

Fact Sheet

SYNTHETIC PHYSICS-BASED EM SCENE GENERATION

PROBLEM

Terrain, vegetation, and weather effects present a complex, highly variable background for IR and MMW target seekers and IR viewers. This is especially true in the presence of snow and frozen ground. Captive flight tests are expensive and can account for only a limited range of conditions. DoD requires cost-effective methods for incorporating the complexities of the battlefield environment into training, planning, and weapon system development.

SOLUTION

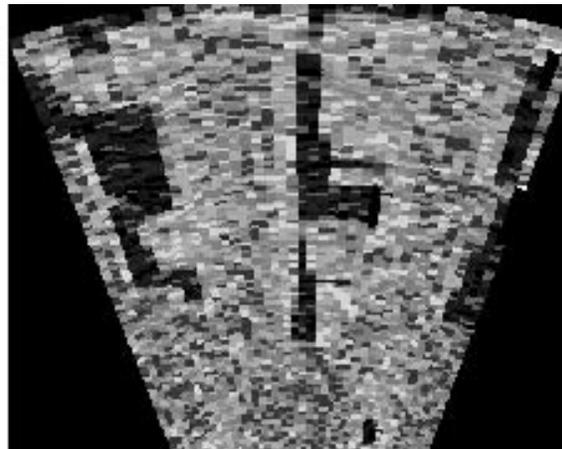
A validated capability for synthetic scene generation provides system developers with tools to reduce the number of field tests; selectively choose conditions of remaining tests; and to fully stress systems over a broader range of environmental conditions than is possible through field testing alone. This same capability will enhance training through simulation, and increase the fidelity of battlefield combat models.

STATUS

Corps of Engineers researchers have integrated field testing, physics-based modeling, and image rendering techniques to generate IR and MMW synthetic scenes. Through the Smart Weapons Operability Enhancement Program (SWOE), a terabyte of IR and MMW validation images that span both winter and summer conditions have been assembled. An IR scene generation capability has been implemented and validated through the OSD Joint Test and Evaluation Program. Physics-based MMW models of snow and soil processes have been coupled and distributed over test areas at high spatial and temporal resolutions. Predicted signatures have been rendered into scenes, which are comparable to measurements from captive flight tests. These maturing technologies can support training, planning, and weapon system development at a variety of levels. Applications include building all-weather databases for DIS applications; selecting conditions for live training; and constructing look-up tables of smart weapons performance under winter conditions.



IR scene



MMW scene

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