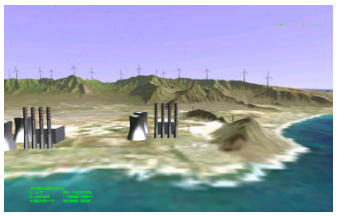
Advanced Terrain Suite

DT Visualizer

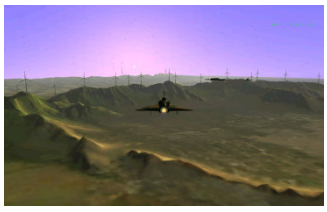
DT Visualizer is an interactive visualization application for 3-Dimensional Geospatial Terrain Databases. It is capable of visualizing extremely large terrain databases and provides various navigational controls including motion models like walk, fly and trackball. It also provides auto-pilot navigation for pre-computed paths and fly-throughs. The software uses an efficient rendering backend composed of smart algorithms and techniques like GPU-accelerated on-the-fly geometry generation, level-of-detail and visibility culling to get real-time frame rates on COTS graphics hardware.



DT Visualizer supports popular geometry file formats including 3DS Max (.3ds), OpenFlight (.flt) and ESRI Shape File (.shp). The tool includes features like object selection, GIS information display, toggling GIS layers and individual objects among others. The complete user interface is customizable using an XML file interface allowing each user to customize the controls based on his/her preferences. The display module is customizable to render on COTS desktop displays as well as scale to multi-channel Virtual Reality displays and various 3D Stereo modes.

FX Modules

DT Visualizer has a modular architecture that allows adding custom plugins using the FX interface. Darshan offers custom module development and integration services to complement the available set of tools.

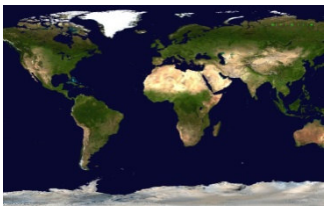


Currently, the following optional FX Modules are available for usage-specific features:

- **Flight Simulation** with features including 5.1 stereo audio, missile controls and effects like plumes, smoke trails and explosions, Fly Box support among others.
- **Environment Simulation** for different time-of-day conditions like day and night as well as weather conditions like rain, snow and fog.

DT Processor

DT Processor creates 3D terrain models from geospatial data. It accepts raster images and corresponding digital elevation models (DEMs) to create a unified 3D terrain model. It supports multiple layers of varying resolutions.



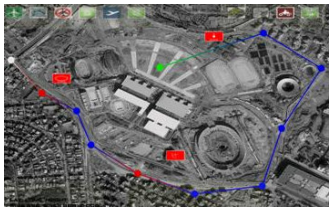
High resolution regions of interest (ROIs) can be inserted in the database on top of low resolution base layers.

DT Designer

DT Designer is an interactive application for creating 3D terrain databases and provides an intuitive user interface for the same. Various static objects, e.g. buildings, as well as dynamic objects, e.g. aircraft, can be added to the virtual scene. The tool can handle arbitrarily large terrain data sets and allows generating a human readable and editable XML file that can be loaded unmodified in DT Visualizer.

Planner Module

DT Designer supports placing military objects like tanks, radars and guns in the scene. The Planner Module can be loaded to perform automatic path planning based on user-specified start, end and intermediate points as well as geometric obstructions, e.g. buildings, and military obstructions, e.g. enemy radars. The module can efficiently compute paths for flight-simulation as well as ground-level navigation scenarios.



GIS Integration

All terrain tools integrate with popular Open Source GIS software like Grass GIS and PostGIS using plugins developed by Darshan. Users can control and launch DT Processor directly from Grass GIS. Terrain databases co-reside with GIS layers on a centralized database server using PostGIS and PostgreSQL combine and are pulled transparently by D tools using on-demand paging techniques.

The PostGIS plugin allows scaling the number of users by supporting multiple database servers and file servers. The use of sophisticated graphics hardware accelerated image compression and decompression techniques help reduce network traffic and bandwidth requirements. Level-of-detail rendering guarantees interactive frame rates even when running over low-bandwidth networks.

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