

X-IG[®] Image Generator System

CATI image generator systems are the ideal choice for the visualization of simulation training systems. For over twenty years, CATI has been providing unparalleled rendering performance through advanced software algorithms and optimizations.

CATI's X-IG[®] image generator is a Commercial Off-the-Shelf (COTS) product for PC-based visual simulations. X-IG[®] is specifically designed around industry standard OpenGL[®], a high performance graphics Application Programming Interface (API), and OpenFlight, the 3D standard format for the visual simulation industry.

X-IG[®] is designed to render real-time Out-the-Window (OTW) and sensor scenes for training and simulation, creating real-world high resolution photorealistic visual and sensor scenes. X-IG[®] includes complete physics-based modeling for atmospheric, NVG, DTV, and IR simulations. X-IG[®] additionally includes special effects which complement the image generator enhancing scenes.

Currently in use with various military, civilian, and commercial customers, X-IG[®] provides high-fidelity visualization for flight simulators and a variety of other training systems. Advanced data compression, optimization, and paging algorithms allow X-IG[®] to render high-density, geo-specific databases of unlimited coverage.



**Bringing Reality to the
Virtual World...**



Real-Time Rendering Engine

- Renderings of 400,000 fully-textured, shaded and anti-aliased polygons per channel, peak performance of over 3.5 million polygons at 60 Hz
- Renderings of 100,000 light points in day/night/dusk at 60 Hz
- Synchronized multi-channel capability using hardware Genlock solutions
- Auto-alignment and channel edge blending for continuous multi-window applications without performance penalty
- Database paging and texture compression for uninterrupted training through high resolution geo-specific databases
- Full scene anti-aliasing for superior artifact control
- Anisotropic texture filtering increasing texture resolution
- Multiple light sources (ambient light, spotlights, steerable search lights, landing lights, etc.)
- Dynamic scene management
- FOV based dynamic LOD control
- Real-time texture animation
- Unlimited levels of occulting
- Integrated VT MAK DI-Guy real-time human simulation

Special Effects

- Highly realistic tactical and cultural effects with animations
- Emissive and reflective surfaces
- Multi-layer order independent transparency
- Dynamic shadow rendering of scene entities
- Effect, color, and size characteristics are correlated to associated database material
- GUI-based special effects composer
- Advanced dust model for Degraded Visual Environment training

SAF

- Multiple SAF support with fully correlated visual and SAF databases

Standard Interfaces

- Distributed Interactive Simulation (DIS)
- High-Level Architecture (HLA)
- Common Image Generator Interface (CIGI)

Sensor Modeling

- IR-TV payload sensor views
- Sensor fusion, LLTV and IR
- ROC-V modeling with controllable IR hotspots
- Multiple electronic/digital zoom and focus
- Tunable device specific IR effects: noise, brightness, gain, AC coupling, polarity, auto/manual gain, and level focus
- NVG simulation night imagery viewable with the unaided eye
- Contrast-based Image Auto-Tracker (IAT)
- LLTV camera model

Atmospheric and Weather Effects

- Comprehensive weather and atmospheric effects
- Multiple lightning and volumetric thunderstorm models
- Directional and dynamic snow/rain models
- Volumetric clouds, fog, and haze layer models
- Continuous and static time of day
- Ephemeris models

Mission Functions

- Tactical terrain server processes over 100,000 concurrent requests per second
- Surface material code feedback to host for ice, snow, rain, etc.
- 100,000 height of terrain calculations per second
- 11,000 collision detection calculations per second
- 20,000 laser range calculations per second

Application Programming Interface

- API portable source available
- After Action Review (AAR) record/replay capability
- Scripting engine

Databases

- Extensive libraries of world-wide, geo-specific, high resolution databases
- Rapid placement of database features using the Environmental Modeling Editor (EME®) for fast turnaround and reduced cost
- Stenciling of airfields
- Real-time tessellation
- OpenFlight, CDB, SECore compliant