized and globally recognized open Portable Document Format standard – more commonly known as PDF. Much like its two-dimensional counterpart, a 3D PDF retains all the visual formatting and geo-spatial registered attribution of its original source, while allowing it to be commonly accessible by all users across the full spectrum of computing hardware and portable devices.

The objective of this paper is to present a methodology for the generation of these common 3D PDF documents utilizing both synthetic environment terrain and 3D model data. This paper will also highlight ongoing innovative use cases for this capability across the Department of Defense (DoD) Modeling and Simulation (M&S) domain from terrain or model validation to end user mission planning, as well as discuss implications to the wider M&S user community as a whole.

Will this paper have one or more authors from outside the U.S.?

No

Discussion Points:
1. synthetic terrain
2. geoPDF
3. model
4. portable
5. common format

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Thomas Kehl is the Government Integration and Test (I&T) Lead Systems Engineer for the Synthetic Environment Core (SE Core) program at the U.S. Army PEO STR1. Mr. Kehl is responsible for overseeing the day-to-day testing and evaluation of SE Core terrain representations, as well as managing the overarching database test schedule in the live, virtual, constructive, and gaming system environments. Mr. Kehl holds a Masters Degree in Electrical Engineering from the University of Central Florida and is currently pursuing his PhD in Modeling and Simulation from there as well. Mr. Kehl is also a proud member of the U.S. Army Acquisition Corp.

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Herman M. Patel is a senior engineer at Vizom3D in Orlando, Fl. He is currently on the SE Core CVEM program. Mr. Patel received his Bachelors of Science degree in Electrical Engineering from the University of Florida. He has been working with simulation and training systems since 2010 and has more than 9 years of experience in software testing and system integration.

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Status: APPROVED
## IITSEC ABSTRACT SCORING FORM

**Abstract ID REF**: 16047  
**Title**: Making Terrain and Models Portable using 3D GeoPDFs  
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### Emerging Concepts and Innovative Technologies
- Papers describing Emerging Concepts or Innovative Technologies founded in scientific principles.
- The subcommittee is seeking papers that discuss emerging and innovative technologies, methodologies, or concepts associated with training, simulation, and education across the spectrum of government, industry, academia, and international. Candidate papers should thoroughly describe a concept, methodology, or technology and the challenges that it is intended to address. In reviewing these papers, the subcommittee is especially interested in understanding how the concept or technology advances the state of the art, and how it demonstrates or acknowledges prior related work in the subject area, rather than its use in a specific application for training, education, or simulation. Special consideration will be given to papers that incorporate solid research principles while presenting results of the research and providing detailed conclusions/recommendations.

### Evaluation

**Substance**: The controlling idea and the support for it. The total concept the author wants to present. A good idea can survive mechanical flaws, but perfect spelling and grammar can't save poor ideas.

**Originality**: A new concept that furthers the evolution of the committee's subject area. A repeat of past theories that add nothing to the community of knowledge are generally unacceptable, unless the prospective abstract/paper promises to impart knowledge that may be of substantive value to a novice audience.

### Acceptance
- **Accept**
- **Reject**
- **Discuss**
- **Suggest Pitch**
- **Similar Abstract**
- **Transfer to**

### Key Words or Concepts

### Other Comments/Remarks