



James Mason

Testing and Modeling Capabilities

Brief introduction to our capabilities.

Systems Concepts and Integration (SCI) Panel
SCI-179/RTG-044 on Utilization/Dynamic Control of
Adaptive Camouflage Materials

14 February 2006 – 17 February 2006

TARDEC
U.S. ARMY TRAILHEAD ADVANCED RESEARCH DEVELOPMENT AND ENGINEERING CENTER

SUPERIOR TECHNOLOGY FOR A SUPERIOR ARMY



Overview

SUPERIOR TECHNOLOGY FOR A SUPERIOR ARMY

- Modeling Capabilities
 - Visual: CAMEO-SIM
 - Thermal: MuSES
- Data Collection capabilities
 - Sensors
- Test capabilities
 - Panels

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CAMEO-SIM Capabilities

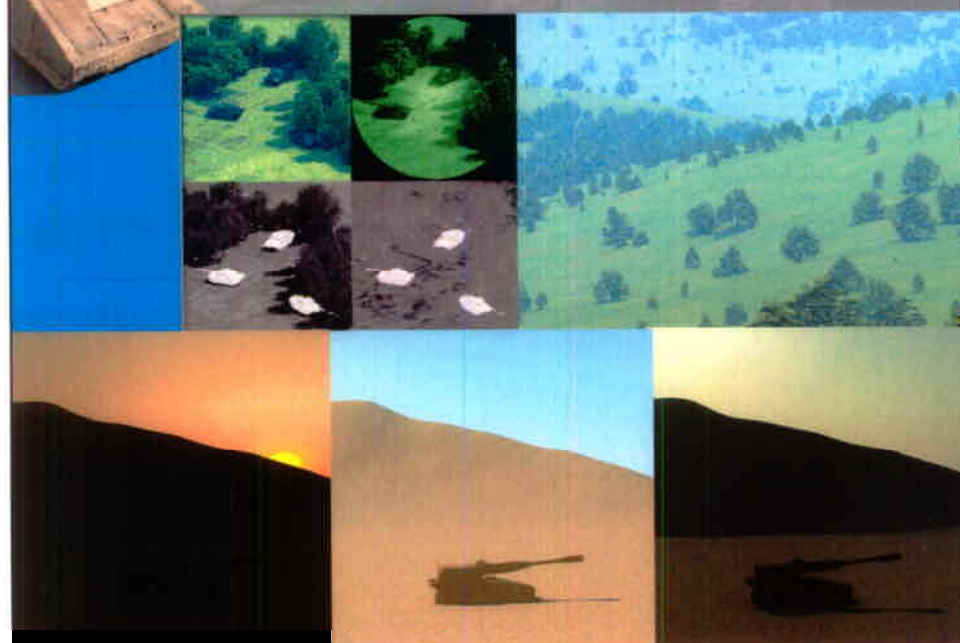
SUPERIOR TECHNOLOGY FOR A SUPERIOR ARMY

- Predictive software
- Creates and renders physics based synthetic scenes
 - High fidelity spectral imagery
 - Optimized for high polygon scenes and parallel processing
- Has been developed specifically for military applications
- Renders thermal reflections and thermal shadows
 - However, limited thermal prediction capability
- Bi-directional reflectance (BRDF) and directional emittance
- Spectral reflectivity, refractivity, absorptivity, and transmissivity

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CAMEO-SIM Screenshots



Thermal Modeling with MuSES

SUPERIOR TECHNOLOGY FOR A SUPERIOR ARMY

Model Build

- MuSES-CAD interface
- Mesh file import
- GUI-based model editing

Rendering

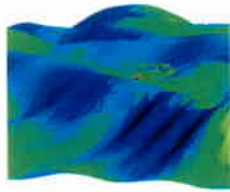
- Infinite multi-bounce reflections with BRDF
- User-supplied multi-lobed and anisotropic BRDF
- MODTRAN structured sky
- Exhaust plume radiance
- Sensor model



CAD Geometry



Thermal Model



IR Rendering

Thermal Analysis

- Conduction, convection, & radiation
- Internal heat sources
- Pre-computed CFD convection
- Weather effects

Terrain Model

- Physics-based model
- Complete Tgt-Bkg Interactions
- Weather effects
- Structured sea model with ship wakes

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Sensors

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Wavelength	Manufacture	Model
IR	FLIR	S40
IR	Indigo /FLIR	Merlin® Mid InSb
Visual	Nikon	D1X

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