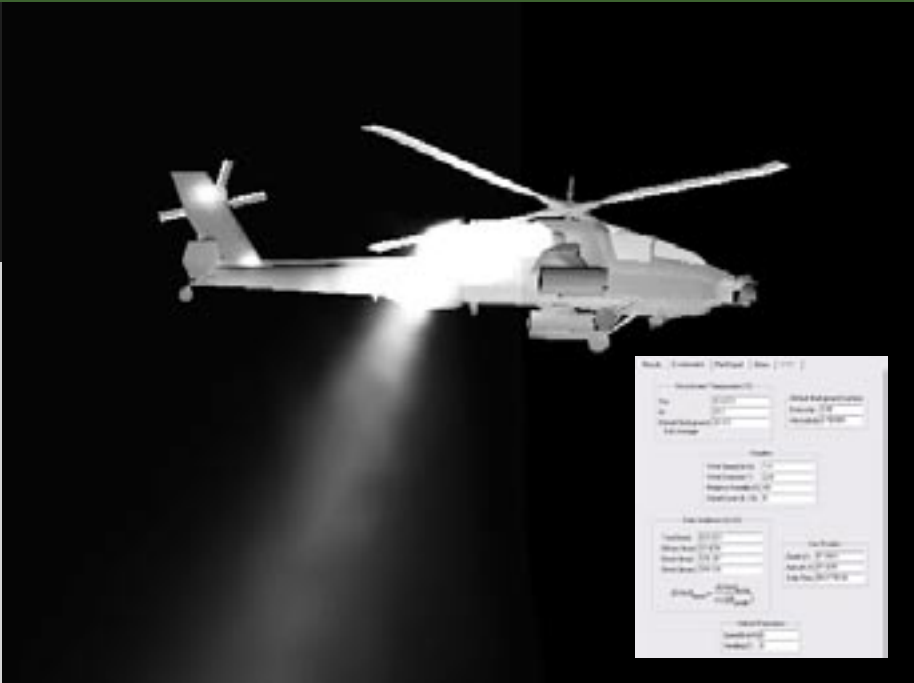




MuSES[®] 9.0

IR Signature Prediction Software



Principal Features

Complete Thermal Analysis

- Multi-bounce Radiation
- Solid Conduction (steady state)
- Planar Conduction
- Convection
- 1-D Advection
- Natural Environments

Infrared Signature Prediction

- Sky and Terrain Reflection
- BRDF Rendering
- Spectral Paint Surfaces
- Faceted Backgrounds

Multiband Prediction

- Apparent Temperature
- Radiosity

Target Backgrounds

- Various Terrain
- Various Foilage
- Layered Surfaces

Benefits

- Faster Product Development
- Heat Transfer & Infrared Solutions
- Interfaced to Scene Simulators

Testimonial

"MuSES has consistently predicted accurate radiance for targets ranging from desert plateaus to the north Atlantic."

–Senior Research Engineer

Common Applications

- Survivability / Hit Avoidance
- LO Design Analysis
- Signature Optimization

The Leader in IR Signature

MuSES (Multi-Service Electro-optic Signature) is an advanced thermal and infrared signature prediction program from ThermoAnalytics. MuSES will let the infrared analyst or specialist perform complete thermal modeling and infrared signature prediction within an integrated easy-to-use interface.

MuSES's highly-optimized algorithms handle even the most complex IR questions. Written entirely in C++, MuSES maintains speed and cross-platform compatibility across Windows, Linux, HP, SGI, and Sun computers. A state-of-the-art voxel-based ray tracer is used to compute view factors, solar projected (apparent) areas, radiosity, and apparent temperature. This ray tracer provides the fastest thermal and infrared solver on the market.

Natural environments are supported through weather data files and solar loading based on global position. MuSES can also use atmospheric data from MODTRAN. Multi-bounce solar radiation is automatically calculated including greenhouse effects from solar radiation transmitted through glass. Faceted terrains provide full target-background interactions, including reflections and shadowing.



ThermoAnalytics[®]

MuSES® 9.0

IR Signature Prediction Software



Version 9.0 Features

Face to Face Conduction

Simulates part to part contact
Reduces meshing time
Support for contact resistance

Aerothermal Heating

Blunt and Round Nose
Wing Leading Edge

Solid Conduction (steady state)

Support for solid 3D conduction
Solid solution coupled with full conjugate heat transfer analysis
Clipping plane display of internal temp.

Human Comfort Module Available

Supports integration of biothermally accurate human models. Licensed separately.
Steady state and transient thermal response
Output included thermal comfort index
Hyperspectral Rendering Module
Outputs a hypercube of narrow-band renderings

Air Targets

Altitude-specific weather
MODTRAN path attenuation
Custom atmospheric profiles

Complex Multilayer Parts

Planar mesh objects with up to 20 layers
Solid, air, or vacuum layers
Mixed solid/air layers

Parallel Processing

Shared memory licensing
2 CPU Speedup Average 1.8
4 CPU Speedup Average 3.3

Total Thermal Solutions

Predict Signature Data – The Infrared Signature post-processor displays physical temperatures, in-band radiances, and apparent temperatures for every element or facet. Running the BRDF solver allows the user to predict target and background specular radiance images into a pixelized format.

Improve Your Design – Import your surface geometry and change designs with ease. Manipulate the geometry within MuSES to improve heat management and understand IR signatures relative to a time-varying environment or operating conditions.

Utilize Faceted First Principle Backgrounds – To predict accurate target/background contrast levels, MuSES fully supports faceted backgrounds. Create or import a faceted terrain. Apply one or multiple background types to your geometry. Calculate accurate temperature/signature solutions—including full target background interactions.

Integrate with CFD – Seamless integration with CFD results (including FLUENT and STAR-CD) allows increased accuracy for convection.

Integrated Plume Module Available – Incorporate plume radiance into your BRDF renderings for total signature analysis. Licensed separately.

