

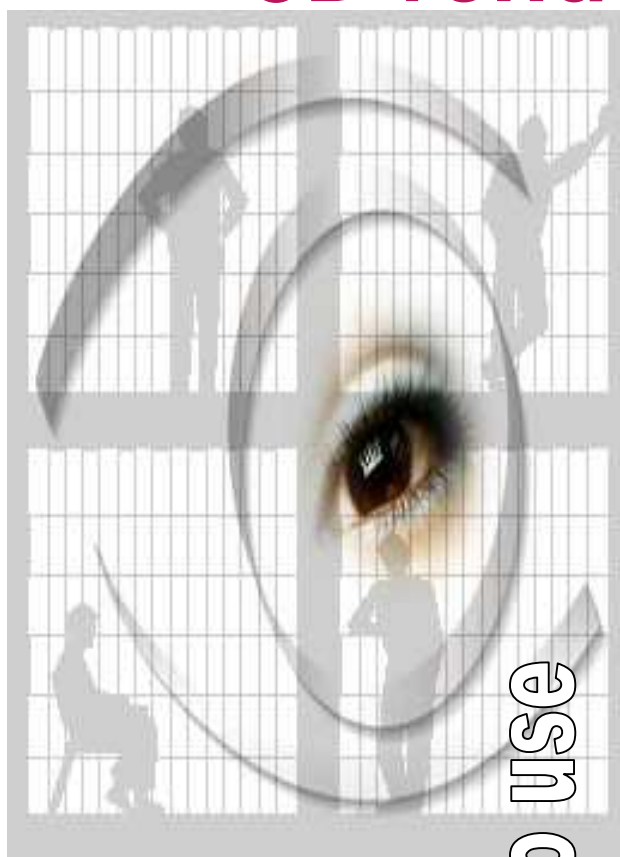
SE-FAST-IG

Real-time Image Generator 3D rendering

OTW

IR

NVG



Ready to use

Connect your simulator with a high performance visual application

FAST SCENE GENERATION SOFTWARE

SE-FAST-IG features:

- Out The Window image generation
- Physics-based InfraRed and Night Vision Goggles sensor simulation
- CIGI host interface
- 60Hz update rate
- Multiple channels synchronization
- Large area terrain paging
- Moving entity management
- Highly realistic environment and weather effects
- Light lobes and light systems for night scenes
- Mission functions
- Special effects

SE-FAST-IG is a high performance visualisation application. Meant to be driven by users' simulators through its CIGI interface, SE-FAST-IG supports the typical features required for image generators used in flight training, driving simulations, ground warfare and synthetic environment applications.

Application

SE-FAST-IG is an executable-ready render engine that requires no additional programming to operate, resulting in maximum productivity gains. A plugin interface is also available to supplement the image generator with features not available in core SE-FAST-IG and compile in users' specific features.

SE-Workbench

SE-FAST-IG is a component of SE-Workbench. It is built on top of:

- SE-FAST library that takes advantage of vertex and pixel shaders for Out The Window (OTW) image generation.
- SE-FAST-IR library that performs physics-based multi-spectral Electro-Optics (EO) sensor simulation
- SE-IR-SENSOR library for rendering advanced sensor post-processing effects

SE-FAST-IG is compatible with databases (including thermal and atmospheric data) created by SE-Workbench tools.



Channel configuration

- Designed for 60 Hz update rate or higher with more than 750 000 triangles and 1000 light points per channel
- Video formats up to 2048 x 1536
- 32 bit color and 24 bit depth buffer
- 16x sub-sample anti-aliasing
- 16x anisotropic texture filtering
- Frame synchronization of multiple visual channels
- Heads-Up Display (HUD) and 2D overlays integration

Databases

Typical databases rendered by SE-FAST-IG are :

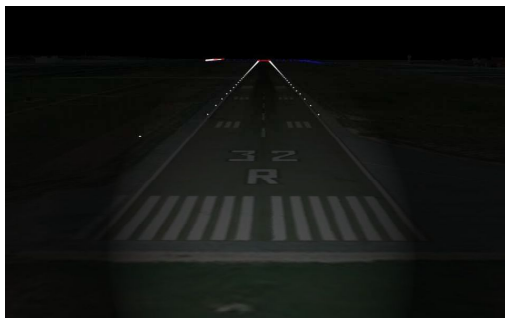
- Well-targeted area high detail databases
- Large area geo-typical databases with any number of high detail insets
- Large area geo-specific databases with any number of high detail insets and phototexture resolution to ½ meter per texel coming from aerial or satellite imagery



Terrain rendering can benefit from the following features:

- Coordinate system agility supporting both flat-earth and round-earth models
- Real-time paging of terrain, texture, and cultural features
- Management of different selectable variants, e.g., different damage states, activations of cultural lights, seasons
- Light system management for realistic night airfield scenes
- Faded non-distracting Levels Of Detail (LOD)
- Detail texture at low altitude
- Animated water surface based on wind
- Real-time reflection on water surfaces





Mission functions

- Height Above Terrain
- Height Of Terrain
- Line Of Sight
- Point-to-point intervisibility



Moving Entities

- Positional data extrapolation
- Constraints to follow the ground elevation or both the elevation and slope of the ground surface
- Light lobes for multiple landing lights and steerable search lights
- Animation of articulated parts such as airport wind sock, wind generators, rotors, landing gear, control surfaces, turret or rotating radar antennas
- Selection of appearance states among variants such as ones differing in damage states, lighting configuration, painting, camouflage
- Binding of special effects (such as smoke, fire contrail or dust trail) and entities to other entities
- Control of 3D human characters

Sensor Simulation

- Physics-based, 32 bits floating point, texel level calculations
- Low-Light TV, Night Vision Goggles, Near to Long-Wavelength InfraRed and multi-wavebands sensor simulation
- Advanced sensor effects such as optical, spatial and electronic Modulation Transfer Functions, non-linear detector model, fixed pattern noise, temporal additive and multiplicative noises, halos
- Automatic and manual gain control, polarity, coloring



Environment Effects

- Continuous time of day with ephemeris-controlled Sun and Moon
- Physics-based sky model with dawn and dusk horizon glow
- Real-time sun-cast shadows

Special Effects

- Vapor trails
- Fire and wind-driven smoke
- Explosion
- Rotor wash for ownship and other helicopters

Weather Effects

- Cloud layers, including volumetric clouds, with coverage from overcast to few scattered clouds
- Ground fog and haze
- Precipitation : rain and snow
- Per-pixel rendering of accumulated snow depending on the local slope of the receiving surfaces
- Lightning strikes



They chose SE-FAST-IG for their projects and training programs:



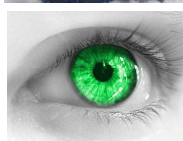
2006-2014 -French MoD (Centre d'Essais en Vol)
Enhancement of all weather TIGER helicopter flight capacities through the use of embedded sensors - Channels: 4 OTW + 4 NVG + 2 FLIR



2007-2010 - Eurocopter
Assessment of sensor benefit for the NH90 helicopter flight domain extension in very bad weather conditions - Channels: 2 FLIR/NVG



2008-2009 - Airbus
Assessment of Enhanced Vision Systems (EVS) benefit at landing and taxiing in all weather conditions, for the definition of the New Generation Cockpit - Channels: 3 OTW + 1 FLIR



2008-2011 - Vision Institute
For people suffering from Age-Related Macular Degeneration, training to new vision and mobility electro-optic aid systems - Channels: 3 OTW



2009-2010 - Onera & French Police Authorities
Performance assessment of aerial platforms (aircraft, UAV, rotorcraft) for security missions - Channels: 1 OTW + 1 FLIR



2010-2011 - Dassault Aviation
Assessment of Enhanced Vision Systems (EVS) benefit at landing and taxiing in all weather conditions, for the definition of the Falcon cockpit - Channels: 2 OTW + 2 FLIR



2010-2013 - French Government
Study of new concepts of cockpits in the future
Channels: 5 x (3 OTW + 1 FLIR)

Benefits:

- Ready to use application
- Consistent OTW, IR and NVG simulation
- Performance

Customised service packages available

System requirements :

Windows™ XP and 7

GPU requirements :

NVIDIA GeForce™ 500 Series or higher
NVIDIA Quadro™ for multi-channel synchronization