

Abstract Submission for the 2007 ITEA Modeling and Simulation Conference
December 10-13, 2006
Las Cruces, New Mexico

Geospatial-Intelligence (GEOINT) Modeling and Simulation

Edward J. Mayhew, Jr.
Senior Modeling and Simulation Engineer
Quadelta, Inc.
85 S. Bragg - Suite 302
Alexandria, Virginia 22312-2793
(703) 354-0700
(434) 296-7742
FAX: (703) 354-0701
emayhew@quadelta.com

ITEA M&S Conference sessions most relevant to this abstract:

M & S Technologies - Virtual Environments

High Performance Computing in Test and Experimentation - High-fidelity synthetic environments

High Performance Computing in Test and Experimentation - Data exploitation and visualization

Abstract

The National Geospatial-Intelligence Agency's (NGA) definition of GEOINT is the exploitation and analysis of imagery and geospatial information to describe, assess, and visually depict physical features and geographically referenced activities such as

- research and develop new methods and capabilities to solve the most challenging GEOINT problems.
- visualize the Earth's natural features to support national policy objectives, weapon and satellite system development and testing, disaster relief projects, and combat and training missions.
- analyze and display aeronautical and marine GEOINT to ensure safe navigation of military aircraft and marine vessels.

High-Level Purpose:

To provide a cost-effective, high-fidelity synthetic environments for Intelligence, Surveillance and Reconnaissance (ISR) applications as well as for the testing and evaluation of any application that requires the exploitation of GEOINT data.

Procedure:

- Select the desired NGA information that would include terrain data and aerial imagery.
- Use selected data to generate the terrain of the scene.
- Determine which sky would be most applicable to the mission.
- Determine the number of cameras to be included in the synthetic environment and their locations
- Apply the waypoints that drive the cameras or the vehicles in the scene (or apply the physics engines that drive all)
- Run the simulation at any speed desirable

Features:

- Areas can be as large as hardware specifications will allow
- Camera positions and orientation virtually unlimited .
- Cost-effective
- Full zooming and rotation capabilities
- High-fidelity 3-D synthetic environments of any resolution available
- Mathematical algorithms and data processing are both integral to the visualization system
- Missions may include travel in the air, on the ground or at sea.
- Realistic skies that include clouds, sunlight and shadows cast as needed
- Unlimited distribution without condition

These features and objectives will support wide ranging applications in:

- Combat and training missions
- Flight simulations
- ISR applications
- Post-flight analysis
- Safe navigation of military aircraft and marine vessels through areas of hostility.
- Weapon system and satellite development and testing

Two Sample Screenshots Provided Below:

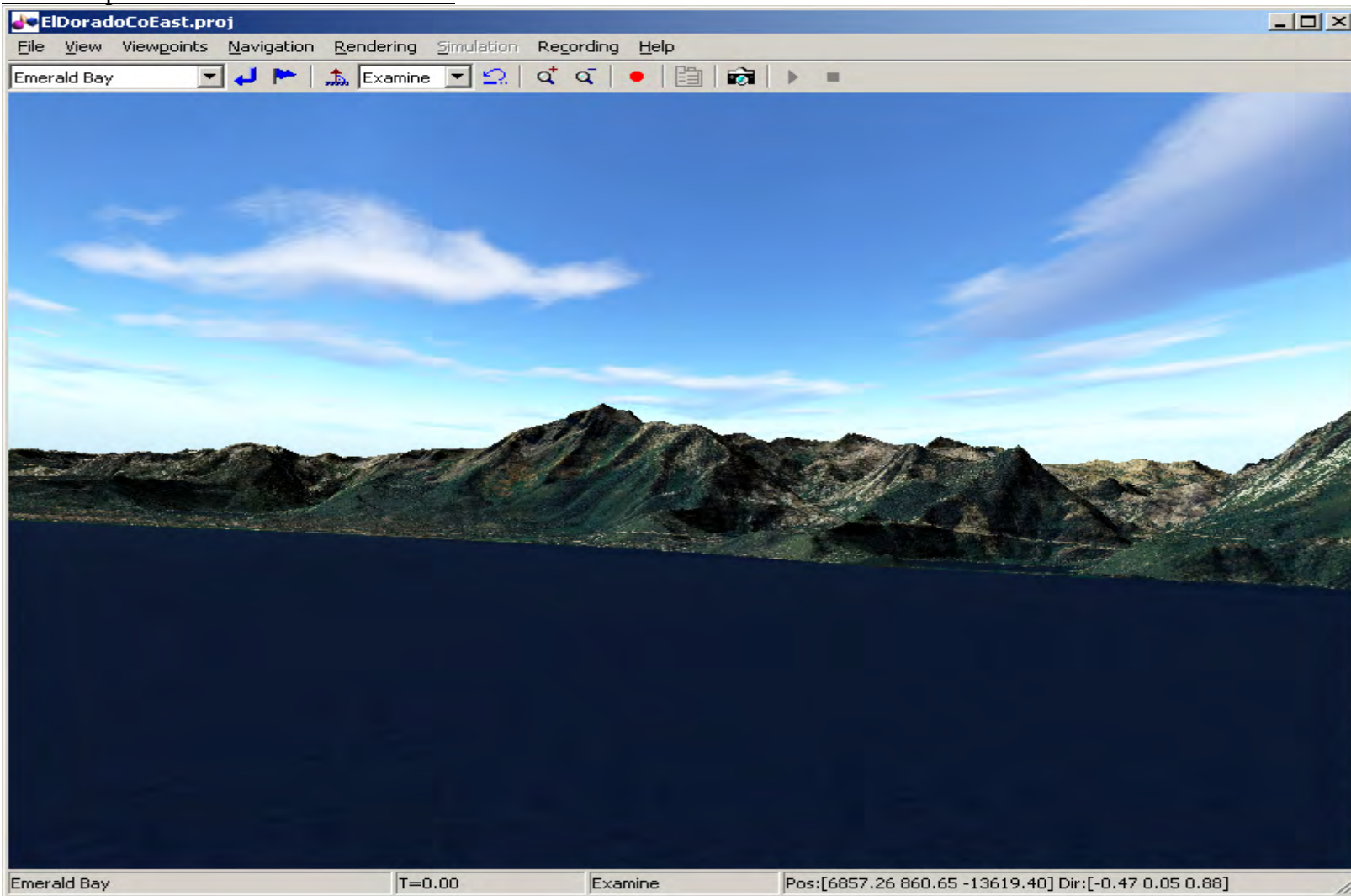


Figure 1: Screenshot of Lake Tahoe at low altitude

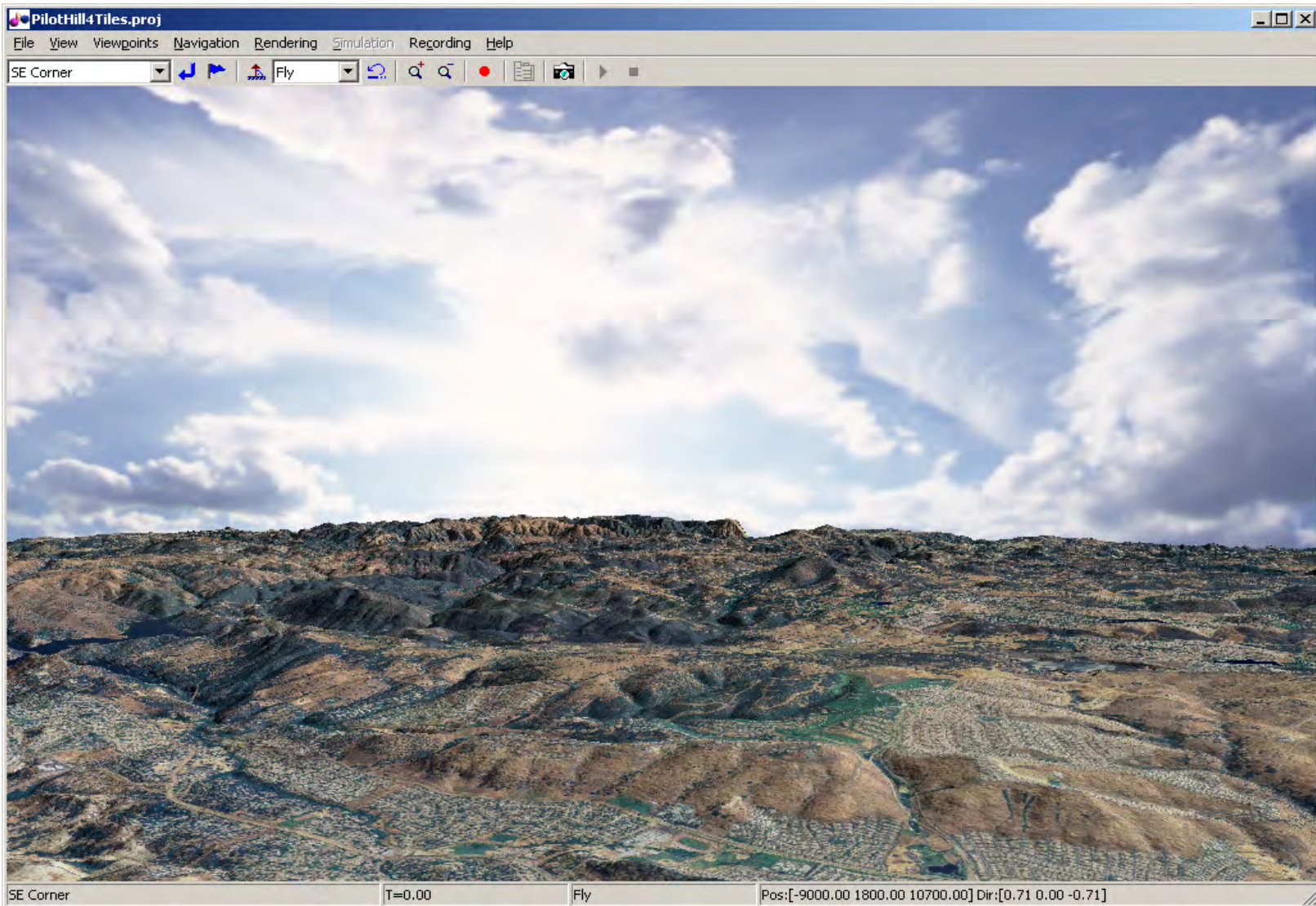


Figure 2: Screenshot of an area in central California

Edward J. Mayhew, Jr.
July 5, 2007