3DReshaper v. the Night King: modelling a Game of Thrones' scene

Game of Thrones, the well-known American fantasy drama has won more than 200 awards including creative arts for special visual effects (VFX). The VFX is responsible for accomplishing visual tricks in film making, like placing, moving or duplicating digital characters or modifying and extending set backgrounds. By using modern 3D technology, all of the film maker units can save time and money for both the studio and the producers. In addition, any later modifications are easier by having the precise model of the scene available digitally in 3D.

The models created for GoT consist of every type of element and are ready to be digitalized in a couple of hours; including buildings, sculptures, vehicles, masks, props and even the whole terrain itself.

Image Courtesy of BURKEN | OCUPLAN

Solution

In order to build a 3D model, the sets have to be properly measured to gather all the geometrical information and location of each element and prop. Usually this is done with a 3D laserscanner. It is rather common that during this data capture hundreds of millions of points are measured in dozens of different scans position. To have a homogenous result, the positions need to be adjusted to each other with 3rd party software applications.

Having processed this quality controlled pointcloud, the next step is the 3D model generation. For this purpose, BURKEN-OCUPLAN alliance have been using 3DReshaper since 2010 and so far modeled 40+ film sets. They include all types of sets (studio, external and terrain) in more than 10 countries for several films. The conclusion we have arrived at is that 3DReshaper is extremely fast, has ease of use, and compatibility is not an issue.

Critical factor

Even with the fact that 3DReshaper is a very fast application, time is always the most critical factor in such projects. The customer always expects the models within days, even for complex, 'facility sized' sets like Castle Black. This tight schedule means there is no room for errors and the best solution is required for each working phases: measurement, data processing, 3D modeling, and quality-control.

Process

In addition, to increase speed, there are numerous notable features that helps the 3D meshing process.

The following list is just part of the full features which are available in 3DReshaper:

1. A powerful engine under the hood allows handling of very-large data, like this set, which was made from 2 billion points.

2. A commonly used noise filter, which eliminate noise and non-relevant points to have a smooth and sharp pointcloud before the meshing process.

3. Deviation filter to reduce unnecessary points and keep only the best points to achieve the most accurate result as possible.

4. Filling holes in the mesh can be a nuisance since pointcloud coverage is never even. Thus thousands of holes can appear in the mesh, but with 3DReshaper a few clicks is enough to properly fill these holes automatically.

5. High accuracy and compact file size. This is achievable with the Reduce Mesh command – which keep the main geometry and the accuracy and reduce the file size massively. This is always welcomed by 3rd party end-users.

6. 3DReshaper's interoperability allows the import of CAD models coming from 3rd party softwares. This extend the usability of the application and allow the creation of hybrid mesh models, which are the best solution for built, non-natural sets.

Image Courtesy of BURKEN | OCUPLAN

7. Before handover a quality control is always recommended where model and point cloud can be compared to each other and any deviation represented in a colorful error map for easier understanding.

Outcome

As stated above the interoperability extends the application usage area even wider. For GoT and for VFX it is also rather useful for two main reasons:

• 3DReshaper makes data handover seamless and unequivocal toward many 3rd party applications, including computer animation and modeling software, like Maya, Blender, etc. without any information loss.

• 3DReshaper allows the usage of CAD geometry coming from other application. Essential for any occasion when sets have a lot of man-made elements with flat, regular shapes. A building façade or even a wooden structure is a good example of that. This so called hybrid method was used in the current sample and reduced the processing time by 1/3 while keeping the utmost accuracy and a very compact file size.

Software

This unique point meshing knowledge allows point cloud treatment without any size limit and provides high quality models, accurate and light weight, even with poor quality measurements. This tool allows us to receive point clouds from all digitalization equipments and to treat them in a very short time.

This technology is available within the 3DReshaper software and is used in a wide range of domains for example: Land Surveying, Cultural Heritage, Mines & Quarries, Architecture, Civil Engineering, Nuclear Plants, Jewellery, Rapid Prototyping, Electronic & Semiconductors, Medical, Dental, Automotive, Aeronautic, Shipbuilding, and now for VFX as well.

About Burken Company

BURKEN is a privately owned Hungarian company, offering specialized 3D survey, measurement, and modeling services with our alliance (OCUPLAN, PLANIT3) all over the globe since 1998.

These cutting-edge solutions are delivered by an expert team, including architects, land surveyors, GIS engineers as well as structural engineers.

The BURKEN- OCUPLAN-PLANIT3 alliance has completed projects for hundreds of facilities and locations in every market, including nuclear power stations, substations, airports, oil refineries, factories, filming sites, public and residential properties, telecom, and even underground caverns.

About us

Technodigit, part of Hexagon Group (leading global provider of design, measurement and visualization technologies), is a French company located near Lyon.

3DReshaper is an easy-to-use and affordable software dedicated to point cloud processing. The standard version includes a wide range of featurese:

- Point Cloud Processing
- 3D Meshing
- Inspection & Features Extraction
- Alignment
- Sections & Polylines
- Scripting
- Etc.

3DReshaper can also be completed with some additional modules :

- CAD Surface Modeler
- Textures and Cameras
- Surveying Plug-in
- Tank Plug-in
- Cloudworx Plug-in
- AutoCAD Plug-in

Architecture

Art & Cultural Heritage

Digital Terrain Model

Tunnels

Civil Engineering

Mines & Quarry

Tanks

Shipbuilding

VFX & Cinema

Technodigit,
the **Reshaper** Technology
part of **Hexagon**

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