VR-Design Studio Version 7

Formerly UC-win/Road

Cluster System （**paid option**）

(1) Overview of cluster system

The cluster system has been developed for the large-scale driving simulator.
This system will synchronize two or more PC's and output the image to multiple monitors thus it becomes possible to secure the constant performance without influence from the number of channels because each channel is displayed on an independent PC.

It is still possible to output from one PC to two or more monitors without using a cluster option however you will find the performance of the system decreases as the number of channels is increased.

(2) Structure of Cluster System

The cluster system is composed of a master machine and multiple client machines.

Master Machine
The simulation is calculated by the user's operation with the master machine.

Client Machine
Required information for displaying the VR space is received from the master machine.

Synchronism of channel
This system transmits the data from master to the client using multicast on UDP. The number of clients doesn't depend on the communication performance of the master machine, by using the multicast many client machines can be connected even when using the usual network hardware.

Synchronization is performed only on the Ethernet network at this time, but a special system of Quadro G-Sync that NVIDIA Co is offering, when used, will improve the system in the future.

Failsafe Processing
This is a mechanism that the simulation and synchronization will continue with a usable client machine even if an unexpected breakdown occurs, the cluster system doesn't stop. Moreover, when the client machine doesn't respond temporarily, the synchronization is automatically restarted.

(3) Channel Composition

This is a system that projects to a large screen or the entire sphere by dividing the projector or the monitor and displaying the scene in all directions while moving each client machine to the left and the right etc.
The following two kinds of settings are possible as the projection method.

- Large screen composed of two or more monitors or projection for digital signage
- Projection by plane division for sphere

(4) User Interface

The client side can be easily set up by changing the connection information with master and the name of the client on a setting screen. The control of operation, setting and simulation of each client on the master side is simply possible. The function is prepared as follows.

At the time of setting up :

- Confirmation of list of client machine and display settings
- Server connection information of master, network settings

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At the time of operation :

When the synchronization with clients starts / finishes or it's not synchronized, all functions can be used as well as a stand-alone version. (When synchronizing, only the simulation function can be used.)

(5) Offer form and price

Cluster system is composed of components of master and client. As for the master of the cluster system, a cluster optional license is added to a standard license. The license in which the VR data cannot be edited only for the client is separately prepared. One client license for each channel is needed.

(6) Future Development

- As for the projection method, the spherical projection will be supported on a software side.
- Supports for edge blending software.
- As for the synchronization of display frame, G-Sync of NVIDIA will be supported.
- Several channels will be supported on one client side.

Off Road Function

Users can drive a vehicle around the VR space using a steering wheel, a game controller or the keyboard in UC -win/Road.

Previously, driving was only possible on the road carriageway and the users were not able to drive around the environment if there was no road in the 3D space.

This limitation was removed in UC-win/Road v7. It is now possible to drive off a road and also to start driving anywhere in the environment by setting up a driving start point anywhere on the terrain.

However, the road frictions and sound properties must be manually assigned to the terrain when driving off road. These can be assigned to various terrain textures in the "Edit on the road surface" window. Moreover, other UC-win/Road features, such as the force feedback feature and the scenarios are also available for off road driving.

3DS Output Function

This function enables the output of all models in the 3D space in an arbitrary 3D model data format.
For example, it will be possible to use it with various editors and tools such as 3ds Max by outputting it in 3ds format.

Making the 3D model data format as 3ds format, it's planned to be expanded in order of precedence, FBX format, Obj format, VRML format, OpenFlyght format.

xpswmm plug-in

The script and the scenario function were added to the xpswmm plug-in.

As a result, it has become possible to reproduce a chain of events, such as the height of the water surface, displaying the contour and displaying the reflection of a tsunami etc.
The reproduction speed and the repetition or the reproduction can be controlled in the playback function.

The display of the analysis results can be controlled according to the simulation and presentation. The analysis data of xpswmm can be utilized more easily and is more interactive than before.

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Function under Development

Civil 3D plug-in

The Civil 3D plug-in is a plug-in that achieves an interactive data exchange with three dimensions CAD "Autodesk Civil 3D" for the civil design and construction.

It mainly corresponds to the terrain, road alignment and data exchange of vertical alignment. Older version supported until Civil 3D 2011 conventionally, whereas Ver.7 will support the latest Civil 3D 2012 as well.

In addition, not only 32 bit of Civil 3D but also 64 bit will be planned to be supported.

Speedometer

The speedometer and the tachometer can now be displayed while driving simulation. You can switch ON/OFF in the setting of drawing option. Moreover, (km/h) and (MPH) display can be switched, and the display position can be adjusted.

Support for the video card manufactured by ATI

So far, the video card manufactured by NVIDIA is recommended for UC-win/Road, but we are handling to support the one manufactured by ATI formally. Though it can be confirmed that most functions operate normally, the following functions will not display properly.

1. Problem of drawing of road obstacle （a disarray of texture or an error)
2. Problem of advanced lighting （A streetlight and headlight cannot be shown.)
3. The texture of a sky is now shown properly.
4. A shadow cannot be displayed.

Future Development

In VR-Design Studio Ver.8, we will have the advanced visualization of dazzle a more realistic expression of shadow and the improvement of the reality of the driving simulation (the feeling of speed by the motion blur) will be introduced.

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