



imagine

image generator software

real-time 3D technology

terrain visualization



www.imagine3d.fr

Image Generator



We have been developing our IG software for nearly 10 years. Thanks to our innovative technology, we have managed to become a leading IG provider in the ATC simulator world. Our software suite is in use all around the world. It meets the technical and quality requirements of any kind of simulators (including fixed-wing, rotary-wing and fast jet flight simulators).

Easy integration & perfect correlation

Thanks to its clear, simple and efficient C++ API, our IG is extremely easy to integrate into your products. No need to worry about any complex communication protocol and low-level network code, the SDK will automatically handle all of this for you. Moreover, our engineers will actively support you during the whole integration phase, either remotely or on-site.

To ensure a perfectly correlated environment, we also provide a C++ API for our terrain database and scene generation tool. This allows an optional integration into your own editor software if required.

Commercial Off-The-Shelf

Delivering high quality graphics, as well as amazing frame rate performances, our IG software is relying on the latest COTS PC technologies. The system benefits from the constant and incredibly fast performance enhancements achieved in this industry, with low minimal maintenance and upgrade cost.

State-of-the-art 3D engine

Anti-aliasing (MSAA or FXAA) & anisotropic filtering
 Realistic and physically correct dynamic soft shadows (every object in the scene - aircraft, vehicles, buildings, trees - cast shadows)
 State-of-the art per pixel lighting
Unlimited number of real lights with low performance overhead
 Animated characters support (humans, animals)
 NVidia SLI support for even higher performance

Advanced multichannel features

Imagine IG software provides full 360° multichannel support (up to 64 channels), with or without edge-blending. Software and data files are automatically synchronized across channels at each program startup.



Realistic environment

Fully dynamic and accurate "real-time" time-of-day simulation, including seamless dusk and dawn simulation
 Amazing volumetric clouds (8 different types, up to 8 layers)
 Thunderstorms (CB) with both fork and sheet lightning types (including sound)
 Fog/haze (visibility range from 1m to 500km/unlimited)
 Volumetric ground fog banks
 Rain, snow, hail, sleet of varying intensities



Physics simulation

The built-in physics engine allows real-time collision detection and response for all moving objects (against all static - terrain, buildings, trees - and other dynamic objects).

It also offers a wheeled-vehicle physical model for built-in driving simulation.

Vegetation rendering

Our vegetation system allows rendering for large-scale forests. A 3D models library containing 120 different tree types is provided.

Aircraft and vehicle 3D models library

More than 1500 models available, fully configured, including damage simulation (fire, smoke, etc.), realistic aircraft lights (navigation, anti-collision, strobe, taxi, logo and cabin, etc.), animated gears, engines, rotors and flaps, drag chutes support, etc.

And much more

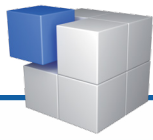
- Picture-in-picture: create an additional viewport to focus on a specific region of interest
- Flock of birds simulation
- Arrestor wires and jet barriers
- Puddles
- Fire vehicle foam dispensing
- Dynamic soft shadows on big area (5km radius)

Volumetric snow accumulation

Our unique volumetric snow accumulation system allows **new training applications**.

Beside a highly realistic snow surface rendering implementation, **clearance path are also available** : simply enable snow clearance for a given vehicle, and make it move - that is all you need to have the snow clearance path being automatically created and rendered.





Hi-resolution terrain rendering



Huge areas

One of the key components of our IG software is our terrain visualization engine. Our amazing technology can render huge geo-specific areas (**i.e. several millions square kilometers**) at an extremely high resolution.

No lag, no stuttering : just smooth

Providing out-of-core rendering, the **fully lockless streaming system** allows quick loading of data with no CPU/GPU synchronization point introduction, resulting in a completely smooth experience whatever the observer move speed is.

Very high resolution

The raster data can be visualized at a 12.5cm/pixel resolution or better. If that is not enough for your application, we have implemented a **multiple-layer system**, which allows adding details on top of the raster imagery at an even higher resolution (millimeter order of magnitude). This allows roads, marking and other similar features to be rendered in an extremely efficient way.

All common GIS raster formats are supported (GeoTiff, JPEG2000, ECW, etc.). SRTM 4.1 data are also supported and can be provided for nearly world-wide elevation data coverage.

Fast data processing

While most terrain solutions either pre-process everything or pre-process nothing, we opted for a hybrid way: we pre-process only what needs to be pre-processed, and perform all the other operations at runtime.

Due to their nature, raster data sets represent a huge amount of data. Therefore holding everything in memory is not an option: data sets have to be loaded from disk.

Fast streaming means fast data access. Fast data access requires an efficient disk storage architecture, with compact data chunks and a reduced disk seeking strategy.

Our data pre-processing step handles all of this for you. It is **fully multithreaded** and scales automatically according to the number of CPU cores available, dramatically reducing the time required by this phase.

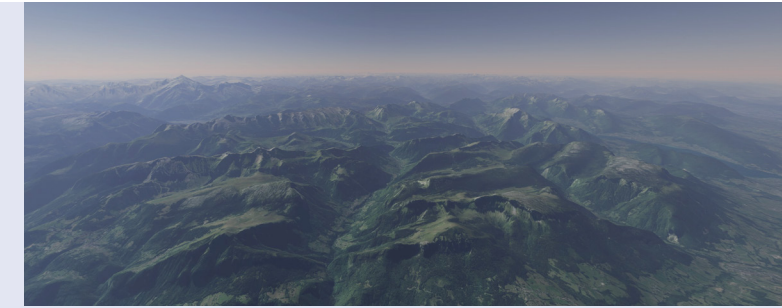
Popping free level-of-details scheme

The terrain engine implements a unique geomorphing solution that makes its level-of-detail system completely popping-free. All components smoothly interpolate with no visible level-of-detail switch at all (elevation data and lighting).



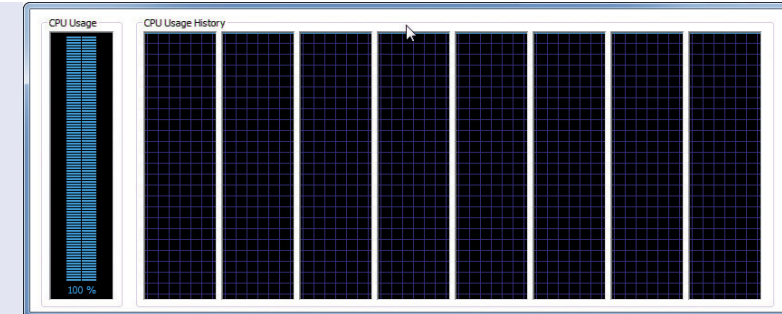
Ultra-fast lockless data streaming

- Compact data storage and minimal memory usage
- Lockless parallel data streaming
- No stall due to memory transfer
- Asynchronous on-the-fly compositing of raster and vector layers
- GPU-friendly data compression



Blazing-fast pre-processing

Our data pre-process step does what is required to allow ultra-fast streaming, and only that. It automatically adapts to the resolution of each source raster data used, in order to avoid any unnecessary costly processing. It features an automatic multi-core CPU scalability for a full utilization of the processing power available, with a state-of-the-art lockless parallel implementation.



Support for major GIS formats

All major GIS raster formats are supported, including (but not limited to) GeoTIFF, TIFF with a world file (.tif / .tfw), JPEG2000, ECW, Mr SID, ERDAS Imagine (.img), ESRI shape file (coverage), including source image transparency channel and polygon coverage mask (shape file).

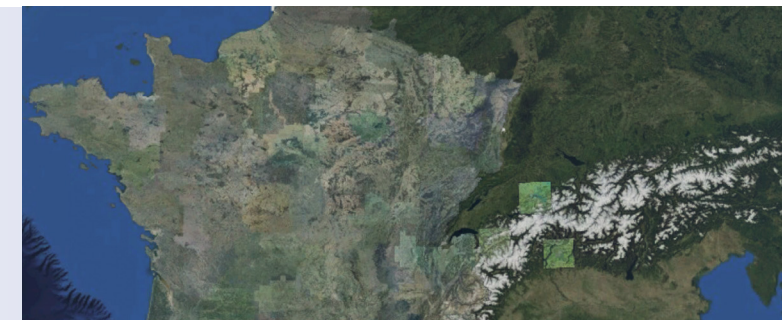
Support raster data resolution up to 12.5cm/pixel (or even better if you can find such data !).

Compatible with SRTM 4.1 and ASTERv2 elevation data, as well as with NASA BlueMarble data sets.



Fully correct geo-referenced pipeline

Our new terrain rendering system provides a fully correct geo-referenced pipeline, from the original GIS data source to the final 3D scene used in your simulator. Since no exotic coordinates transform occurs anywhere during the data workflow, it not only makes data correlation much easier, but also ensures the most accurate simulation experience possible.



Vector rendering

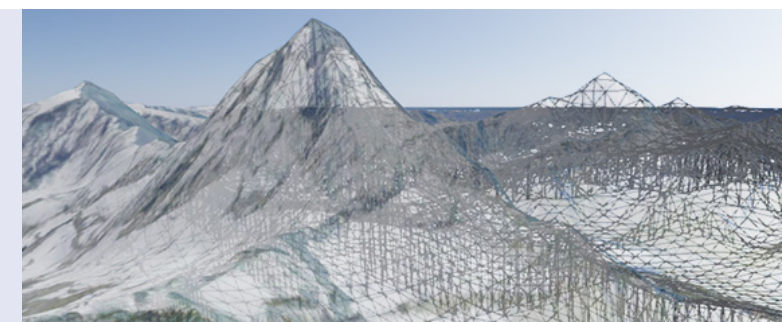
All types of vector layers are being handled and rendered at runtime :

- HD materials mask (i.e. asphalt, concrete, etc...)
- Plain color or mega texture (i.e. road/runway marking, skid marks, etc...) at sub-centimeter resolution (less than 1cm per texel)
- Terrain elevation filters (i.e. area/roads flattening, etc...)
- Vector layers used for internal purpose (snow clearance path, puddles, etc...)



Geomorphing

What can be more distracting than a mountain constantly popping while approaching it, due to a sudden LOD change? Our technology features a unique state-of-the-art geo-morphing solution, with no visible geometry, texture or lighting popping.



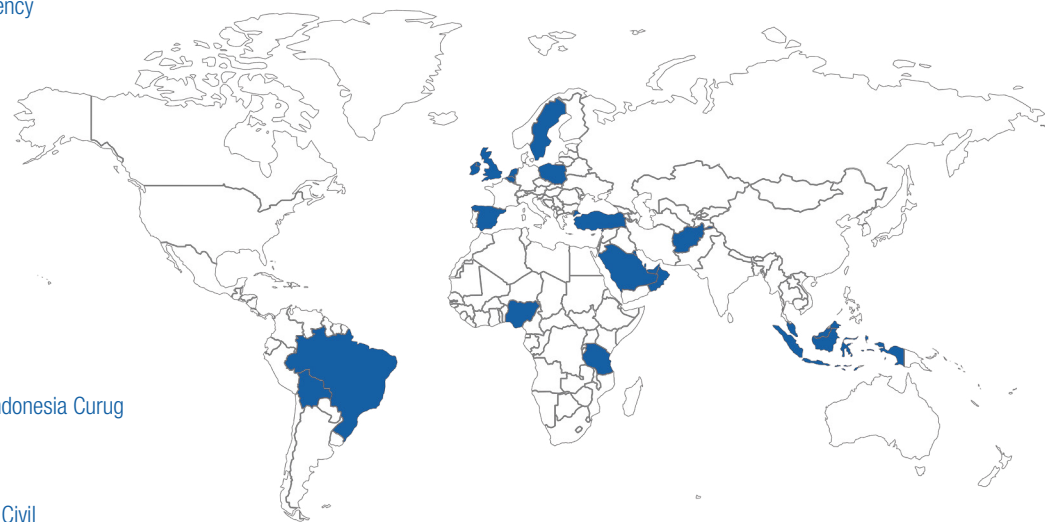
Proven track record



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■ Our IG software is now used in 19 countries around the world. Both civil and military users are training every day using our products.

- UK: Micro Nav, NATS, Swissport Standsted, Dnata, Newcastle Airport
- Ireland: Irish Aviation Authority
- Sweden: Entry Point North
- Poland: Polish Air Navigation Services Agency
- Netherlands: Royal Netherlands Air Force
- Belgium: Brussels Airport
- Spain: GECI Española S.A.
- Turkey: Anadolu University
- Saudi Arabia: Royal Saudi Air Force
- Dubai: Department of Civil Aviation
- Oman: Oman Aircraft Control College
- Qatar: QCAA
- Malaysia: Department of Civil Aviation
- Malaysia: Royal Malaysian Air Force
- Indonesia: Sekolah Tinggi Penerbangan Indonesia Curug
- Afghanistan: Ministry of Transport/ICAO
- Brazil: CISCEA
- Bolivia: Dirección General de Aeronáutica Civil
- Nigeria: Nigerian College of Aviation Technology
- Tanzania: Tanzanian Civil Aviation Authority



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About us

Imagine, founded in 2006, in Alsace (north-east France), focuses on interactive 3D visualization applications.

We released the first version of our IG software in 2007.

Since then, our IG has spread out around the world: in Europe, in the Middle East, in Asia, in Africa and South America. All systems delivered so far are still in use.

Our team is composed of experienced software engineers coming from different backgrounds (simulation, GIS, video games...), gathering a high level of expertise in complimentary fields.