



Virtual Reality Scene Generator™ (VRSG™)

MetaVR® Virtual Reality Scene Generator™ (VRSG™) is a Microsoft DirectX 11-based render engine that provides geospecific simulation as an image generator (IG) with game quality graphics. MetaVR's IG enables users to visualize geographically expansive and detailed virtual worlds on commercially available 64-bit Windows PCs. Since 1997, VRSG has provided real-time, single- or multiple-channel visualization of virtual environments, dynamic moving models, and special effects. You can use VRSG as a:

- *Dedicated computer image generator* coupled to an external simulation host in single or synchronized multi-channel mode. VRSG supports features often required for flight training, driving simulations, and other applications.
- *DIS stealth visualization tool* for real-time or after-action analysis of distributed simulation exercises.
- *Self-contained first person shooter* to simulate individual combatants, JTACs, or forward air controllers.
- *Self-contained UAS camera payload operator* to render HD simulated UAS payload video and to stimulate video players such as a ROVER.

Using advanced terrain and texture paging algorithms VRSG renders geospecific imagery over expansive round-earth 3D terrain while providing full-scene anti-aliasing and continuous level-of-detail morphing. VRSG is delivered with robust libraries of 3D models and high-resolution terrain of the U.S. and most of the world.

As an executable-ready render engine, VRSG supports but does not require programming. Configuration files and interface protocols provide users the ability to control basic components of the render engine. Developers can use the plugin interface to augment VRSG's functionality with their own low-level features.

VRSG is a component of MetaVR's rapid virtual world terrain creation and visualization technologies. When you choose VRSG for your IG, your program benefits from the security of a large installed base of diverse types of fielded systems.

Image generator features

Asynchronous texture paging technology for visualizing high-resolution, photo-realistic databases at 60 Hz.

Database geometry paging, level-of-detail blending, decoupled terrain and texture level-of-detail.

Ephemeris model for sun and moon position, moon phase, and star position.

Dynamic lighting and time-of-day conditions, light-point based star fields, horizon glow, and multiple sky models.

Multi-texture techniques such as normal maps, shadow maps, light maps, and decals.

Volumetric clouds and storm cells with optional volumetric precipitation effects.

Shadows cast by dynamic moving models and culture, and clouds onto terrain and 3D ocean bodies. Object-on-object dynamic shadowing (available in forthcoming VRSG 6.4 release).

Screen space ambient occlusion.

Multiple atmospheric layers including ground fog and haze with sun-angle dependent density and color.

Light points that respond realistically to visibility conditions.

Realistic light lobes that yield per-pixel radial attenuation and per-vertex axial attenuation.

Simulation of ocean sea states: realistic 3D wave motion and wake waves, accurate environment reflections, and bathymetry.

User-extensible particle effects that respond to wind: dust trails, contrails, tactical smoke, volumetric flames, and blown sand or snow. Other effects include dynamic craters, wakes, track and wheel impressions, and solid particle ballistic effects.

Utilities to convert FBX models and OpenFlight databases and models to MetaVR's model and round-earth terrain formats.

Full mission function support to include height above terrain, laser range, line-of-sight (intervisibility), and collision detection.

Native support for DIS.

Significant Common Image Generator Interface (CIGI) support.

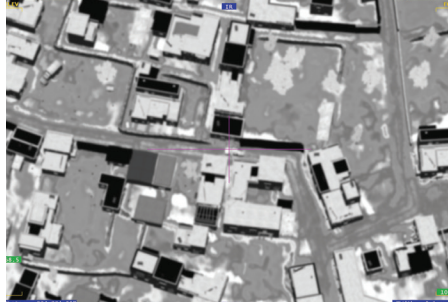
Native high-performance 3D human character render engine; no third-party software required. Capable of managing thousands of character entities and displaying hundreds in the field-of-view.

Support for synchronized multiple channels and multiple viewports per channel.

Edge blending and distortion correction support of third-party solutions from Scalable Display Technologies and VIOSO.



VRSG real-time rendering of an F-5N VFC-13.06 entity model in flight over MetaVR's terrain of Yuma Proving Ground, AZ. Terrain was built from 2 cm per-pixel resolution imagery captured by MetaVR's SUAS.



VRSG Scenario Editor

In-game drag-and-drop interface for adding and manipulating static culture to build up areas of interest on the terrain, and to script pattern-of-life scenarios intended to be played in VRSG.

Sensor simulation

Physics-based infrared simulation featuring on-the-fly classification of geoscientific visual spectrum imagery. Sensor simulation responds to environmental conditions and diurnal cycles. Includes a radiance-based automatic gain control, manual level/gain override, and noise as a function of dynamic range. Mid-range and far IR wavebands supported to model thermal imagers.

Post-processing effects include noise, blur, depth-of-field, level, gain, polarity, digital zoom, heat refraction, and AC banding.

Electro-Optic (EO) and Night Vision Goggle (NVG) stimulation modes.

Radar simulation to support applications such as F-16 DRLMS, SAR, and ISAR.

3D content libraries

Over 7,400 culture and dynamic models, and geospecific round-earth 3D terrain of most of the world in 15 meter or better resolution with higher resolution insets of areas of interest. (CONUS++ terrain at one meter or better resolution with over 35 geographically accurate modeled airports and MOUT sites.)

Over 3,100 military vehicle and munition models, with ongoing entity additions in support of Combat Air Force Distributed Mission Operations (CAF DMO) requirements. Target recognition training supported using screen captures and videos of models placed in VRSG scenes.

Over 335 commercial vehicle models; 550 character and weapon models with over 1,450 BVH animations; 3,650 culture models of buildings and other structures, foliage, signage, and street elements. Damage states are added to building models on an ongoing basis; currently 200 buildings have damage states.

Model Viewer to preview model switch states, damage states, articulated parts, and thermal hotspots.

UAS simulation

Support for the MUSE VIDD V2.4 for high-fidelity UAS training.

Built-in UAV sensor payload model allowing any DIS airborne platform to be used as a UAV, for situations when a notional UAS will suffice for your training needs.

Real-time HD H.264 video generation with embedded KLV metadata using STANAG 4096-compliant MISB ST 0601.8 KLV metadata and MISB security metadata standard 0104.5.

Ability to configure H.264 video streaming plugin as a Real Time Streaming Protocol (RTSP) server to feed streaming video to connected client machines.

Built-in 2D display overlays for several UAS platforms.

JTAC / FAC simulation

Laser rangefinder/designator mode for designating targets for other simulations.

NVG IR pointer mode for night-time target marking.

Stimulate ROVER devices with streaming HD digital video of UAS or targeting pod feeds.

Integration with simulated military equipment (SME) for laser ranging and target designation.

Support for off-the-shelf devices such as NVIS Ranger 47 virtual binoculars, and the HTC Vive and Oculus Rift HMDs.

Analysis / after-action review features

Mature user interface and feature set supporting real-time or after-action review functions.

Attachment modes: tether, mimic, orbit, compass, and track.

Fire lines and shot lines for visualization of engagements.

Savable viewpoints, entity-relative or database-relative.

Visualization of designator PDUs.

Virtual world 3D sound capability.

For more information, contact sales@metavr.com or scan the QR code to your mobile device.

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