Terrain Tools for Esri ArcGIS

MVRsimulation™ Terrain Tools for Esri® ArcGIS® for Desktop enables users to turn their geospatial data into real-time 3D terrain from within their GIS software. Building on the industry standard ArcGIS platform, the Terrain Tools extension combines powerful 3D terrain creation with an accessible interface that can be easily understood by anyone with a comprehension of geo-spatial data concepts and some experience with ArcGIS.

Core features

In addition to creating real-time terrain in round-earth terrain format for rendering in MVRsimulation's Virtual Reality Scene Generator™ (VRSG™), the key features of MVRsimulation's Terrain Tools for ArcGIS include:

- Live compositing display of raster imagery and elevation data in a WYSIWYG interface.

- Support for any format of source data supported by ArcGIS.

- Raster display capabilities: pan-sharpening, custom band order, multiple re-sampling techniques, histogram stretching, contrast and brightness control, masking, and edge blending.

- Ability to supply vector data to define linear and areal features. Generate road networks, fine tune elevation with polygon or point data, create extruded buildings, walls and fences, create large coverage areas of cultural lights, or specify cut-in areas with blended geotypical ground textures.

- Forest tool for a quick and efficient way to distribute thousands of randomized and scaled tree points within a polygon.

- Support for compiling 64-bit terrain.

- Support for building underwater geometry (bathymetry) to increase the terrain fidelity of the ocean floor for use in littoral scenarios with VRSG's 3D ocean sea states.

- Ability to compile 3D and 2D external terrain geometry (such as inset models and runways) directly into the terrain for a seam-less integration between the terrain and cut-in model geometry.

- Distributed build system with a browser user interface. Optionally, use ArcGIS Engine for lower-cost headless build machines.

- Renders in VRSG with external 3D content built upstream as part of the art pipeline.

- Support for the Navy's Portable Source Initiative (N-PSI) standard for terrain database source data.

All features integrate seamlessly with the industry's leading GIS platform.

Within the ArcGIS interface, coastlines and road networks can be digitized and cut out from geospecific imagery using Terrain Tools. At runtime, VRSG generates simulated 3D oceans in the regions identified as water, and blends road textures with under-lying imagery. The terrain tiles seamlessly match complete water tiles generated by VRSG.
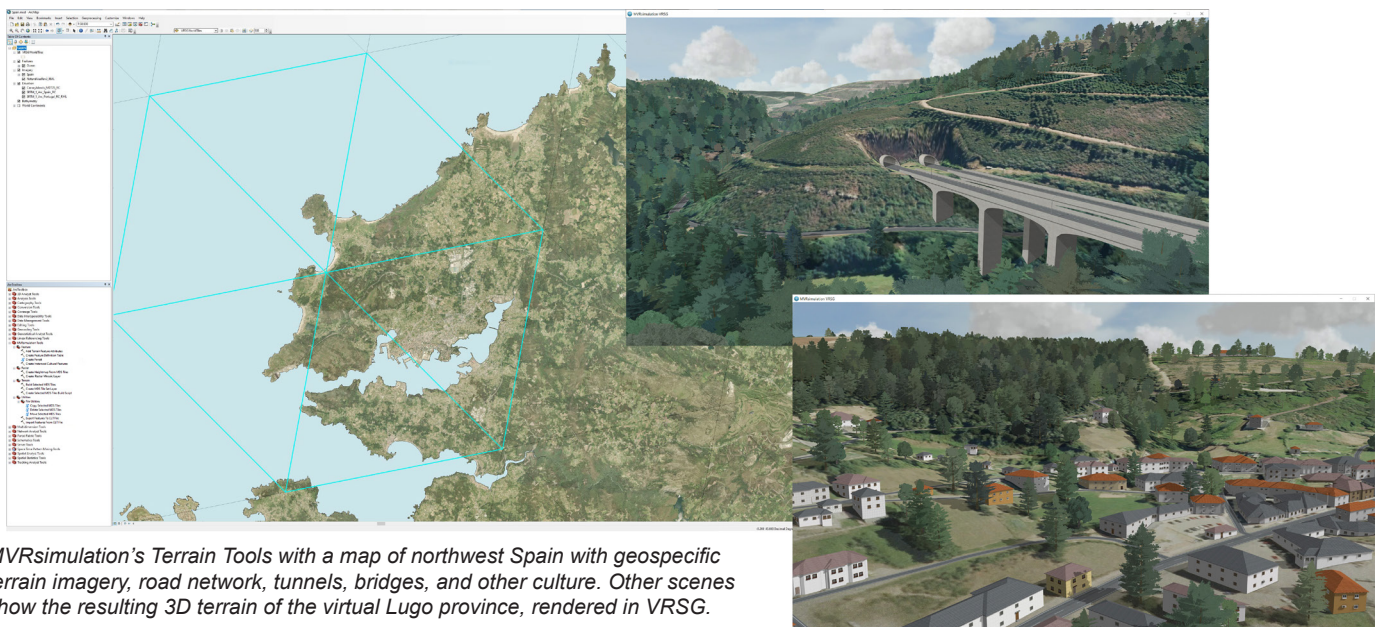
MVRsimulation's Terrain Tools with a map of northwest Spain with geospecific terrain imagery, road network, tunnels, bridges, and other culture. Other scenes show the resulting 3D terrain of the virtual Lugo province, rendered in VRSG.

Terrain Tools and VRSG real-time textured and wireframe 3D views of virtual Albacete Air Base,Spain. The control tower model is shown in Model Viewer. Geospecific air base models were built in Luxology Modo and Autodesk 3ds Max from publicly available photos and then geolocated on the terrain in Scenario Editor.

VRSG round-earth terrain

MVRsimulation's VRSG round-earth terrain format is ideal for aerial flight applications, which require vast areas of terrain. Terrain Tools is currently used to build terrain for many manned and unmanned aircraft simulators. The round-earth terrain format has many benefits; most importantly, the terrain models the earth's curvature to a high degree of accuracy over its entire surface in contrast to a local approximation that is only valid over a relatively small range. This level of accuracy is vital for targeting applications and determining intervisibility. For example, a credible JTAC simulation includes manned aircraft and UAVs, operating at distances and altitudes where earth curvature is a factor in accurate line-of-sight calculations. Close air support (CAS) simulations require very large areas at a very high altitude down to the ground level. Credible CAS mission simulations are not relegated to the bounding area of the training range.

Another critical advantage of the VRSG round-earth terrain format is its segmented database representation. Terrain built in VRSG format is comprised of relatively small, self-contained terrain tiles that fit together seamlessly but can be built separately. This property enables a high degree of parallel processing of terrain since many different machines licensed for ArcGIS and Terrain Tools can build tiles for a given area at the same time.

Creating scenarios on the terrain

Once terrain tiles have been built, they can be opened in MVRsimulation's Scenario Editor (installed with VRSG), where users can build up additional areas of culture and create pattern-of-life scenarios on the terrain to play back in VRSG.

New features

Terrain Tools version 1.6 includes:

• Ability to recompile an existing 3D terrain's cultural features without having to recompile the terrain and textures.

• Colorization of tree models and other vegetation by automatic color matching of the models with underlying geospecific imagery.

• Powerline and light lobe support for compiled-in instances via positioning attributes specified in a JSON file.

• New tool to create a raster image from compiled terrain for cases where a heightmap is needed.

• Improvement for rendering the transition between levels of detail.

All the advancements in the latest ArcGIS for Desktop version 10.6 are supported in Terrain Tools.

Prerequisites

MVRsimulation's Terrain Tools for Esri ArcGIS requires any license level of ArcGIS for Desktop or ArcGIS Engine version 10.4 and above (Basic, Standard, Advanced), and ArcGIS 3D Analyst extension.

Additional terrain-building machines can use either ArcGIS for Desktop or ArcGIS Engine version 10.4 and above. Note that at least one full license of ArcGIS for Desktop is required to run Terrain Tools. In addition, Terrain Tools must be installed on each machine on which terrain will be built.

For more information, visit www.mvrsimulation.com or contact sales@mvrsimulation.com.

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