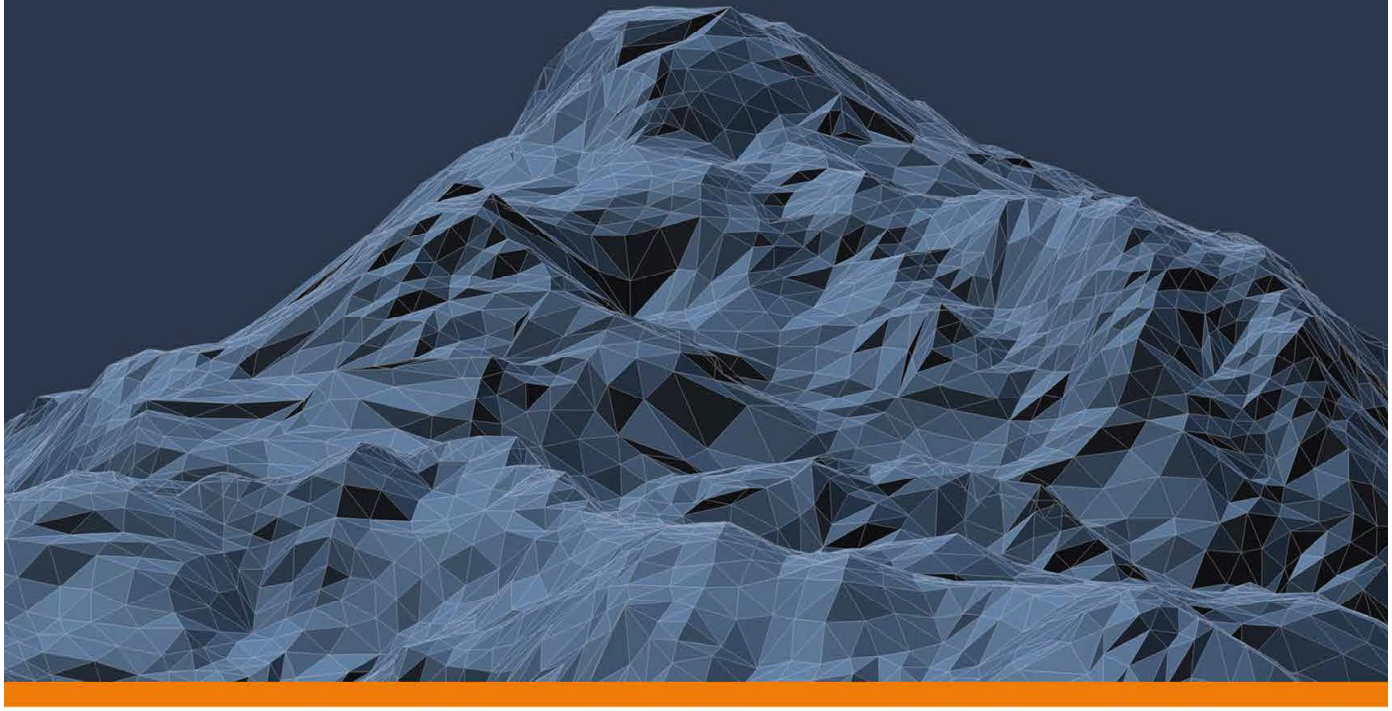
TRIAN 3D BUILDER

Database Generation System



BROCHURE

DATABASE GENERATION SYSTEM

THE NEW KIND OF DATABASE GENERATION

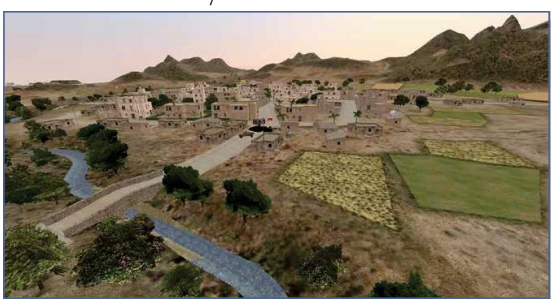
Trian3DBuilder offers comprehensive features required for the generation of geospecific correlated terrains optimized for real-time rendering. With its simple workflow and new concept use based on modular construction templates, Trian3DBuilder is the first next generation terrain-creating tool on today's simulation market. Flexible licensing options, with the choice for various feature/export upgrades, a short training period and an overall simplified tool chain can help cut costs in everyday production process.

KEY FEATURES

- → Ease of Use
- → Geospecific, Geotypical and Generic Databases
- → Complex Road Networks with OpenDrive Export
- → Buildings and Airports
- → Export to a Multitude of Industry Standard Formats
- → Free Multi-Core Support
- → Interactive 2D / 3D Editing

TERRAIN TYPES

Geospecific terrains are generally based on real-world data such as satellite imagery or vector source data. Geotypical and generic terrains are, in contrast, generated mathematically using landcover data or height/slope dependent texturing. The natural terrain structure is preserved and objects are placed automatically fitting the underlying texture. All approaches can be combined flexibly.



WORKFLOW

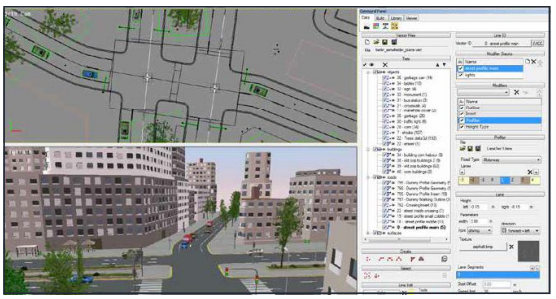
Trian3DBuilder's intuitive user interface has been designed by following a user-driven approach and not specifically made for highly specialized terrain engineers. Vector and elevation data can be verified, edited or created with a comprehensive set of tools. The data can be edited synchronously in 2D or in 3D by using the interactive WYSIWYG mode of the integrated 3D viewer which also offers full paging support.

GENERATION

The novel generation algorithms have been developed for high performance and offer a variety of features for rapidly designing and creating sophisticated large-scale terrains for flight-, driving-, maritime and infantry simulations. A wide range of import and export capabilities for all kinds of georeferenced data types and projections are offered. With the basic license, multi-core systems are used to full capacity.

The flexible combination of modular generation rules for vector features provides a convenient set of capabilities. Complex vector features can be cut into the ground mesh with smooth transition borders and rendered into the ground texture. Objects may be placed and generated due to various rules.

Unlimited terrain LODs with file structure management, automatic grouping of objects, various terrain simplification types and many other generation features provide fast terrain rendering and paging. Through specific generation settings for each terrain tile and the support of multi-tile grids, each project can be set up optimally to the scenario's demands.



GEOTYPIC GENERIC MODULE

BE INDEPENDENT FROM EXPENSIVE SOURCE DATA

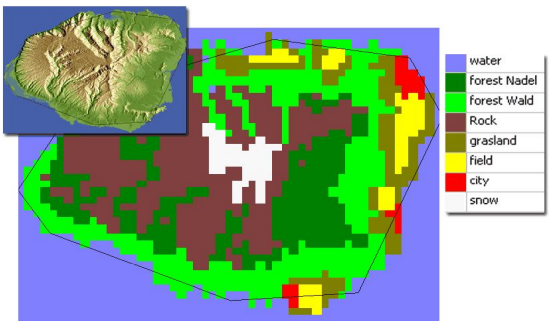
The Geotypic Module adds the capability to generate photorealistic terrains only on the basis of elevation and landcover data. Texture sets for various terrain types are combined to form a heterogeneous landscape. With the vector definition for each texture, the terrains may be densely populated with hand-modelled or generically generated objects. Thus, a completely featured terrain can be set up in minutes.

KEY FEATURES

- → Generic & Geotypic Texturing
- → Automatic Object Placement
- → Height/Slope Ramp Dependent Texturing
- → Independent from Expensive Satellite Images
- → Various Texture Sets Inclusive
- → Sensor Compatibility

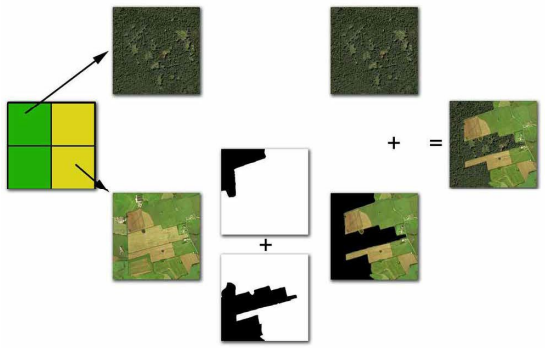
GEOTYPIC TEXTURING PROCEDURE

→ Height and land-class data

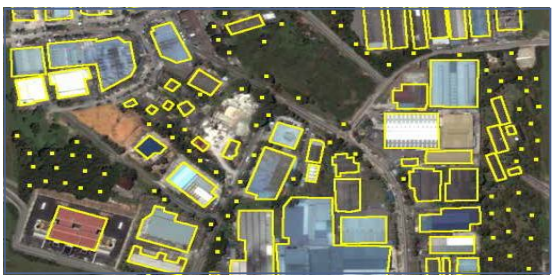


→ Various ground textures

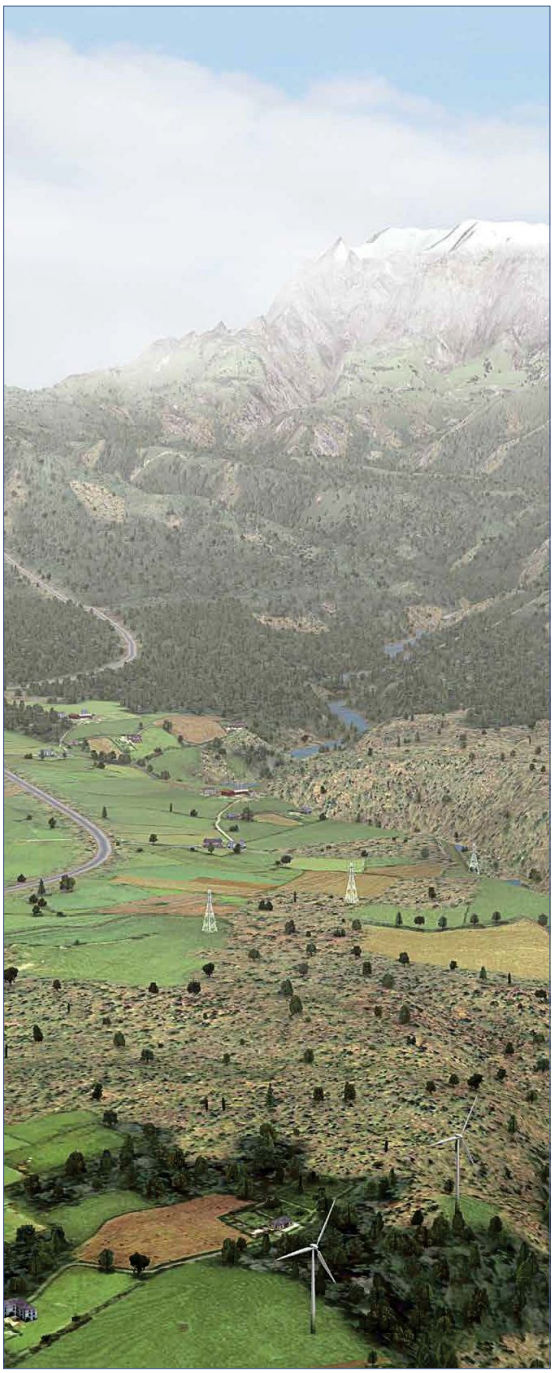
→ Texture transitions with alpha maps



→ Information about object placement



→ End result with preserved structure and object placement



ROADS AND ROADS PLUS MODULE

BUILD COMPLEX ROAD NETWORKS IN MINUTES

Trian3DBuilder's capabilities for fully-featured road networks of arbitrary size, applicable for driving simulations, are unique on the market.
Real-world navigation data is analyzed and parametrized automatically. The visual database is generated with additional AI information's for driving and traffic simulation.

KEY FEATURES

- → 3D Profiles, Lanes, Signals and Markings
- → Crossings from Arbitrary Roads Constellations
- → Huge Road Networks from Real-World Data
- → OpenDRIVE Export
- → Streetcar Support
- → Using Construction Rules (Arc/Clothoid Based)

ROADS GENERATION

Roads are generated from 3D profiles with arbitrary lane settings and lane count and are cut into the terrain mesh. Smooth transitions between different road settings are supported. Street generation templates are automatically assigned to the input data based on vector attributes. The data is preprocessed automatically and can also be edited by hand in 2D or 3D view. Road markings are created as well as generic bridges and tunnels.

REAL-WORLD DATA

Besides other standard formats, OpenStreetMap and navigation data may be imported and is automatically translated into road generation templates. Line data can be pre-processed and converted into an arc/clothoid-based representation, which corresponds to road construction rules. The project wizard helps set up a project without deep knowledge of the software.

INTERSECTIONS

Any line constellation is supported to form most complex crossings and various junction types. Forks and motorway exits are supported as well as smooth transitions between different lane settings of roads. Those features can be combined with tunnel and bridge generations.

RAILS FOR STREETCARS AND TRAINS

Rails are created with power lines and can be combined with roads.
Switches and waiting areas are supported.

OPENDRIVE EXPORT

OpenDRIVE is an open file format for the logical description of road networks. The Roads Plus Module contains an exporter, which exports all AI information related to the roads. This logical information includes traffic signs and lights, which are connected to roads and crossings and can be grouped

AUTOMATIC AIRPORT GENERATION

BUILD AIRPORTS IN NO TIME

The Airport Module enhances Trian3DBuilder with the quick generation of complex airports. Choose from a huge airport database from all over the world, adjust the settings and import to detailed editable vector data. The airport is integrated in a terrain of arbitrary size and can be exported to any standard format.

KEY FEATURES

- → Automatic Airport Generation
- → Over 20.000 Airports (Continuously Updated)
- → Fully Featured (Runways, Lighting, Taxiways)
- → Simple Modification of All Features
- → Integration into Surrounding Terrain
- → Library of Models (Control Towers, Aircrafts...)

WORKFLOW

With its very simple workflow Trian3DBuilder supports the generation of extensive airports in a matter of minutes.

- → Choose an airport
  by its ICAO code
- → Modify the attributes
  Like runway position, light settings or ground types.
- → Import the airport
- → The data is translated into vector data
  and the 3D model can be generated right away.

2D & 3D EDITING

The imported vector data can optionally be worked over with an extensive set of vector editing tools and may be enriched with other data (e.g. Open Street Map). The terrain can be validated and modified in the internal 3D viewer with direct visual feedback.

SUPPORTED AIRPORT FEATURES

- → Approach Lighting
  ALSF_I, ALSF_II, CALVERT, CALVERT_ILS, SSALR, SSALF, SALS, MALSR, MALSF, MALS, ODALS, RAIL
- → Additional Lighting
  Edge, Touchdown Zone, and Center Lights
- → Runway Light Indicator
  PAPI, VASI, Left, Right
- → Runway Marking
  Threshold, Identifier, Touchdown Zone, Center/Edge Lines
  Displaced Threshold and Stopway
- → Taxiways
  Lights, Signs, Center/Stop Lines
- → Special Areas
  Apron Areas, Helipads with Markings
- → Placement of Special Objects
  Tower, Wind Sock, Light Beacon

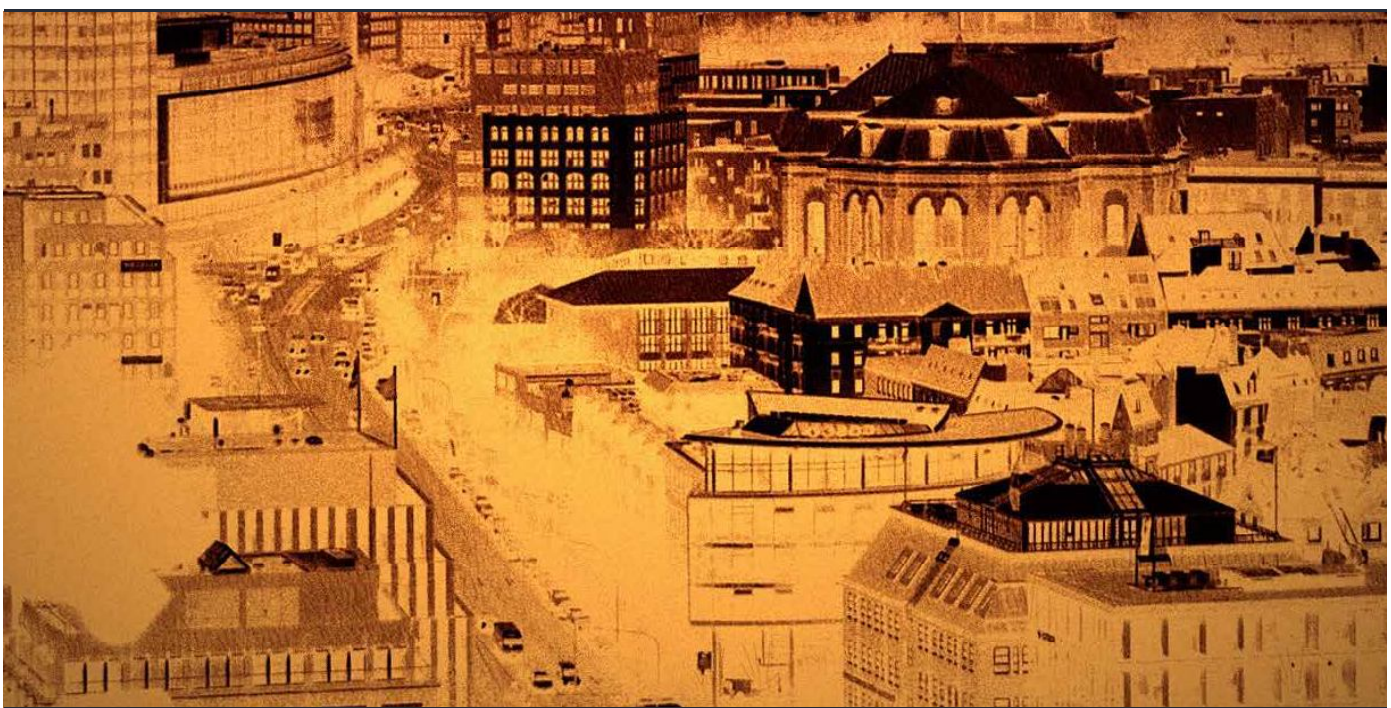
SENSOR DATABASES

SENSOR ATTRIBUTES FOR YOUR SIMULATION SYSTEM

The Sensor Module supports the generation of additional textures and surface descriptions, including information about the physical classification of terrain and objects. Using that information, the visualization software can calculate arbitrary sensor views depending on physical attributes and requirements: night vision, thermal imaging, radar, etc.

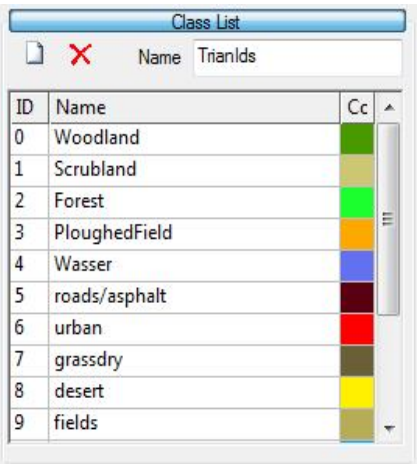
KEY FEATURES

- → Simple Definition and Assignment of Properties
- → Assignment to Texture Pixel or Mesh Faces
- → Flexible and Quick Parametrization Through Ids
- → Supports Any Sensor Application
- → Compatible with Geotypical & Generic Texturing
- → Preview Coloured Results in 3D View



MATERIAL PROPERTIES

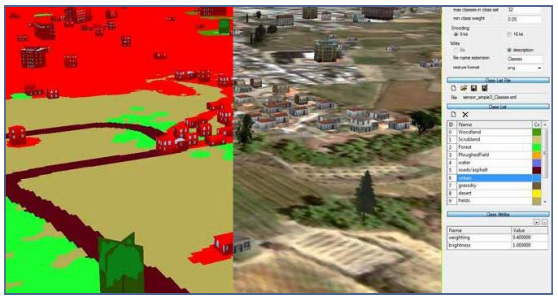
The Sensor Module allows the user to add physical attributes to each pixel of a database. The allocation is realized with additional texture layers. The application automatically assigns an arbitrary count of classes holding weights for various material types (e.g. 30% Sand and 70% Asphalt). For performance reasons, negligible percentages can be filtered out.



SENSOR CLASSES

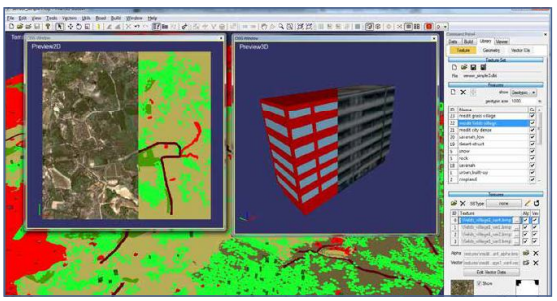
The attribute sets are arranged in classes (IDs). With the simple GUI physical properties can be defined quickly and easily. For the ease of editing and verification, colours can be assigned to the texture classes.

Using those colours the landscape can directly be verified in Trian3DBuilder's internal 3D view.



COMPATIBILITY

To ensure compatibility with any image generator, the attribute set can be saved in the comment field of the terrain's scene graph or optionally in a separate XML file. Various settings like texture format and channel encoding can be adjusted to any IG's requirements.



NIGHT VISION, INFRA-RED OR CUSTOM SENSOR

The Sensor Module helps to enhance a terrain database optimally for sensor simulation in any simulation system for e.g. night vision or infrared visualization. Prefabricated sensor textures for all geotypical ground textures and for many objects in the library are included. Additional sensor textures can simply be added. To verify the sensor attributes in the internal viewer one may choose between ID-coloured, night vision and grey-scale view.

SERIOUS GAMES

DETAILED DATABASES FOR YOUR GAMES ENGINE

Use Trian3DBuilder to construct new battlegrounds for Bohemia Interactive's VBS2, for Havok Vision Engine or any other real-time engine.

KEY FEATURES

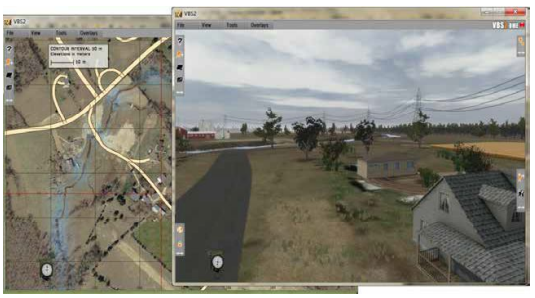
- → Setup or Convert Projects in Minutes
- → Geospecific, Generic and Geotypical Texturing
- → Place Engine Specific Objects or Various Other Formats
- → Generate Buildings with Interiors & Various Roof Types
- → Object Attributes: Collision, Shadow, etc.
- → Edit Exported Terrain Data

EASE OF USE

The VBS2 and Havok Exporter pursues the main application's concept of ease of use. When setting up a project the terrain settings, such as tile size and texture resolution, are automatically adjusted to the chosen format constraints. This also applies when switching an existing database's export formats.

GENERATION

Trian3DBuilder is exporting or generating all objects with physical attributes for collision detection and shadow calculation.



SUPPORT

Trian3DBuilder is delivered with extensive libraries of textures, geometries and special ground features including vector definitions. In addition to various tutorials and example projects, optional training courses and project support by TrianGraphics assure fast productivity.

FEATURES

→ Object Placement

P3D Objects from VBS2 library can be imported & placed. Convert existing objects (e.g. from OpenFlight, OpenSceneGraph)

→ Object Generation

Buildings from Outlines with misc. roof types.Free-Standing Walls, Pipelines, Power Lines...Object Attributes, Collision, Mass Definition, Shadows, LODs

→ Texturing

Geospecific, Geotypical, Generic
Render to Texture

→ Modifiers

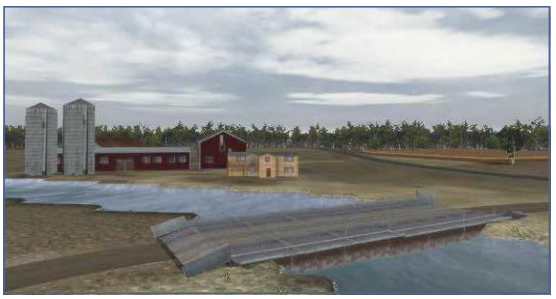
VBS2 Surface: define clutter objects, surface types
VBS2 Object: define armour, destruction type etc.

→ Road & River Templates

Road: various underground texture types, width, construction rul
River: variable heights, lakes

BENEFITS OF TRIAN3DBUILDER

Buildings and objects are generated flexibly from vector data. The vector generation templates can be parametrized to e.g. clutter objects or to form roads and rivers in the render engine.



LICENSING

AS FLEXIBLE AS YOUR NEEDS

Trian3DBuilder is offering a multitude of licensing options. You can purchase only those modules that you really need and extend the software at any time. Conclude with a maintenance contract to automatically receive all software updates and benefit from TrianGraphics' premium support.

PRODUCTS

→ Trian3DBuilder (Core)
export formats included:
OSG(ive, osg), obj, x, 3ds, dae

TRIAN3D MODULES

→ Geotypic Module
terrain textures and object placement without the need of satellite imagery
→ Roads Module
advanced roads and crossings from real-world data
→ Roads Plus Module
includes Roads Module, arc/clothoid curves, tram tracks and OpenDrive exporter
→ Airport Module
automatic airport generation from large library and airport editing
→ Sensor Module
physical classification of terrain and objects
→ Software Development Kit

TRIAN3D EXPORTER

→ FLT/MFT Exporter
export to OpenFlight and MetaFlight
→ GDB Exporter
export to VT Mäk's VR-Forces/VR-Vantage format
→ FBX Exporter
export to Autodesk's standard exchange format
→ VBS2 Exporter
export to Bohemia Interactive's VBS2 format
→ Steel Beasts Pro Exporter
export to e-Sim Games' Steel Beasts Pro format
→ Havok Vision Exporter
static export to Havok's Vision Engine