

hecoos Event, Exhibition, design and realization

Quick Start Guide

a~o “Basic” build fundamental

p~u “Application” connect practice

hecoos User Guide

What is hecoos

hecoos Studio is a 3D visualizer and project designer. Based on real-time rendering, hecoos studio can simulate stage, lighting, images in the 3D visualizer, performing a full event rehearsal combined with the timeline. At the same time, control projectors, LED screens, lighting fixtures, audio, machinery devices via hecoos Server (media server) to achieve seamlessly adaption between software designing and on-site execution.

What can hecoos do?

hecoos develops six core modules based on regular scene rehearsal function, abundant market researching and demands of actual performance:

i. Real scene simulation

Based on object texture and environment constructed by hecoos, it can build the realistic effect of the interactive scene with lighting, stage, etc. Experience the visual perception the same as the actual stage, feel the delicate simulation of rehearsal not only on the lighting effect.

ii. Projector design & 3D Mapping

Simulate the projector light path and image distortion of a real projector, accurately measure the illuminance and block of the projector in the real environment, and easily complete the projector design and 3D mapping of various complex models through built-in projector parameters of various brands. Through 3 to 6 reference points, hecoos can calculate the position, attitude and output screen of the projector within the software. The collaborative working by multiple engineers will greatly improve the workflow efficiency.

iii. Timeline based playback system

The hecoos has non-linear timeline editing mode and generates multiple effects on media materials. With powerful codec technology, hecoos can achieve high-resolution video decoding and smooth playback for almost any format. Combined with central control and cloud control system, hecoos can perform remote control to the project at any location.





iv. Lighting rehearsal and programming

The lighting effect is essential for the stage atmosphere. The hecoos use built-in fixture from popular brands. Based on Artnet protocol to adapt fixture to hecoos, it can achieve programming of the lighting, simulate real lights and shadow effects, reproduce the colorful lighting of the scene.

v. Tracking and real-time rendering

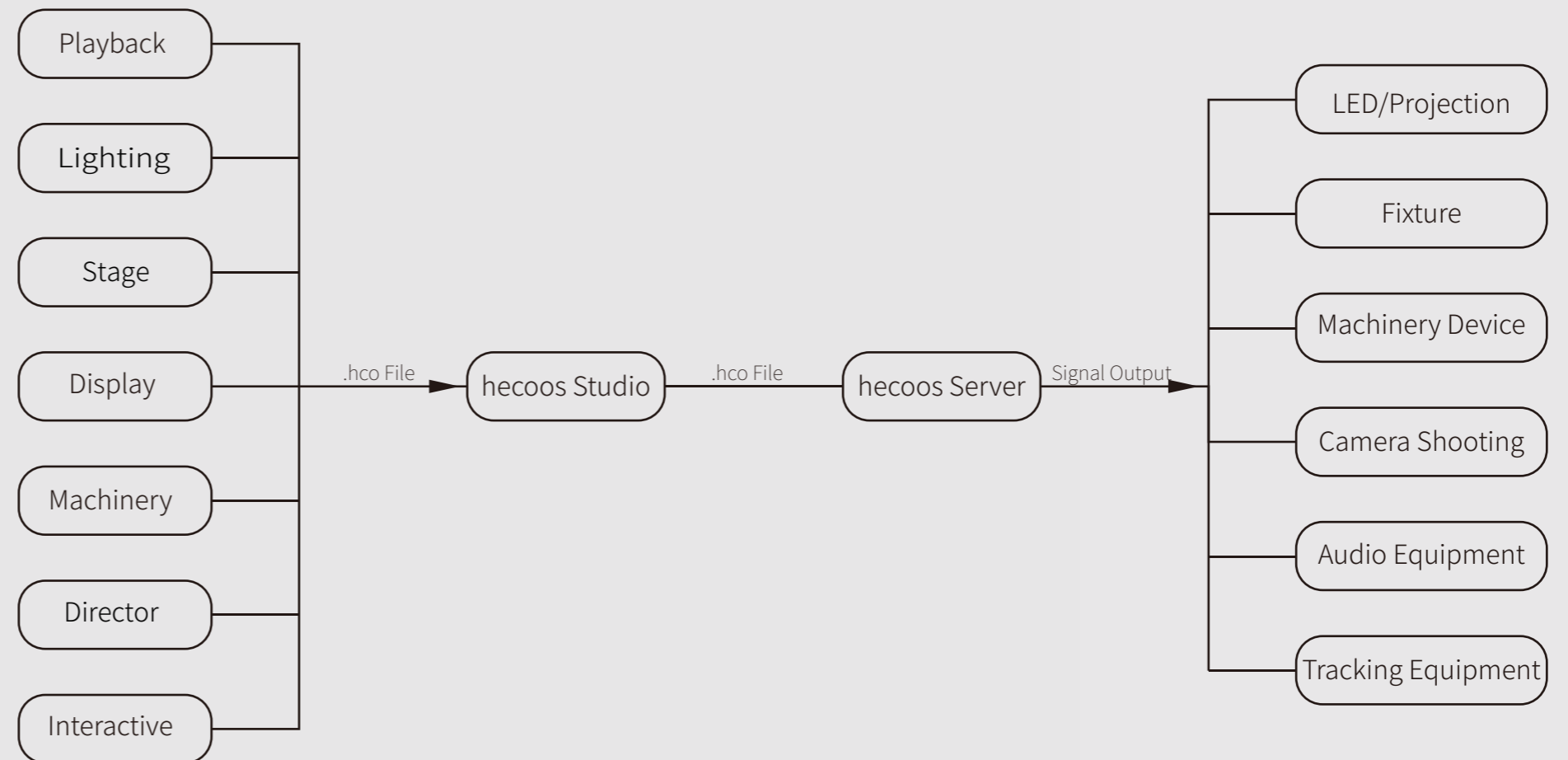
The hecoos supports infrared-based optical positioning sensor to achieve accurate tracking of moving objects. Combined with 3D Mapping technology, hecoos can complete image tracking. Support Notch, Unity3D, Unreal Engine 4, TouchDesigner, and other real-time rendering engines to achieve interaction with the content.

vi. Visualized Director

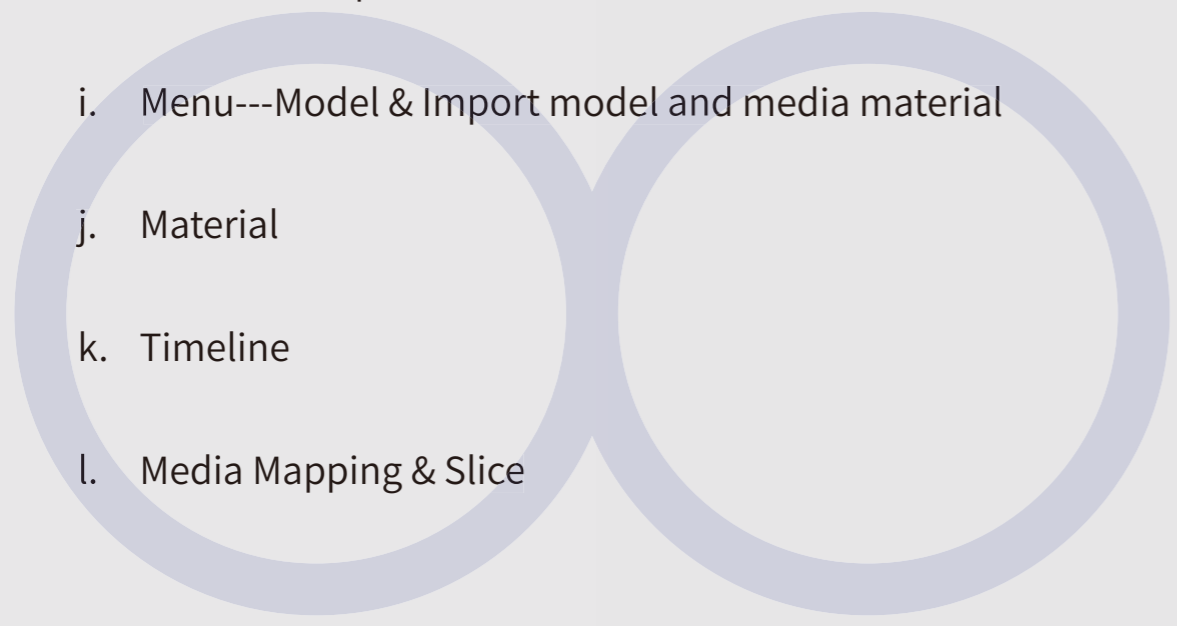
The hecoos uses multiple types of built-in cameras (crane, track, etc.), let you preview camera shooting pictures in advance. Based on the timeline control mode, hecoos can achieve accurate director switching. By cooperating with other software in the workflow, you can complete the director switching task automatically, and seamlessly adapt the director design to the on-site execution.

hecoos Studio & hecoos Server

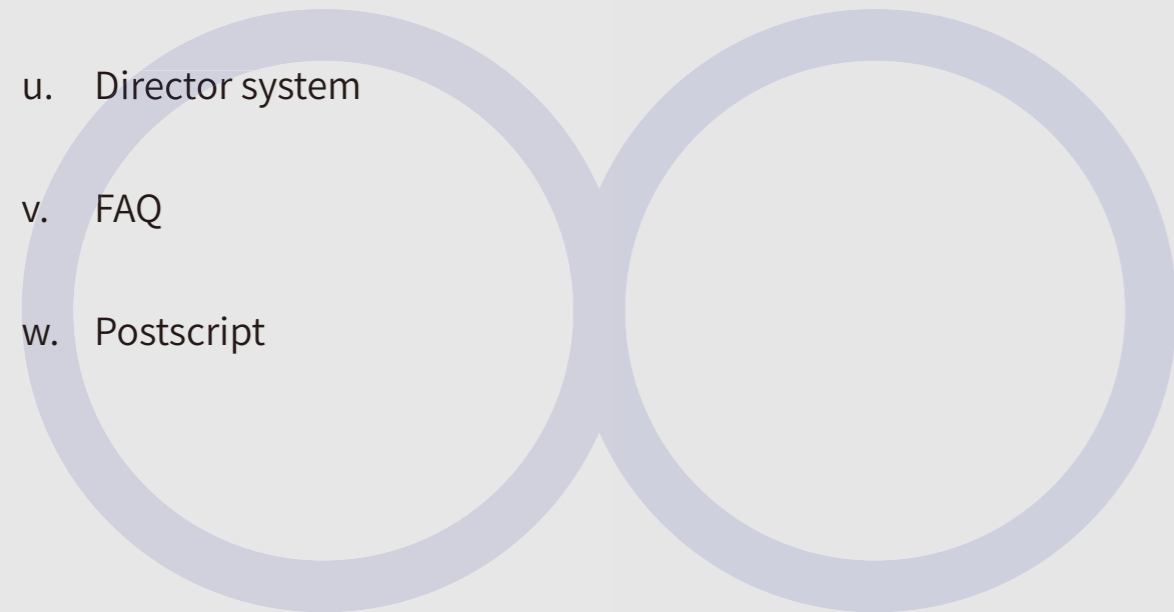
hecoos software comprises two parts: hecoos Studio and hecoos Server. After finishing technic scheme, progress and rehearsal in heccos studio, you can import project files into heccos server to accomplish final project presentation, that covers all control and playing for sound, light, electric and machinery.



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a. hecoos studio download&installation&operation specifications

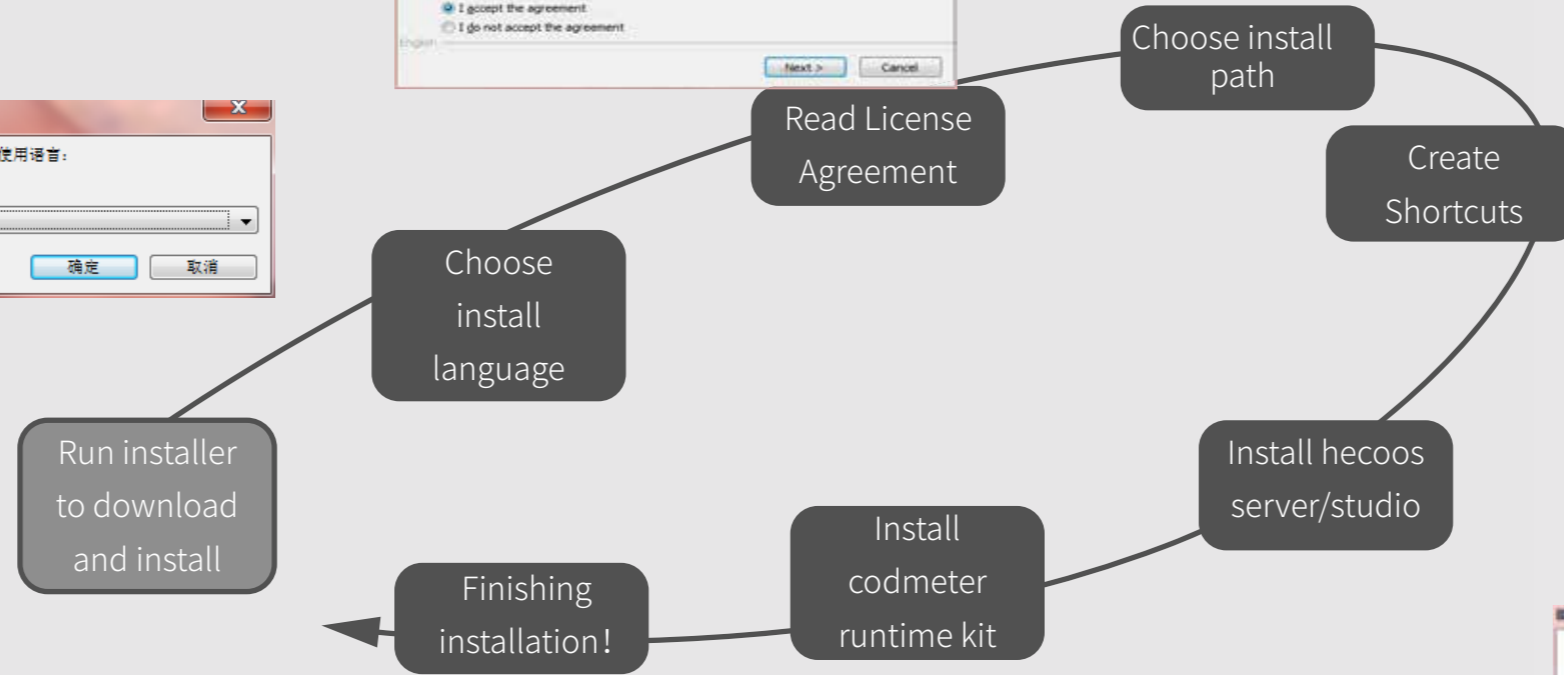
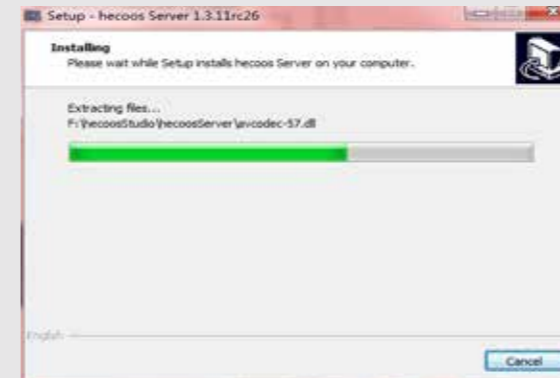
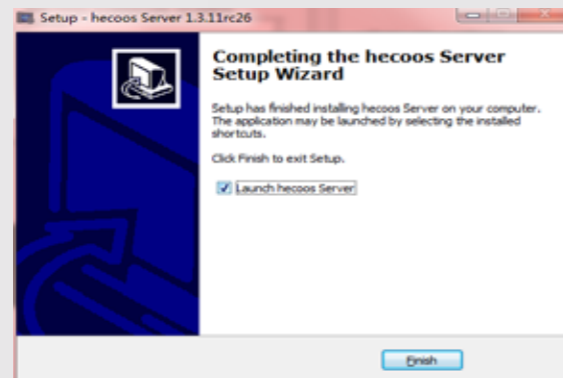
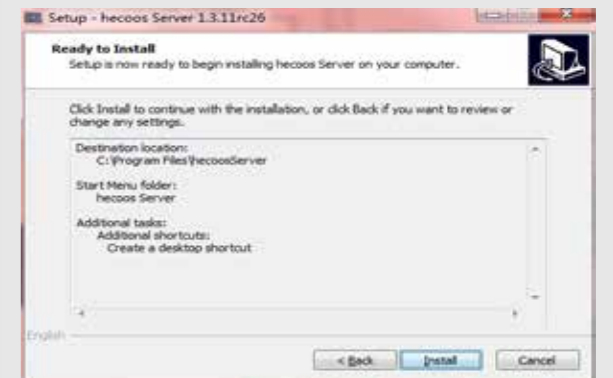
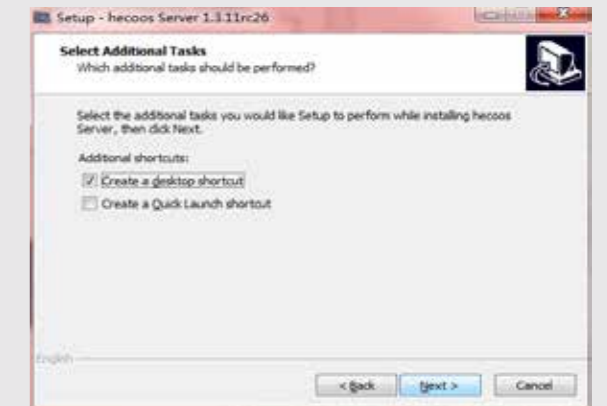
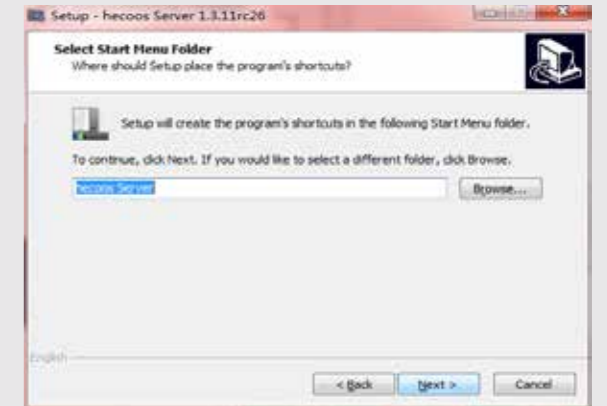
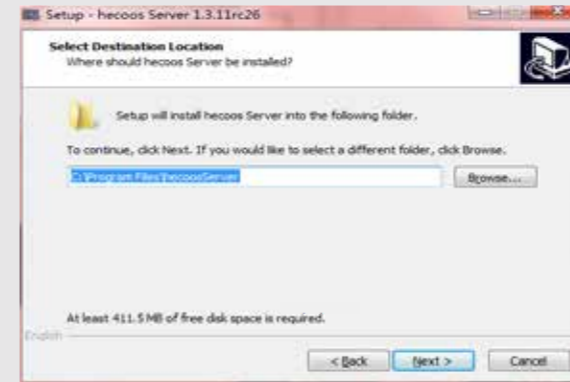
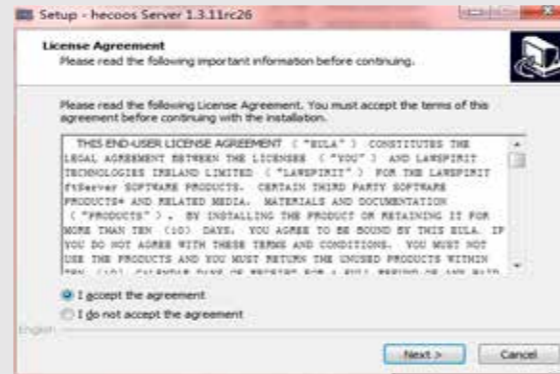
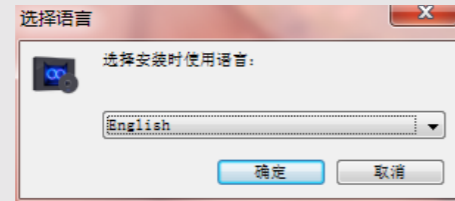
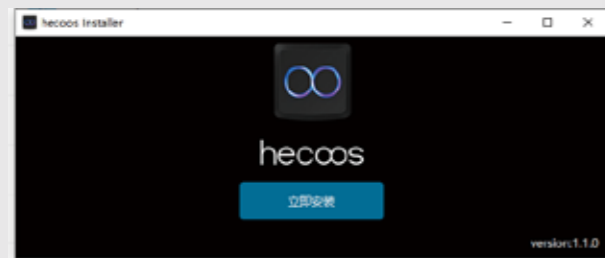
Download address: <https://www.hecoos.com/download/hecoosInstaller.exe>

Operation system: Windows 7, Windows 8, Windows 10 64 bits system

Recommended operation specifications:

- OS Windows 10
- CPU i7 7700 /AMD R7-3750H or above
- GPU Nvidia GTX 1050Ti / AMD RX 560X or above
- SSD 500GB or above
- RAM 16 GB or above

Installation



b. hecoos register & welcome interface


register address: <https://www.hecoos.com/en/login/register>
Please fill in valid information for better experience

login address: <https://www.hecoos.com/En/login/login.html>
You can reset password, purchase/renew membership after logging to user center.

To ensure that you can pass the audit quickly, please fill in the true and effective information.

Name	Company
E-mail	Send
Verify code	
Password	Write your password again
City	Job
Seniority	

Submit

User information	Member Subscription	
Account		
Name		
Phone		
E-mail		
password		Reset password
Company		
City		
Job		
Seniority		
Member time		Renew

We can offer great support service with your information

Dial 400-696-0726 for more product information

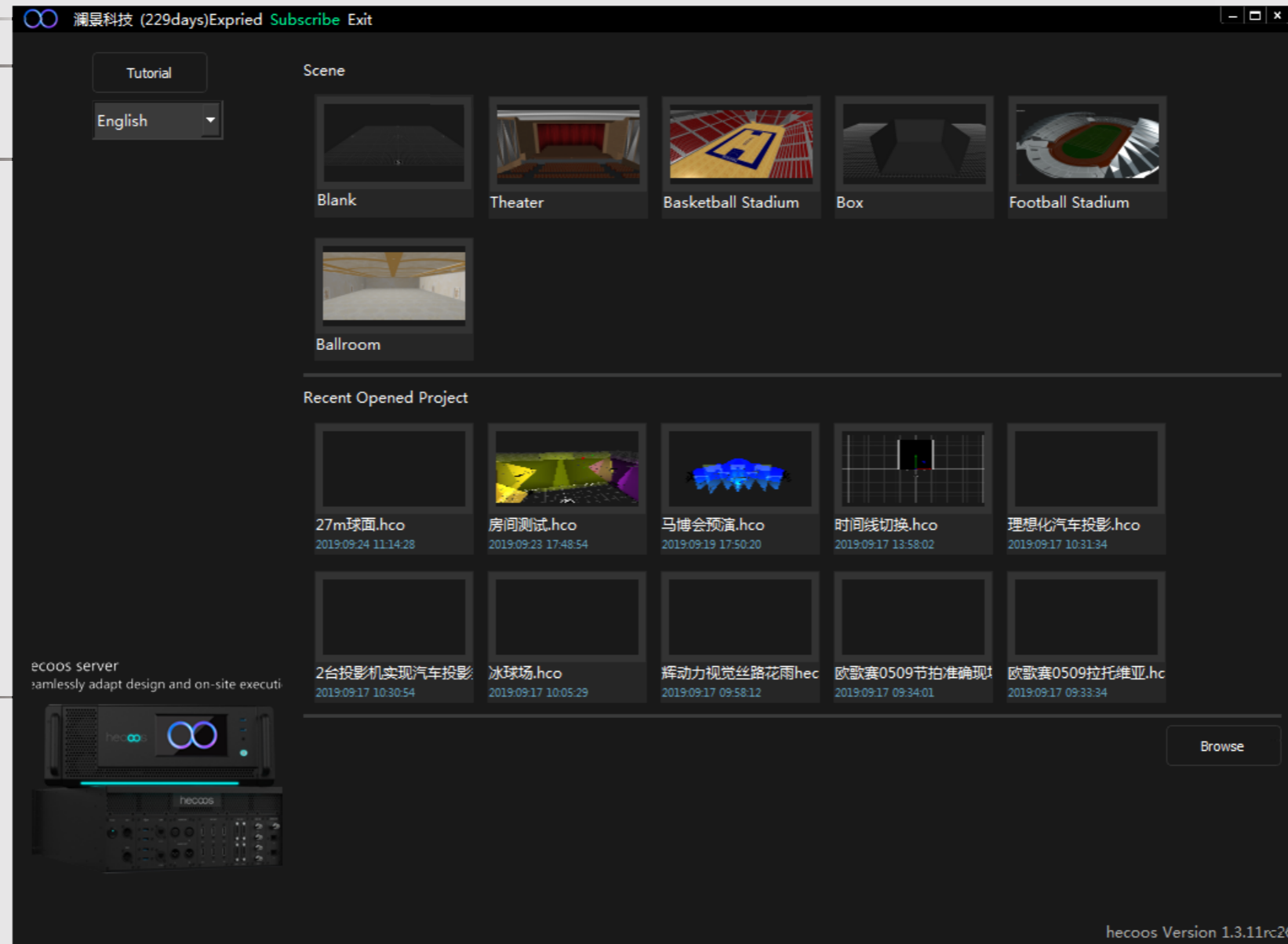
hecoos membership is available for online payment. Join us to get update and enjoy fancy design function.

Welcome interface

User information

Select display language

Introduction about hecoos server



Built-in scene

Include the model of theater, stadium, black box and ballroom for quickly stage construct.

Recent opened project

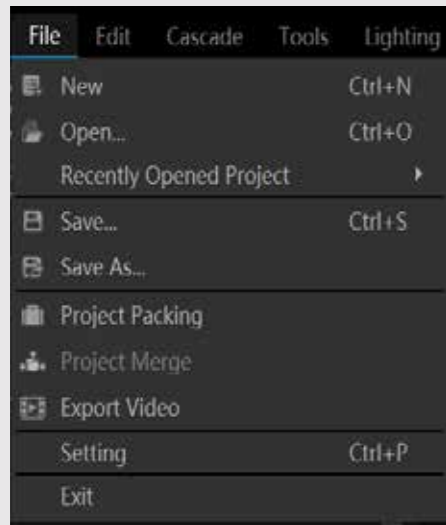
Help you to get access to recent file to continue your charming design

Browse

Open saved project file (*.hco)

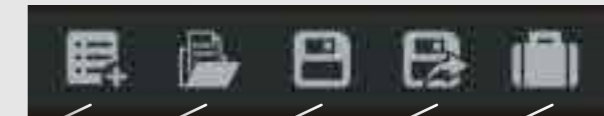
Version information

c. Menu---File

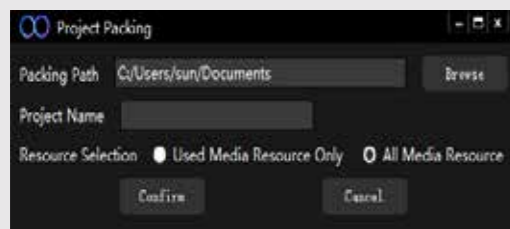


- New Open new blank project
- Open Double-click project file *.hco to open
- Save Saving through original path
- Save as To make backup copy for original project

Shortcuts in toolbar



- New (Ctrl+N)
- Open (Ctrl+O)
- Save (Ctrl+S)
- Save As
- Project Packing

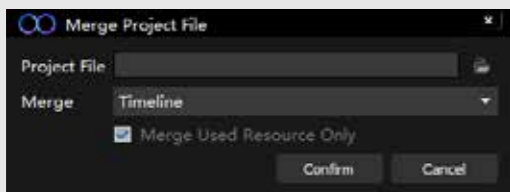


Project packing

Project packing is for project file sharing.

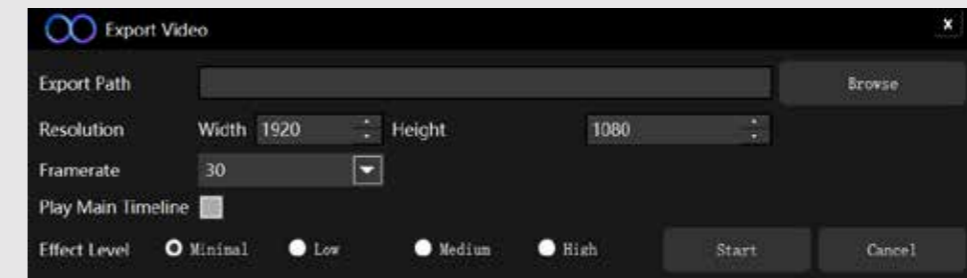
After packing, it will generate data folder include image, model, tools, etc. and operating file (*.hco).

Hint: “Used Media Only” will pack the media you used in the project only; “All Media” will pack all the media you imported into hecoos (Recommended).



Merge Project File

Merge project file is used for combine multiple project file, especially for gathering multiple users’ project file.



Export Video

Record and export current viewport as a MP4 format video file.

You can customize the resolution, framerate and effect for the video.

Setting

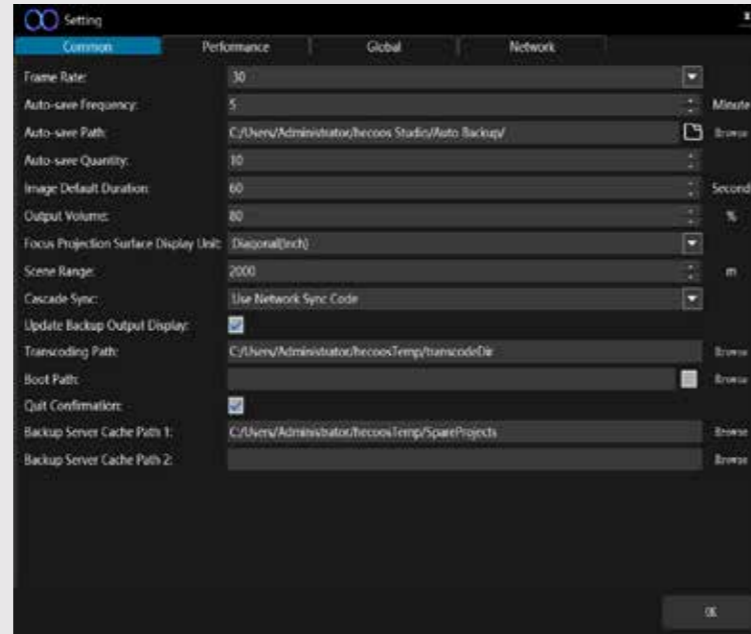
Common

Common Tab is used for setting automatic saving, default/display unit. Automatic saving quantity means backup file quantity in automatic saving path (One project automatic generate a folder, overwrite oldest generated project);

Image default time length shows the time occupy when add image to timeline;

Scene range shows the grid size in stage window;

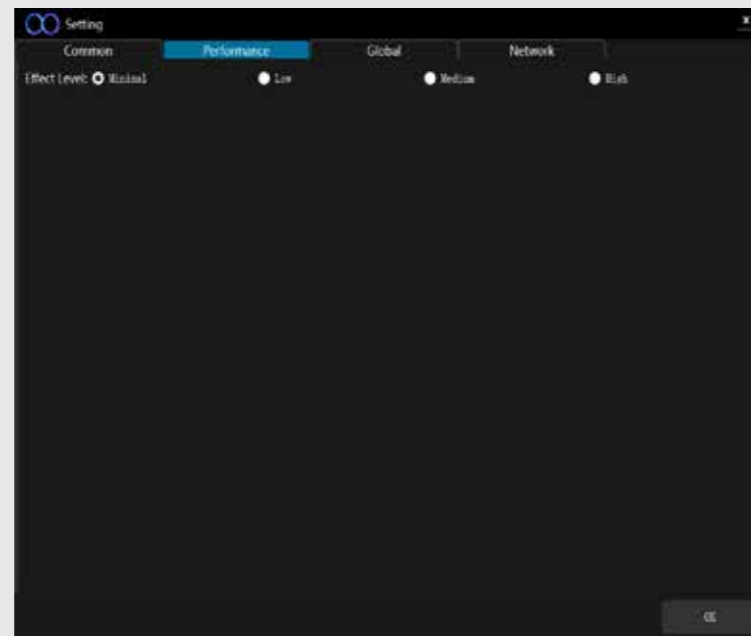
Boot path will launch a project file automatically when the PC restart next time



Performance

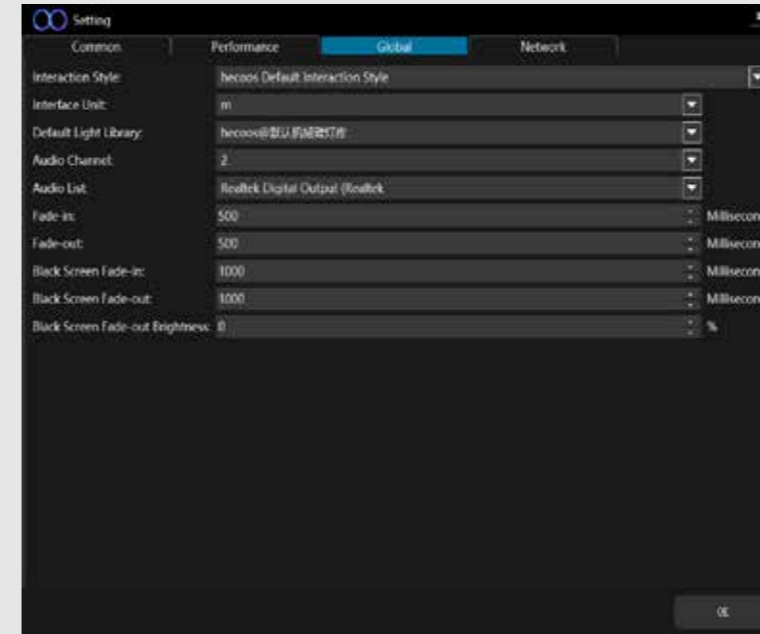
Performance tab is used for adjust display rendering quality, choose lower rendering quality will increase rendering speed and display frame rate.

In minimal or low effect, the lighting textures have been removed.



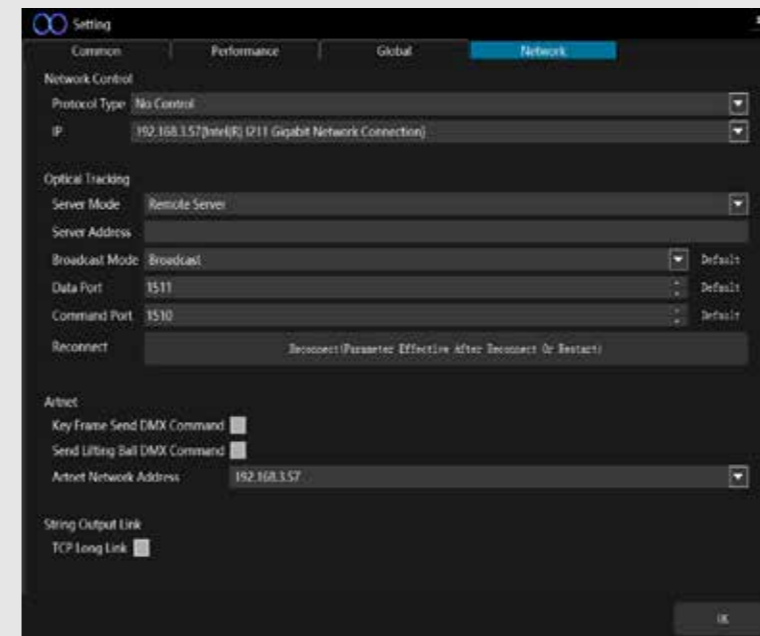
Global

Global tab is used for set operating style (Offer other 3D software operation style selection), unit, light library.

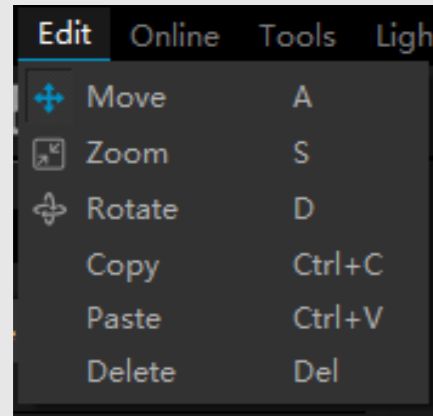


Network

Set multiple connection, time code sync, and send Artnet command.



d. Menu---Edit & Viewport operation

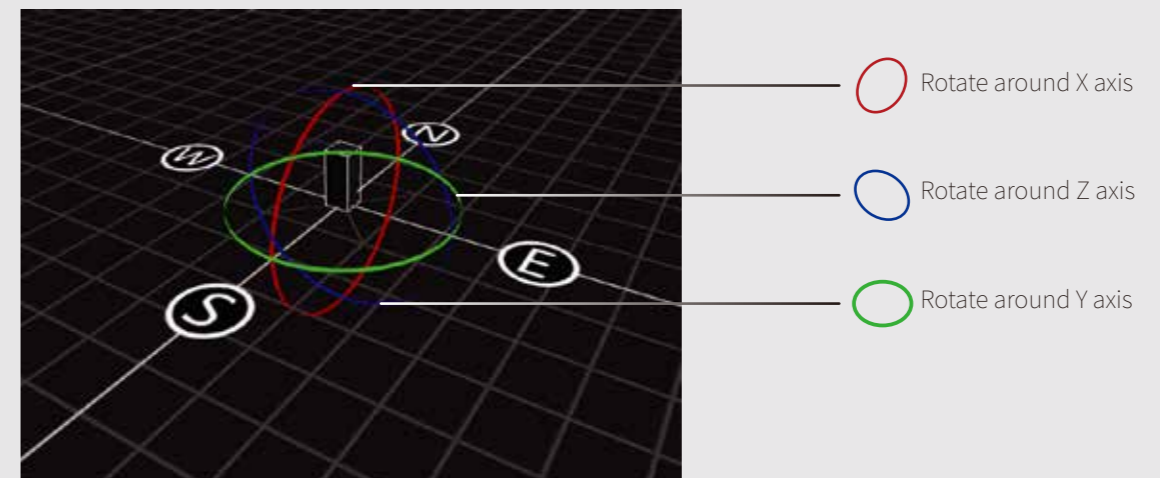
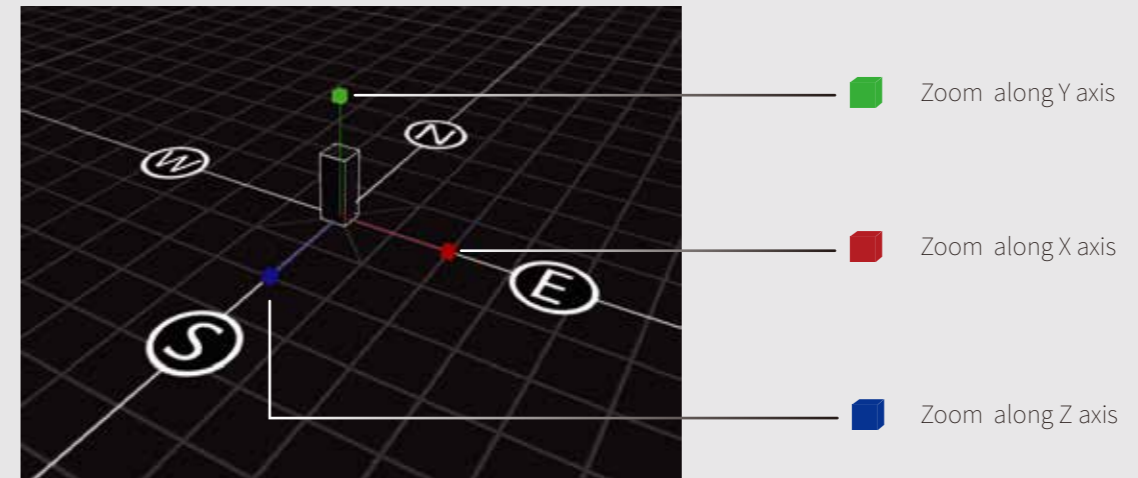
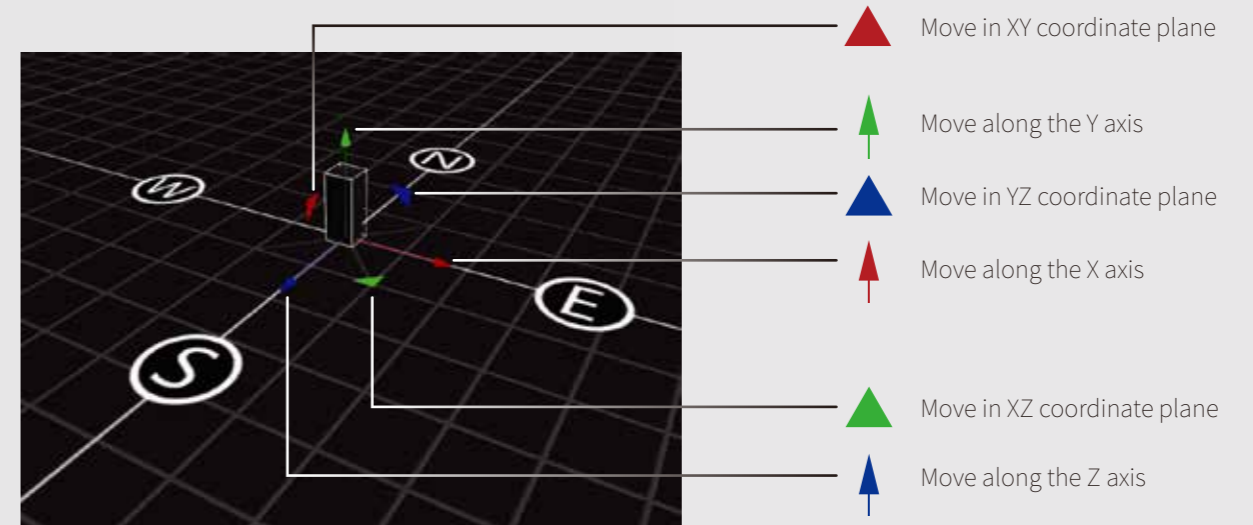


- Move Drag devices within the viewport
- Zoom Effective for custom devices,built-in charactor and tools
- Rotate To Rotate selected device
- Copy/Paste/Delete Same as Windows OS preference

Shortcuts in toolbar



- Move (A)
- Zoom (S)
- Rotated)
- Use global/object coordinate system
(Cooperate with rotate tool)



Stage viewport operation

In hecoos interaction style (other interaction settings: File-setting-global)

Right-click and rotate to orbit viewport;

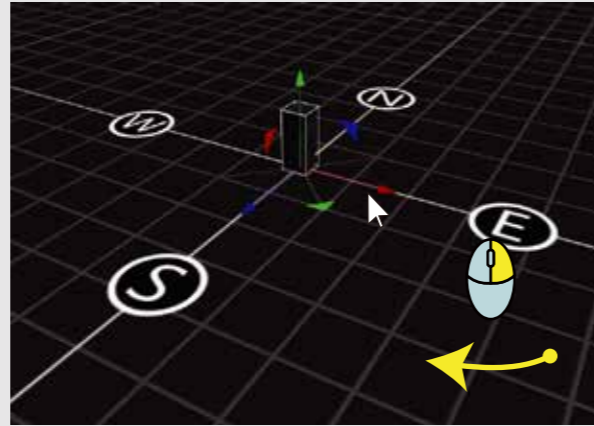
Mid-click and drag to pan viewport(Use mouse position as reference point);

Scroll to Zoom viewport;

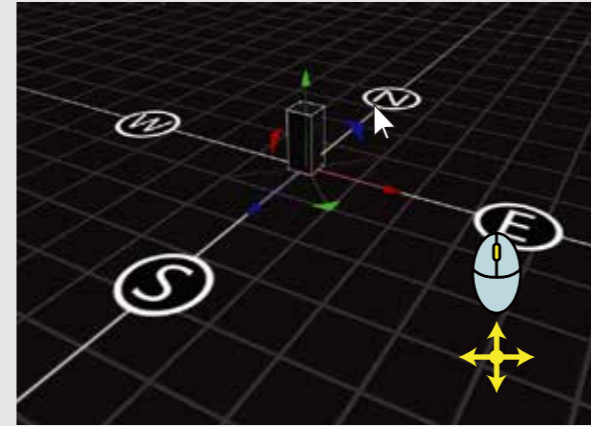
Left-click and/or drag to select device;

Right click to open shortcut menu;

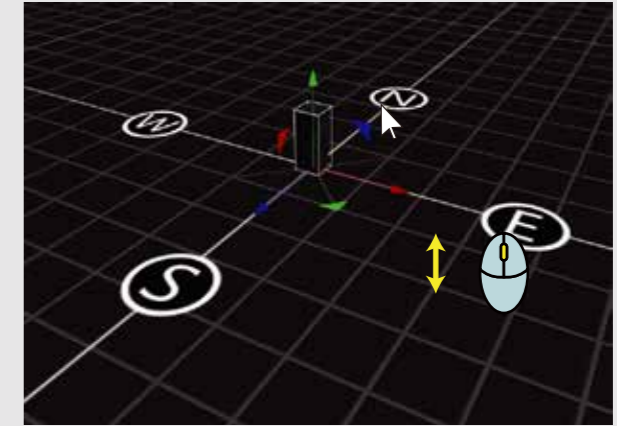
The coordinate indicator at the bottom left will show current direction



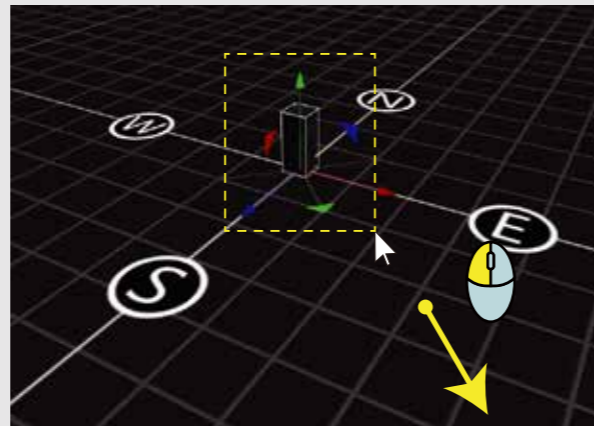
Oorbit



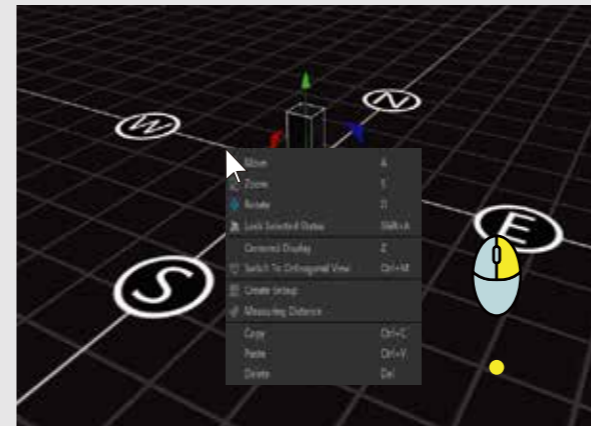
Move



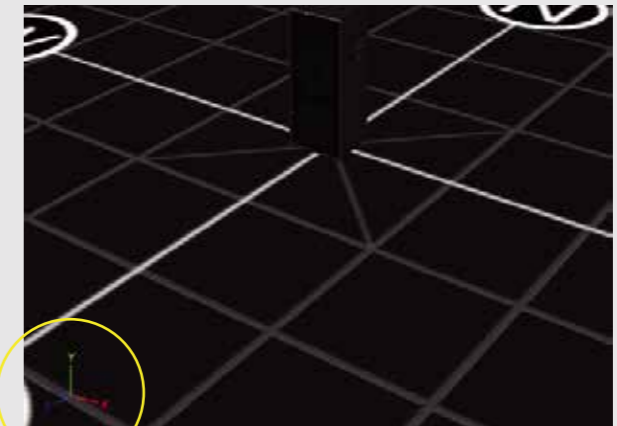
Zoom



Select



Menu



Current coordinate

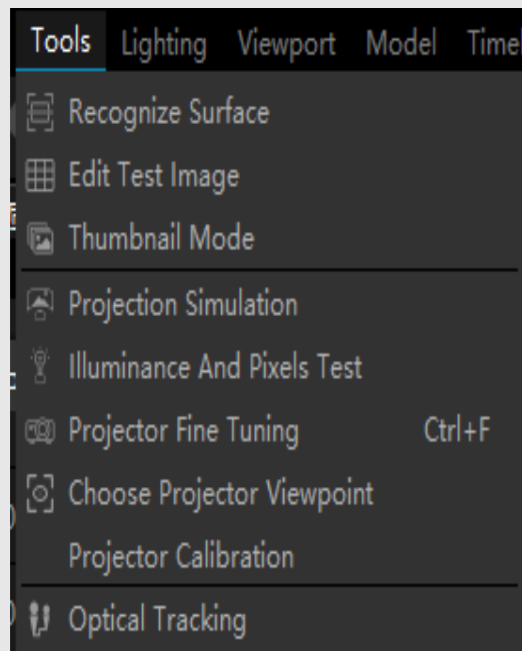
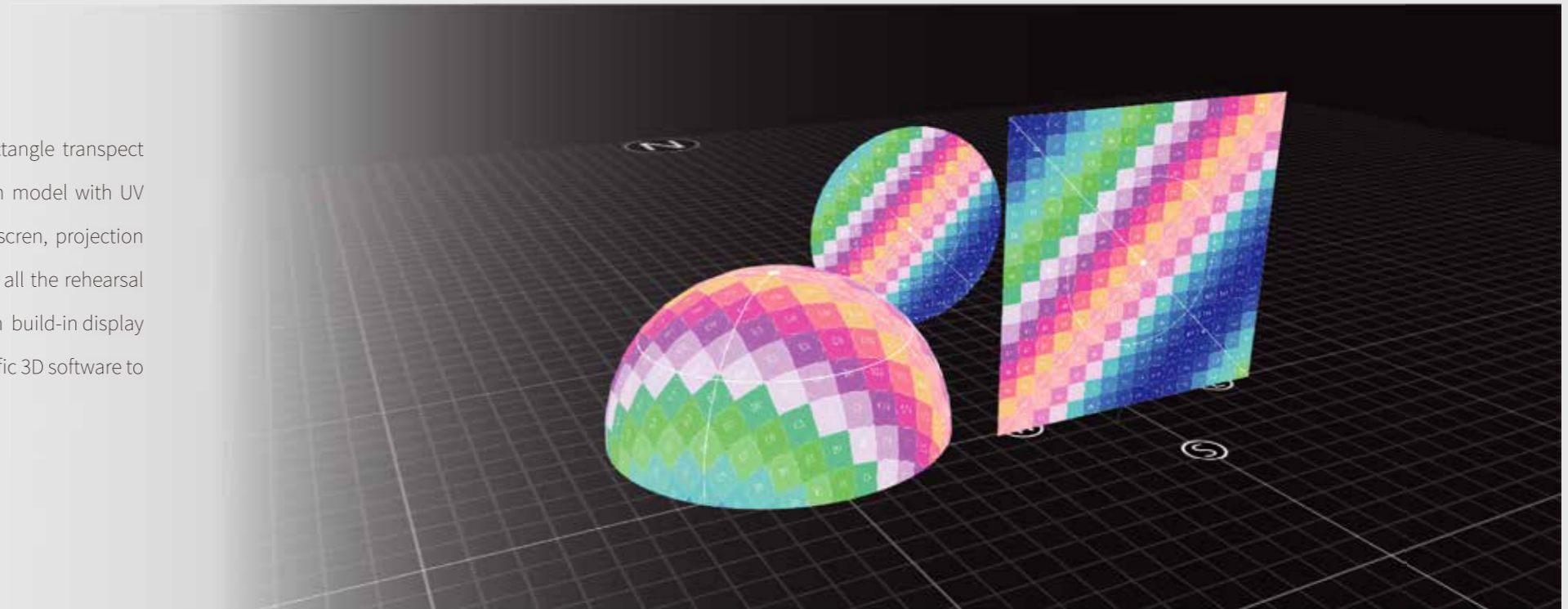


Use “Lock selected status” tool in complicated situation in case of mistaken or lost target

e. Menu---Tools part1

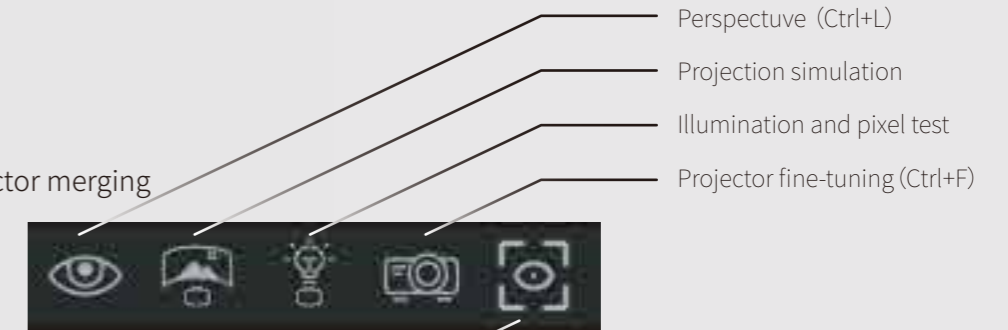
Understand display surface

Display surface is the model that used to mapping media on, include rectangle transpect screen, rectangle screen, dome, triangle screen, round screen, and custom model with UV recognize surface. It's used to simulate the display media including LED screen, projection screen, and LCD screen. Display surface is basic model that support almost all the rehearsal scene in hecoos no matter stage designing, 3D Mapping or video output. Both build-in display surfaces and external ones have UV information, we recommend to use specific 3D software to edit UV information.



- To detect all surface and mapping test image
- To edit test image parameter
- To set the video in the stage as a thumbnail, optimize operating speed.
- Simulate the actual projector working status
- Visualize projection illumination and the pixel value, the visualization without projector merging
- Fine-tuning through projector view
- Dynamic set projector position and posture.
- To calibrate on the complex projection surface for 3D Mapping
- Operating back-calculation by feedback data from sensor and tailor output.

Shortcuts in toolbar



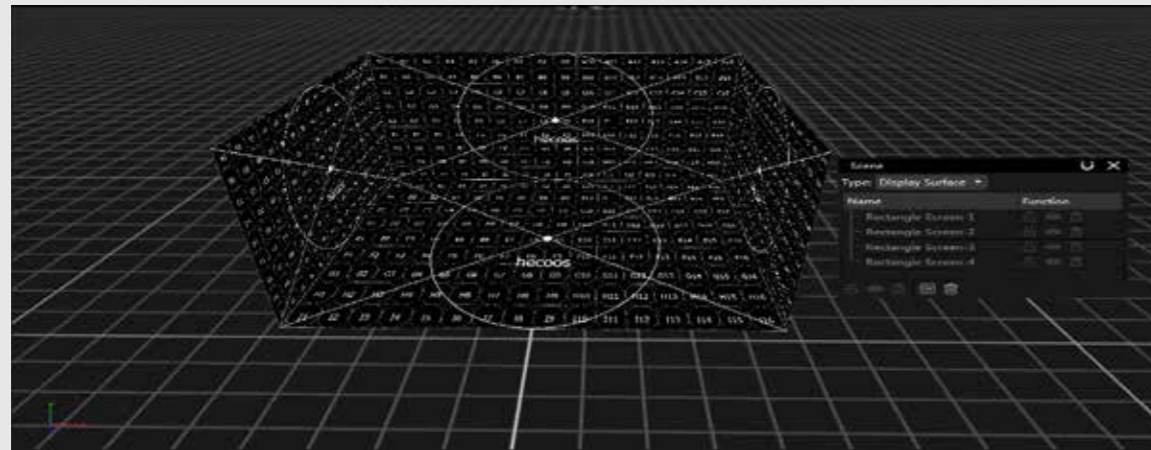
Choose projector viewpoint

(Different with the function in Menu, this shortcut can only adjust projection target point with projector had been settled)

Recognize surface

Map test image (mesh image) on all detectable display surface.

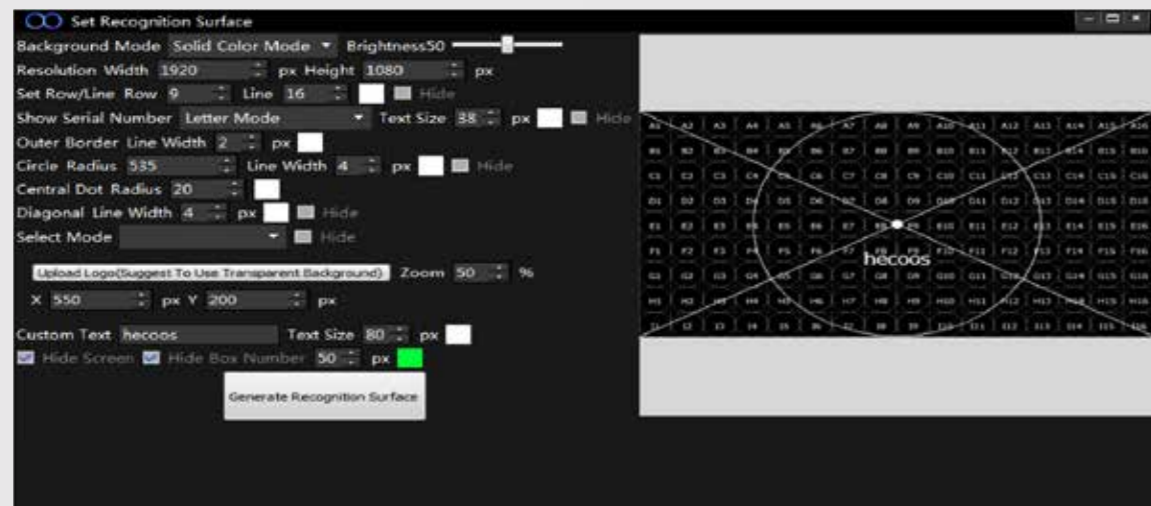
This function is used for fusion band adjustment.



Test image editor

Customize test image for different situation;

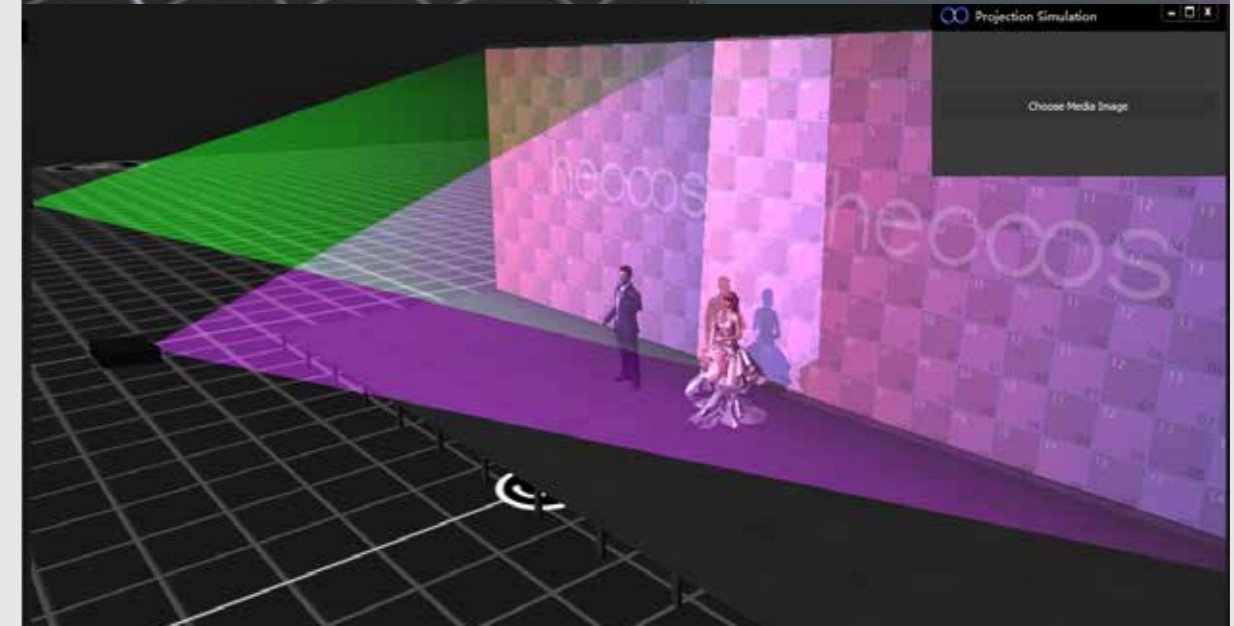
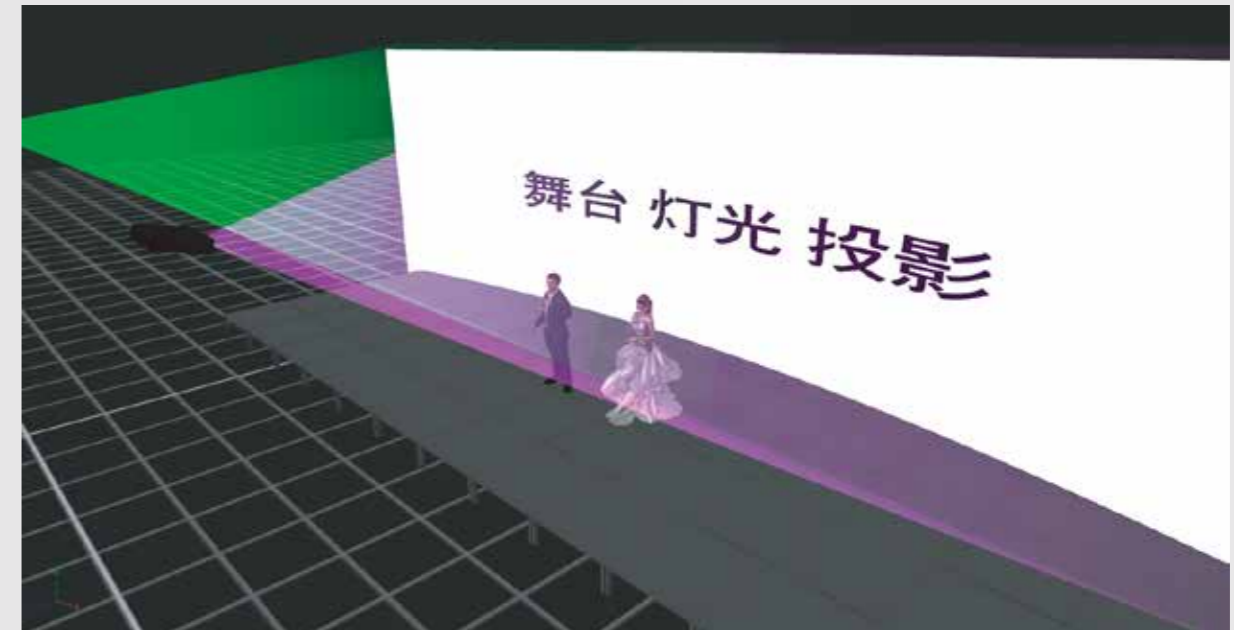
The parameter include color mode, brightness, resolution, grid size, serial number, circle radius, dot radius, diagonal line width, custom test, etc.



Projection simulation

This tool is used to simulate blockage of lighting path of objects and light distortion on objects in an actual situation.

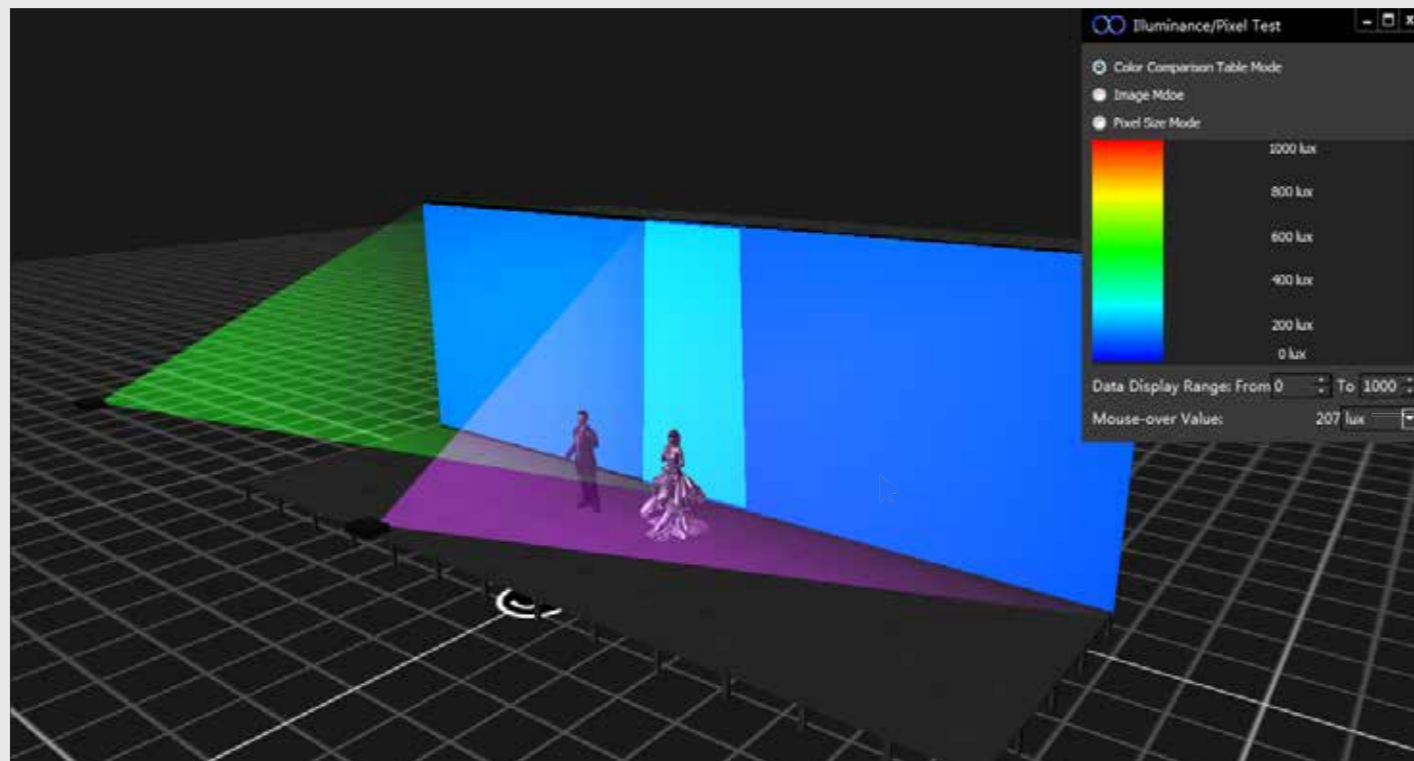
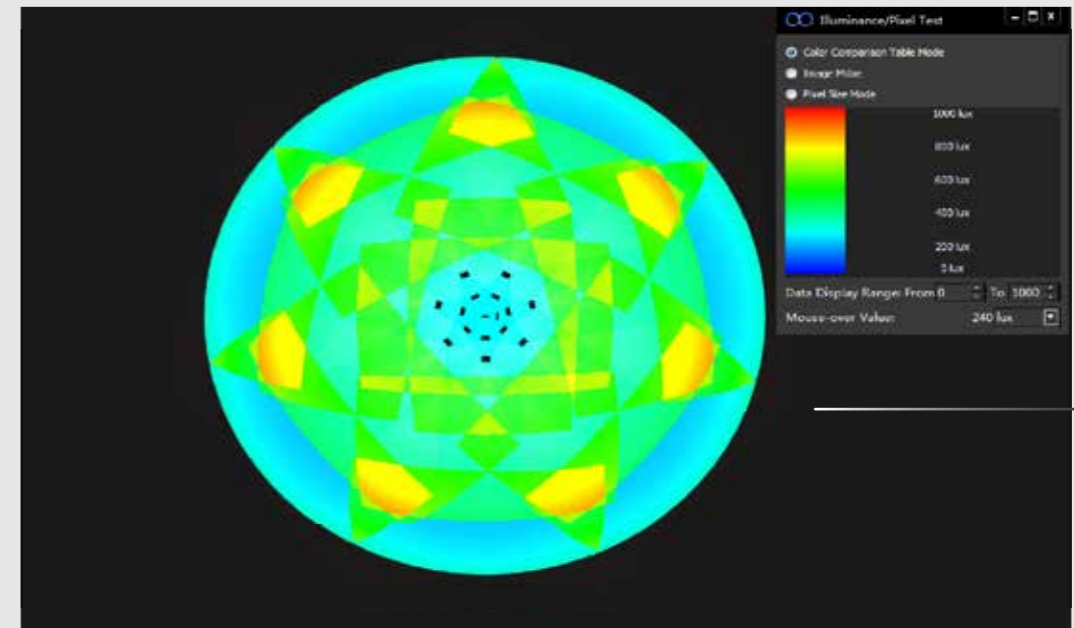
The images below show the function of the projection simulation. (Top image shows mapping media to display surface Bottom image shows projection simulation in this situation.)



f. Menu---Tools part 2

illuminance and pixel test

This tool is used to visualize the data including surface illuminance (lumen), pre-fusion image, pixel size (grain), especially in lighting path design. It's a particular function about hecoos, that use most directly color and data to simulate projection data in the actual stage. This greatly reduced the experience requirement in aesthetic conception and uncertainty.

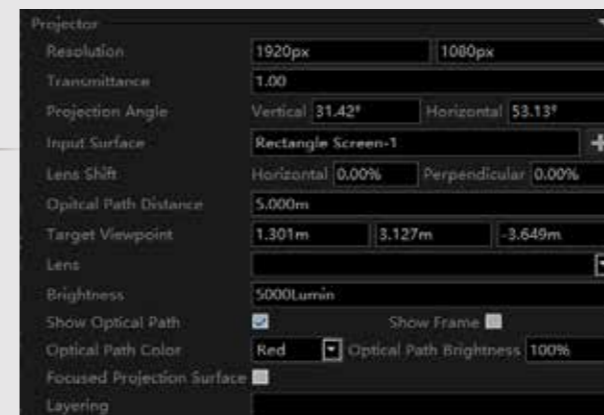


To use illuminance test, choose a projector and add the target display surface as input surface;

Open illuminance test to see the detailed relationship of projector and display surface;

Move the mouse on the display surface to see the value of illuminance;

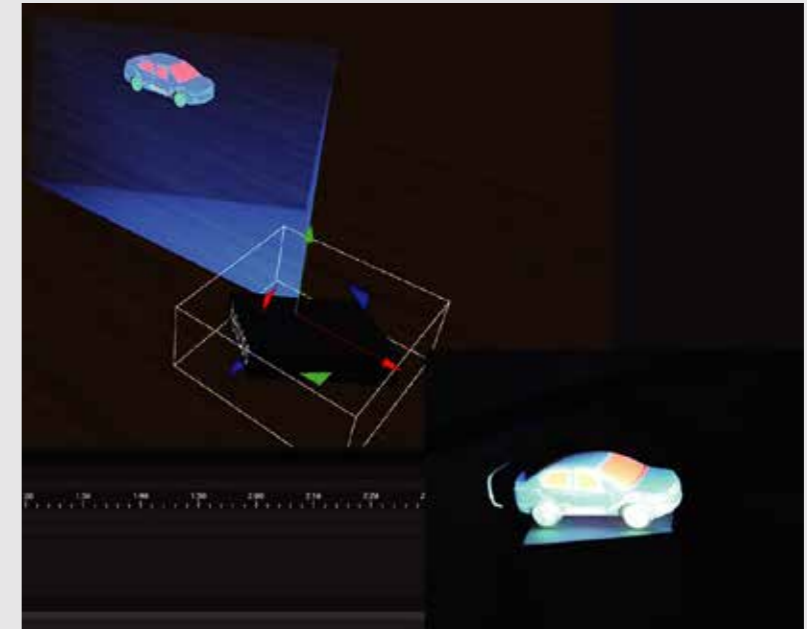
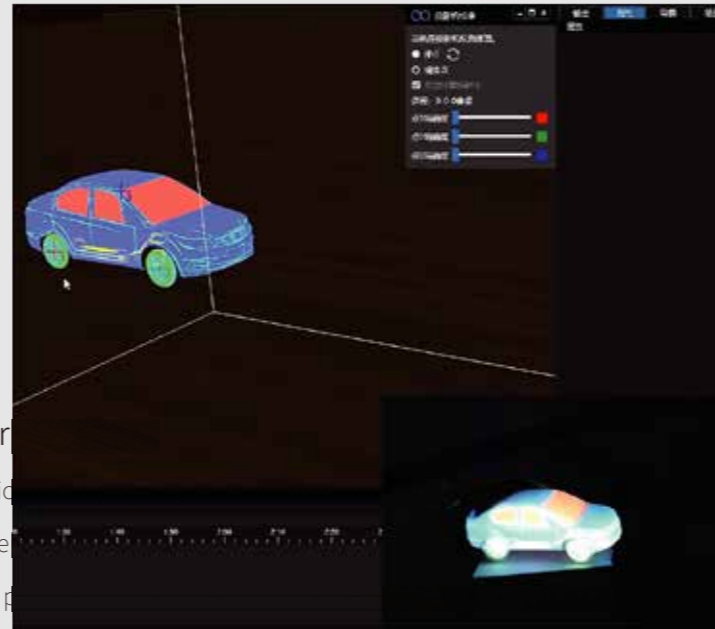
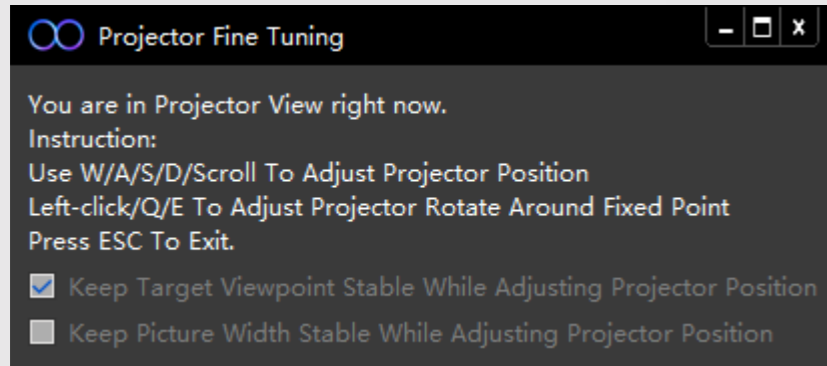
Tip: In dark environment, 200lux is capable for illuminance



Projector fine-tuning

Use keyboard and mouse to adjust projector position in software. By comparing the reference point position in hecoos software and actual scene, back calculate the

position of projector in software. Use input surface function to output the media to project surface. The back-calculation engine replaced the normal mesh adjustment, greatly improved alignment efficiency.



Choose projector

Use mouse to dynamically adjust projector position within the input surface.

In position mode, the projector will automatically absorb the display surface during projector move.

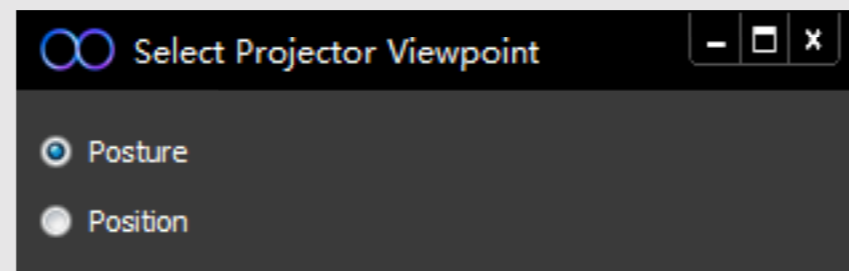
In posture mode, the position of the projector and light path distance are settled. The

projector will automatically absorb the display surface during projector move.

Arrange point: Click on the model to set reference point (3-6 reference points)

Edit point: Drag reference point and observe if the map is still on the correct position;

Fine-tuning: Use arrow key to do fine tuning;



face;

image(bitmap);

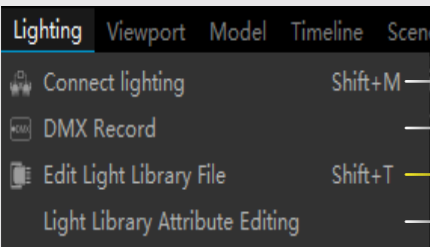
hecoos should be as same as the actual situation;

projector for mapping, and output image

that arranging point and editing

Introduction of Lighting

hecoos supports to adapt lighting (e.g. beam light) which added into the stage to the light library. It can be connected to the light console after an adaption, directly simulate actual lighting, carry on effect rehearsals in the software.



g. Menu---Lighting

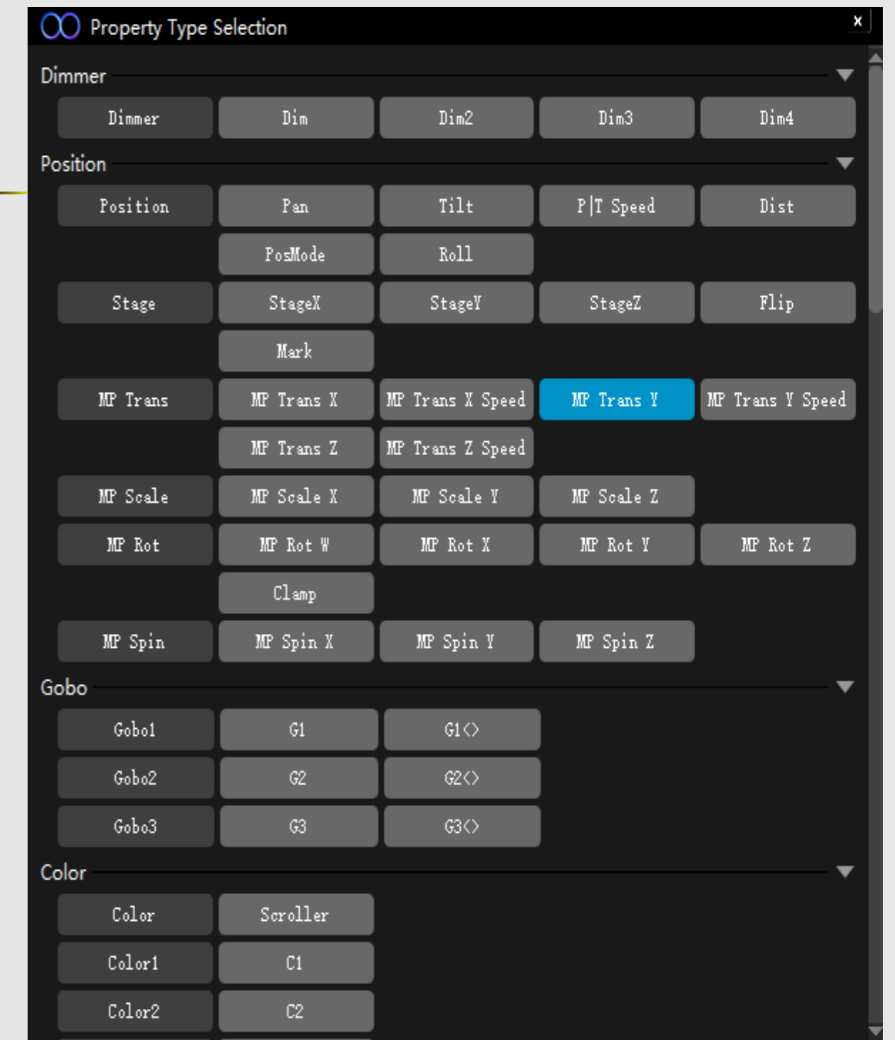
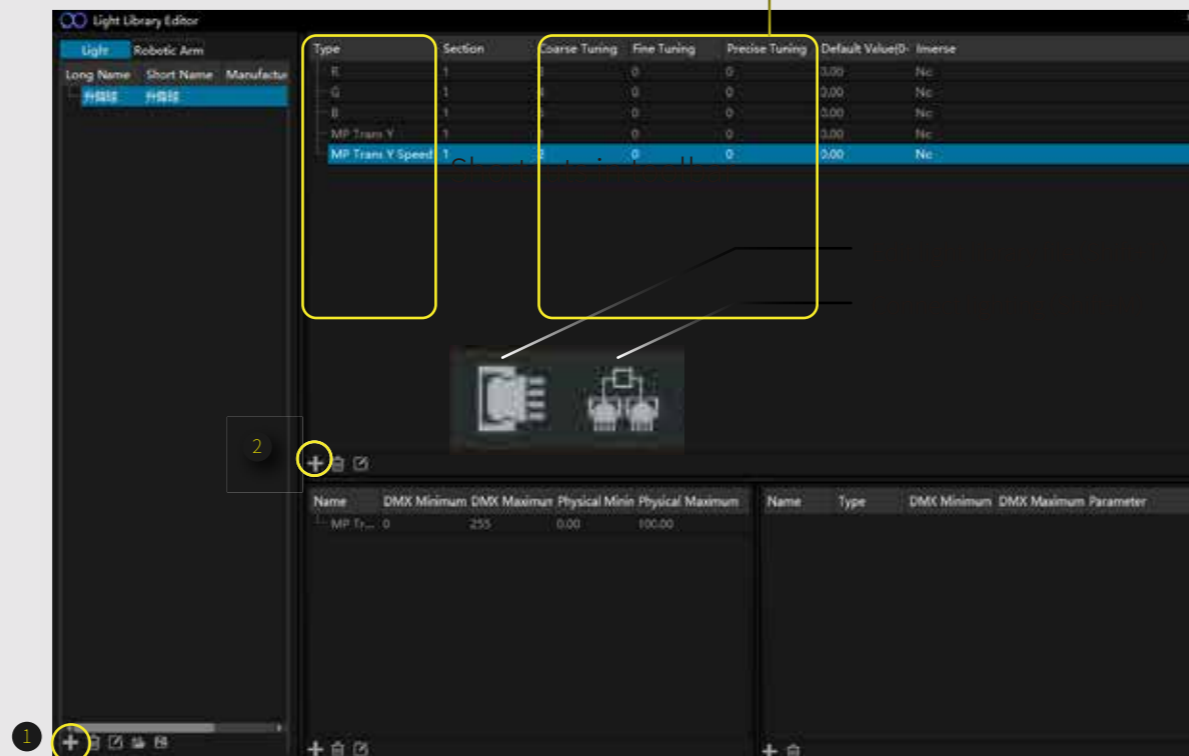
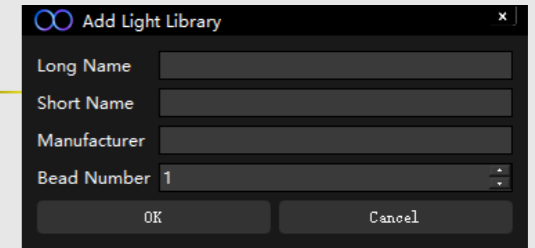
About light library

The lighting property, covers color, brightness, strobe, owns its library information, which includes the DMX512 channel information that can control the lighting. The content of light library varies based on different fixture type.

The hecoos supports editing, importing, exporting for lighting library files.

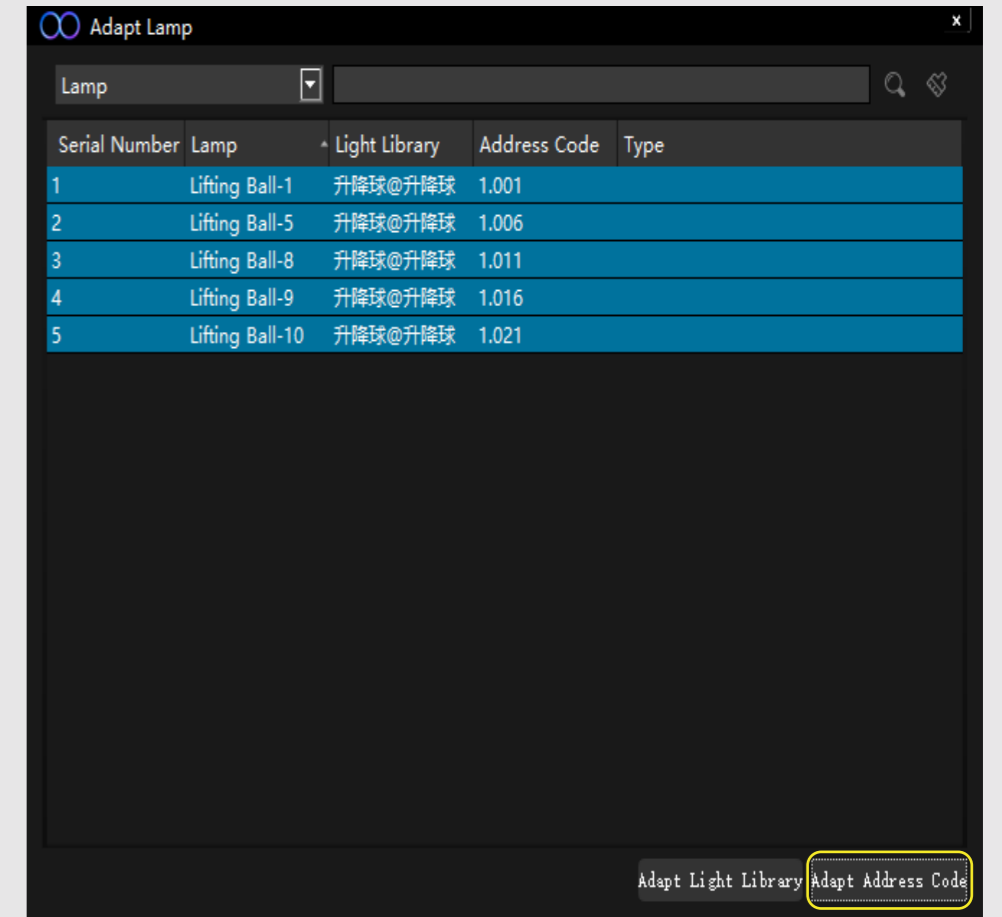
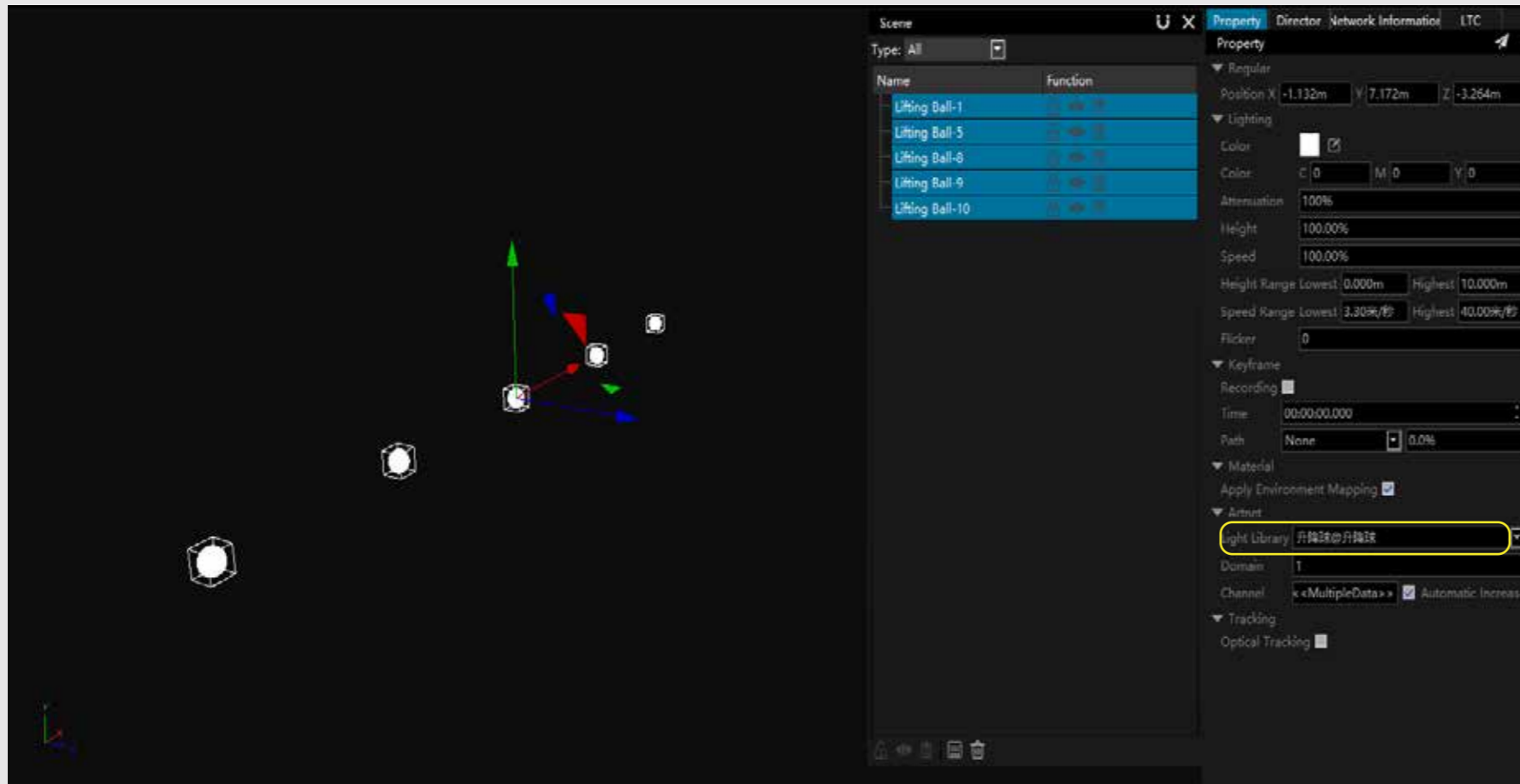
Edit light library

- I. Choose "Edit light library file", open "Light library editor";
- II. Click on **+** below the library, open "add light library" window, enter the fixture information then choose ok;
- III. Click on **+** below property window, open "property type selection" window, select properties according to its function.
- IV. Adjust channel value, the value increase from "1"



Adapt light library

- I. Create a lighting array, set the quantity and volume in the property window.;
- II. Release the lighting array, select the fixture in the group, change the light library in property window;
- III. Choose "connect lighting" in lighting menu, open "Adapt lighting" window;
- IV. Select the fixture that acquires address code, click on "Adapt address code", the system will adapt them automatically.



(For more information about set up array and group, please check "m.Array&Mirror&Group")

h. Menu---Viewport

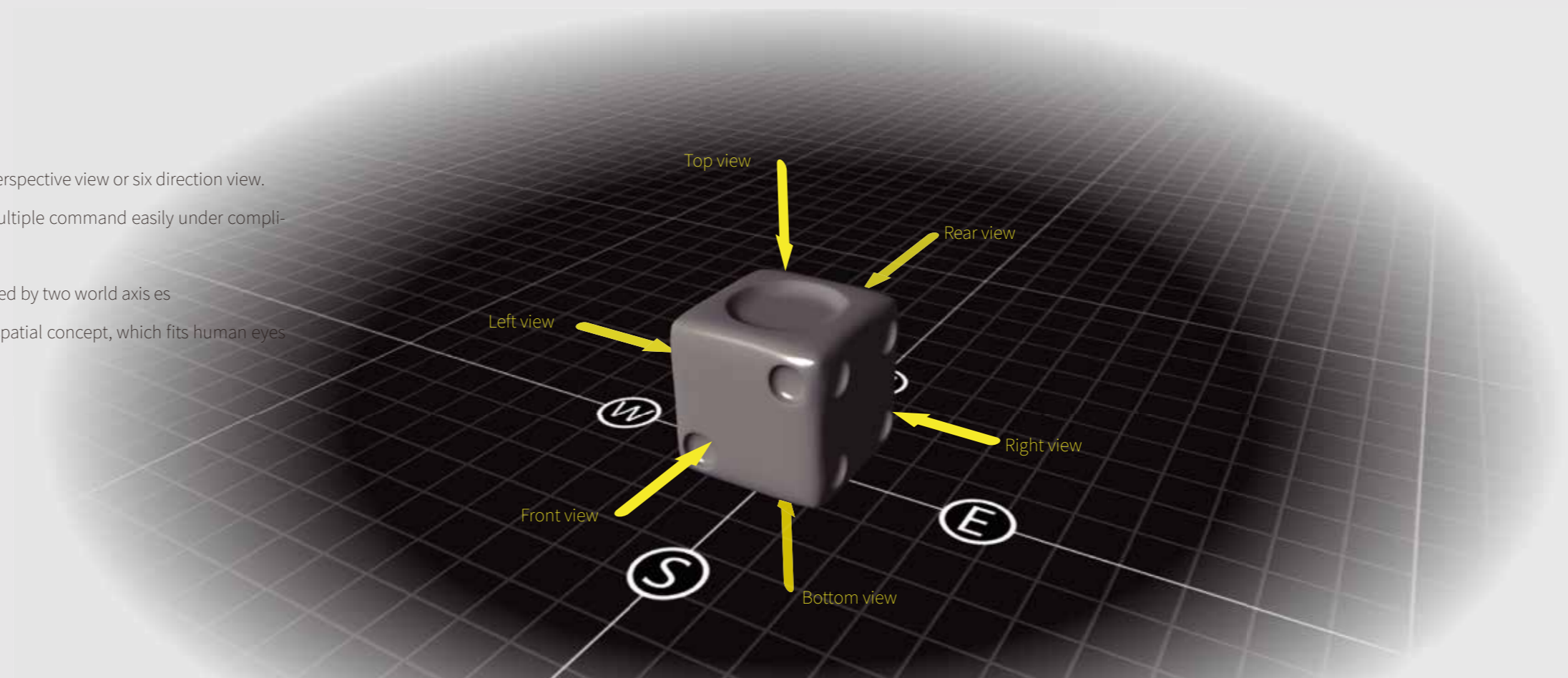
The purpose of using viewprt

In a three-dimensional scene, the space is displayed by perspective view or six direction view.

The purpose of switching different views is to achieve multiple command easily under complicated situation.

Orthometric views are two-dimensional views, each defined by two world axis es

Compared to orthogonal view, perspective view has the spatial concept, which fits human eyes better.



Switch between orthogonal and perspective

Switch between six direction views

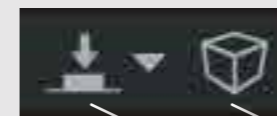
Show grid in viewport

Show FPS on top-right corner

Perspective view through selected object

Viewport	Model	Timeline	Scene	Director
Switch To Orthogonal View				Ctrl+M
View				
Ground Grid				G
Show FPS				
Perspective				Ctrl+L

Shortcuts in toolbar



Grid (G)

ShowFPS

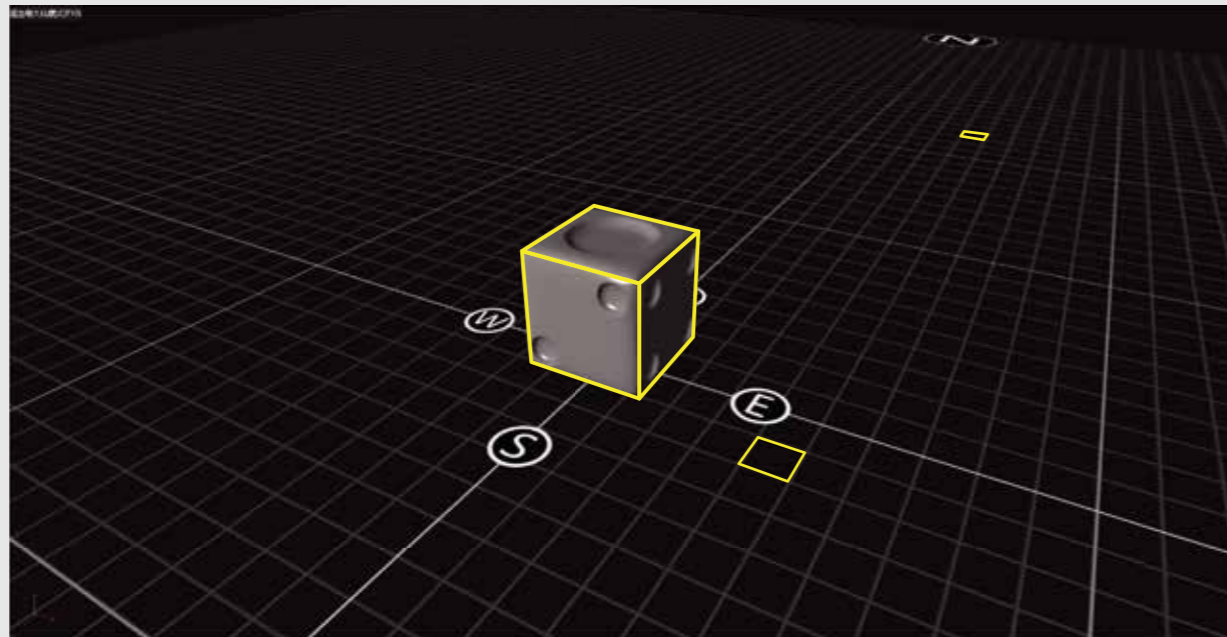
View

Orthogonal view (Ctrl+M)

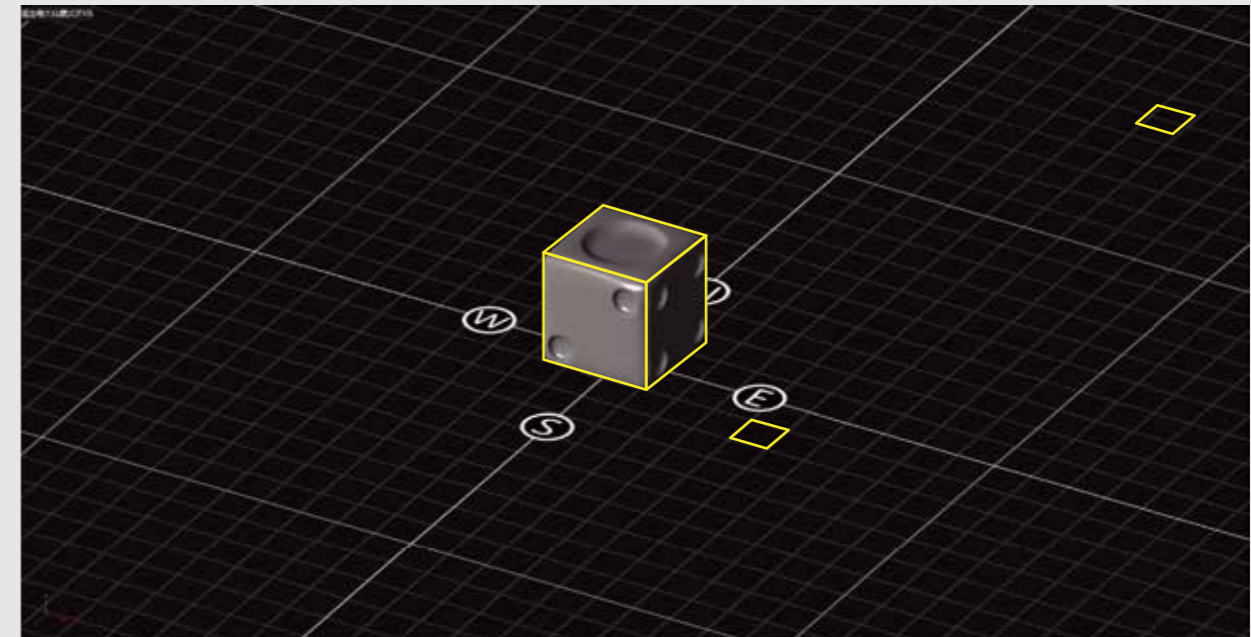
Perspective and orthogonal View

Compared to perspective view, orthogonal view combined with six direction view will make it easily and precisely to adjust the position of devices.

A perspective view is a view with a near-large and small perspective relationship, and an orthogonal view shows the same distance in the same size regardless of the spatial position.



Perspective View



Orthogonal view

Show FPS

Show frame per second on the top right corner in stage window

The picture will become choppy while fps decreasing, especially under 23 fps. You can set picture rendering quality in "File—setting—regular) to improve picture fluency.

```
FPS: 50
Triangles: 69510
Batches: 12
AV Diff: 0
```

i. Menu---Model & Import model and media material

hecoos supports import models as editable device or display surface for project using. hecoos will keep updating models and tools to resource center, such as brand projectors, lighting devices, geometry cubes and machinery.

! In V1.4.11 onwards, hecoos supports model auto optimization, which increase the running speed and release the calculation for server.

! In V1.4.11 onwards, hecoos supports *.skp file for importing.

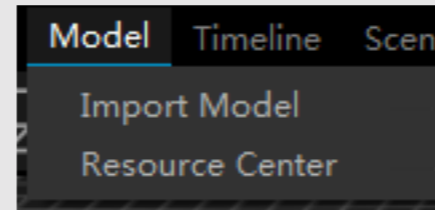
Import Model

First of all, it must be made clear that hecoos cannot edit the complex contents of the surface, materials, uv diagrams, etc. of the imported model. The editable elements are including position, scale, rotation and display surface projection content.

Secondly, the purpose of the import model should be determined, which is broadly divided into ordinary models (walls, ground shapes, masks, etc.) and display surfaces (complex surfaces that require projection, etc.)

Finally, if you can not complete the rehearsal, import or stage construction according to the needs, please check the following frequently issues:

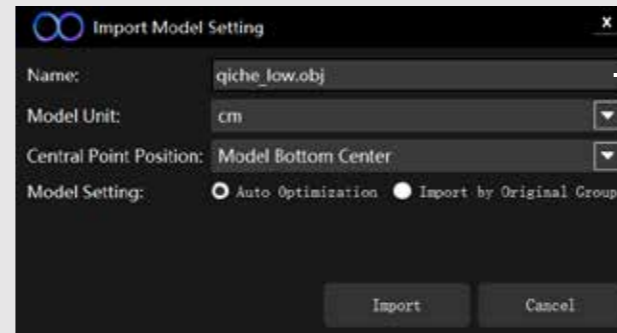
- i. The file format selected should be *.obj
- ii. For now, hecoos only supports basic material to import. If you find the material loss during the importing process, please bake the material in 3D software first and import again.
- iii. The required display surface model has a properly expanded uv
- iv. Due to software compatibility and stability considerations, the imported model should optimize and reduce the number of triangles
- v. If the model surface becomes transparent (e.g. the cut semi-sphere inner surface), the normal needs to be re-adjusted in the modeling software (flip normal) or set thickness of the model.
- vi. Import model is only to record the model path in the library, please ensure that the original path model file does not change. If you have to change the path, please pack the project in case of data loss.



Import built model file (support *.obj, *.3ds, *.skp)

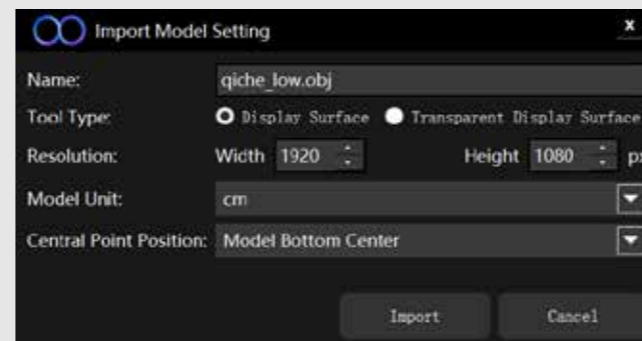
hecoos resource center. You can download online models for your project.

Right click on custom tools to import model



The name can also be edit in tool tab

Import every layer as individual model to hecoos.



For 3D Mapping application, please make sure that the model has correct UV

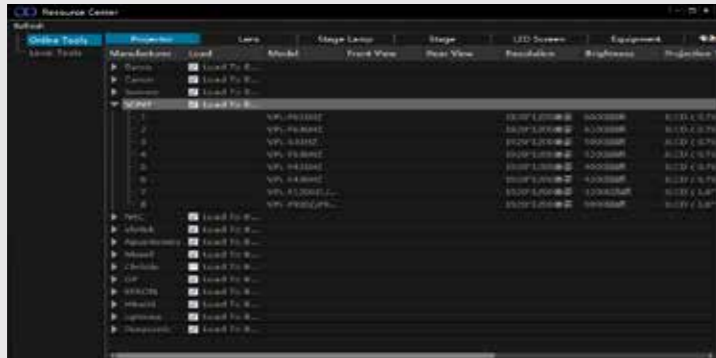
Please enter the resolution for the media that used for mapping

Resource center

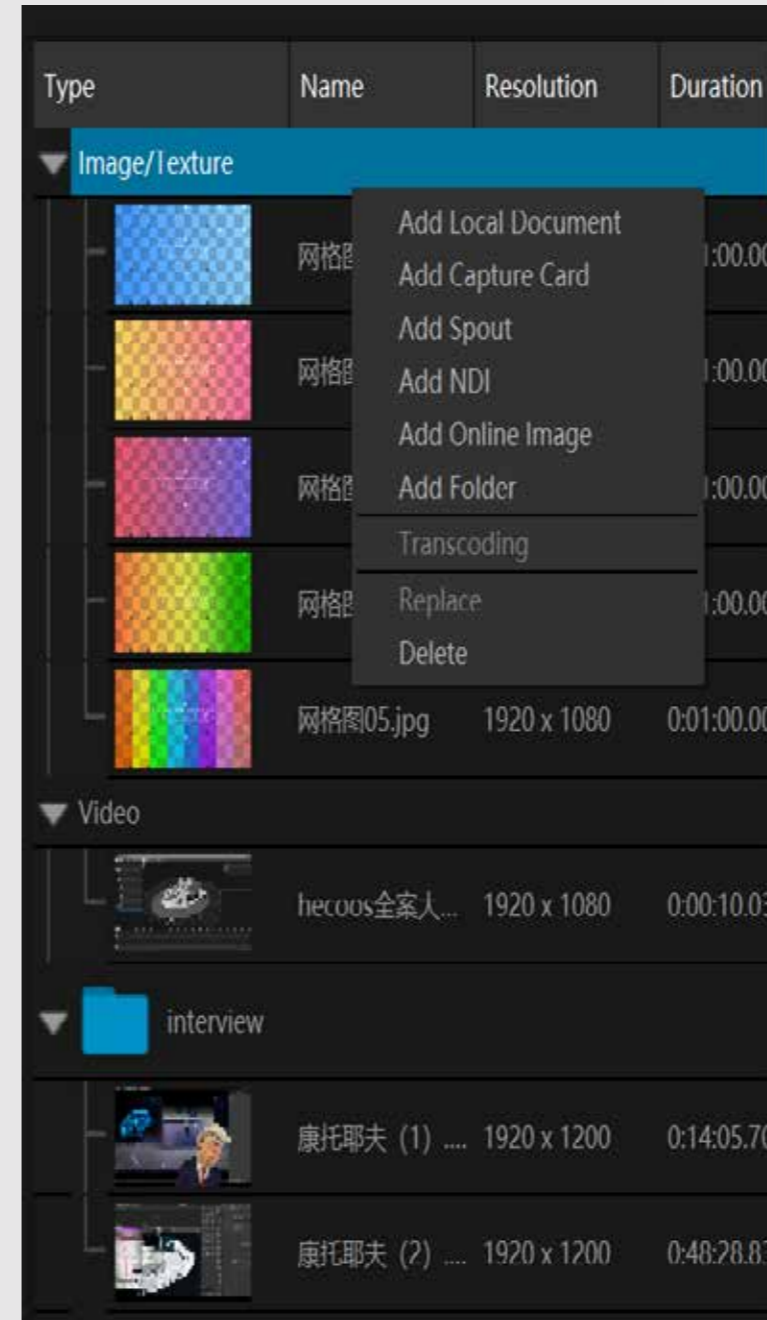
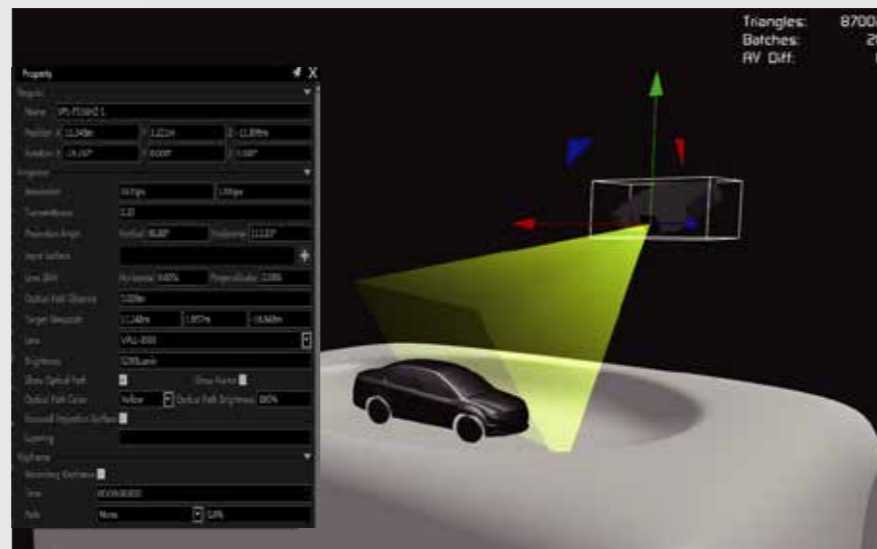
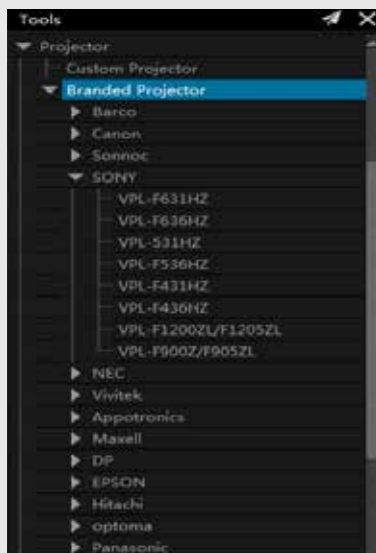
hecoos are actively working with suppliers to obtain parameter data for a variety of equipment. A variety of mainstream brand projectors, lenses and other data have been opened to members to increase the possibilities for creative rehearsals

How to add brand projectors

Check the brand projector in resource center, it will be added in tool tab---projector---brand projector.



The projector that can be called.



Add media material

Support for most formats of media files to hecoos for rehearsal.

Also support the capture card, Spout and NDI .

Manage media materials by creating folders.

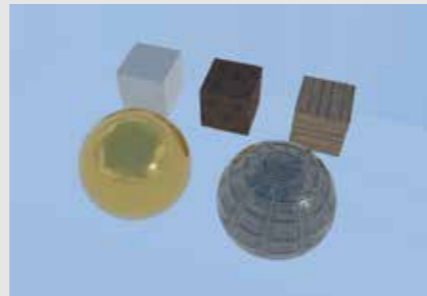
Build-in codex for transcoding , improve the playing fluency.

j. Material System

hecoos supports to attach the built-in material to models,

The built-up of hecoos material is by 4 or more layers of texture.

The basic parameters of texture include color, diffusion reflection texture, metallic texture, roughness texture, normal texture, etc.



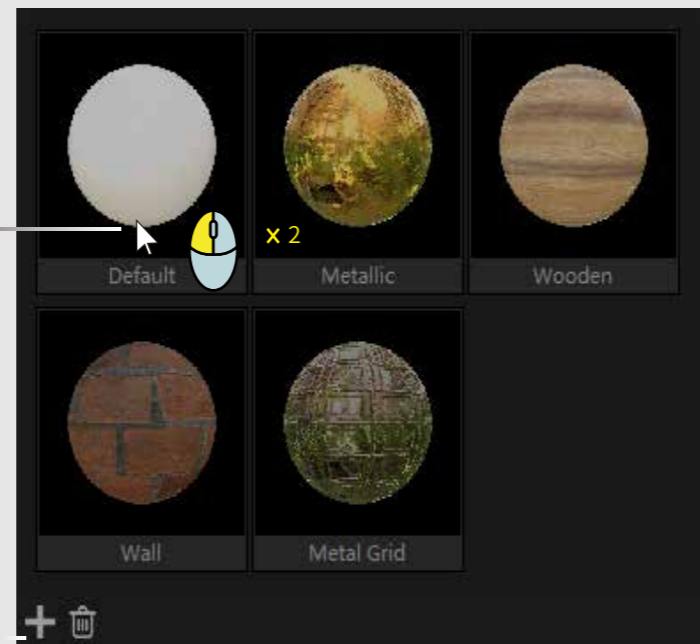
Procedure

Attach material: In viewport, choose target object and double-click on the material to attach.

Custom material: Click on "+" to add new material

Edit material: Click on material while unselecting any object (only works on custom material), you can edit the parameter include name/ diffusion reflection color/ diffusion reflection texture/metallicity/roughness/normal texture/AO texture/self-illumination color/self-illumination texture/opacity/environment light reflection/highlight in property tab. Double click on texture to load new texture mapping.

Double-click on material to attach it to the object.



New material/ delete current material

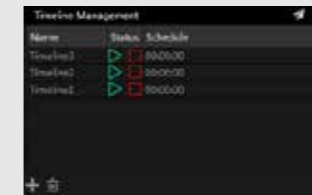
Regular	▼	
Name	Metallic	Name
Material	▼	
Diffuse Reflection Color	R 255 G 255 B 255	Affect diffuse reflection texture hue
Diffusion Reflection Texture	[Yellow texture]	Basic texture mapping for material
Metallicity	1.00	Affect metallic luster gain
Metallicity Texture	[White texture]	Affect metallic luster texture type
Roughness	1.00	Affect roughness gain
Roughness Texture	[Dark texture]	Affect roughness texture type
Normal Texture	[Blue texture]	Affect display bump mapping
AO Texture	1.00	Affect AO texture gain
AO Texture	[White texture]	Environmental shelter
Self-Illumination	<input type="checkbox"/>	Self-illumination switch
Color	R 0 G 0 B 0	Self-illumination color
Self-Illumination Texture	<input type="checkbox"/>	Self-illumination texture
Self-Illumination Texture	None	
Opacity	1.00	Opacity
Environment Light Reflection	<input checked="" type="checkbox"/>	To show surrounding reflection
Highlight	<input checked="" type="checkbox"/>	Highlight

k. Timeline

The purpose of timeline

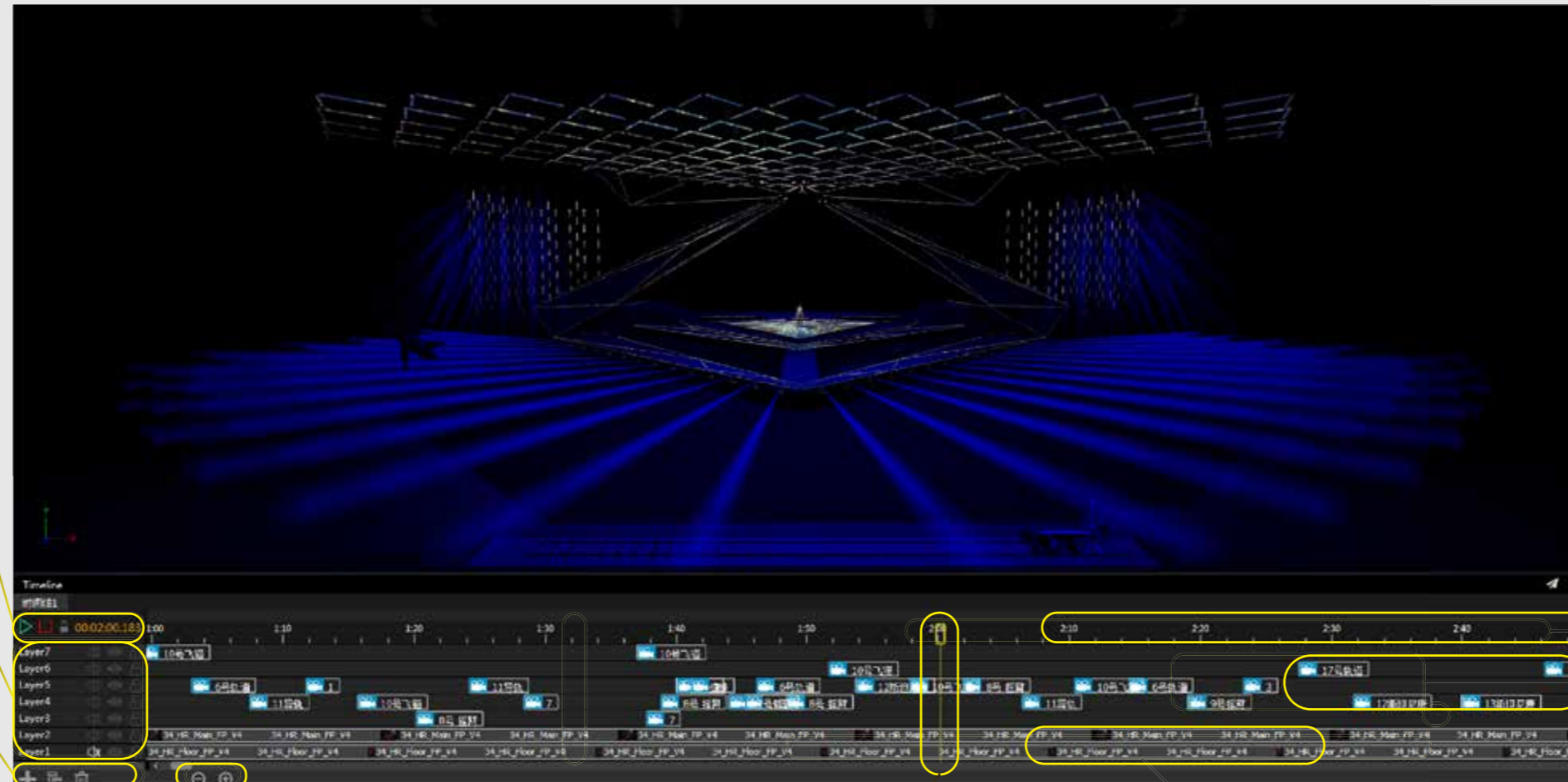
As a 3D software, hecoos combines powerful spatial simulation with excellent time management.

When we need to manipulate media material at a specific time or add automatic playback instructions, the power and stability of the timeline function is a powerful support for the overall design effectiveness.



Timeline management

Achieve control multiple timelines at different time node, also support the return and synchronization of timeline/time node data from the third party, make the editing process for complex layers in timeline easily.



Play/pause media on cursor, stop playing, lock/unlock all layer, current time

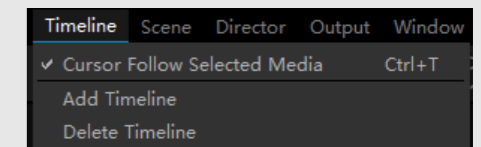
Timeline layer, control mute/unmute, hide/show, lock/unlock for the layers

Add new layer on the top/ insert layer beneath selected layer/delete selected layer

Scale Timeline

Cursor

Media material



You can set the following status for timeline cursor.

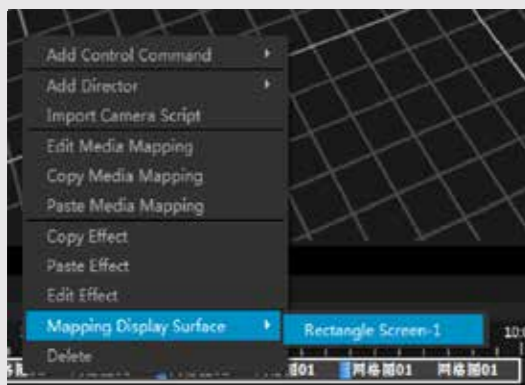
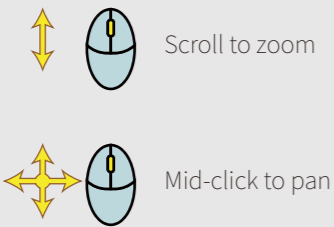
Timeline
Director command
(Enter cama)

I. Media Mapping & Slice

Media mapping

Project video, pictures, or other media material to the display surface for play, jump, crop, and other operational instructions with timeline management

Double-click the media file on the timeline to call up the media mapping window, select the display surface that needs to be mapped in the list of display surfaces, and drag media material by holding down the Shift key to the display surface of the display surface mapping media distribution area. Complete the full version mapping instruction for the media (using the Alt key mapping effect to project point-to-point by the number of points of the original media pixel to the display surface)



Tips: Right click on timeline media to open shortcut menu, choose the mapping surface to map the media (equivalent of using shift key)

Media name/Media resolution

Display surface/media slice management

display surface list

current mapping slice

Rotate knob

Rectangle/polygon slice tool

Display surface mapping media area

Display surface media name/resolution

Rotate knob

Add a group of display surface

Edit selected group

Delete selected group

Hint: Quickly Add Slice Method(Shift+Left-click To Drag Program To Display Surface, Program Slice Full-Screen; Alt+Left-click To Drag Program To Display Surface, Program Slice Keep Same Ratio)

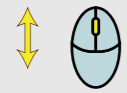
Slice

The slice can achieve the need to cut from existing media material on demand to meet the needs of a picture.

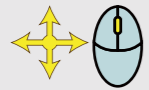
Share the same timeline and other edits with the original media material.

Slices are only available for visual capture.

Drag slice to corresponding display surface by holding shift/alt key.



Scroll to zoom



Mid-click to pan


Rectangle slice 

Use surrounding anchor to adjust size

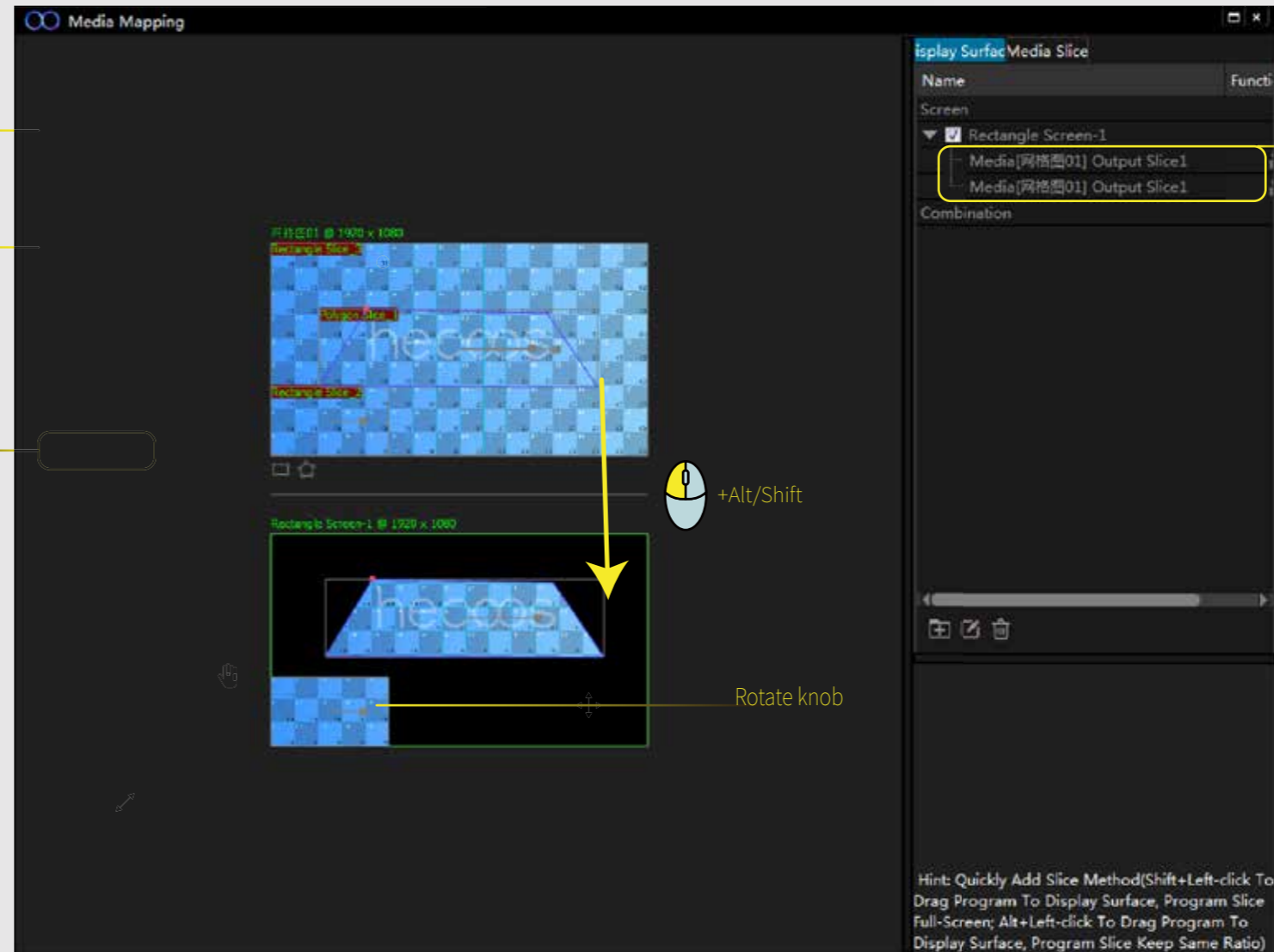
Polygon slice 

A custom shaped slice by surrounded with a polyline

Use hand tool to change anchor position 

Use arrow to scale on specific direction 

Use cross to move slice on source or surface 



Display surface group

It is possible to combine multiple display surface into a new one. It will be considered as a whole display surface in media mapping tab, used for display one media material on multiple screen (open/close screen)

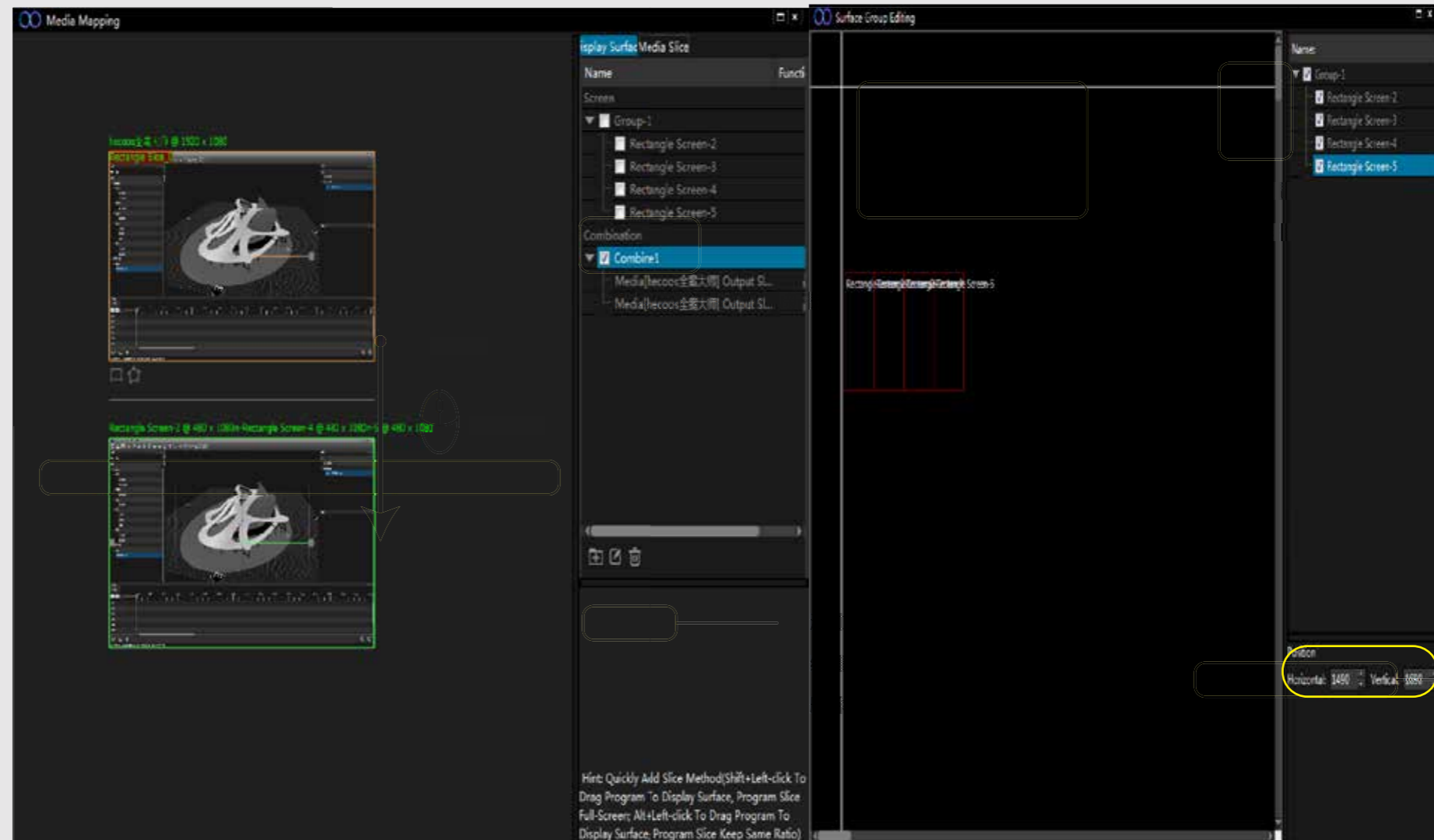


Grouped display surface

Every display surface can follow move/rotate/keyframe animation command individually

Procedure

- Add a display surface group
- Find and check the surfaces that need to be grouped
- Arrange the surfaces in group editing tab
- Check the new group
- Map the media on the group



Type in coordinate to set precisely

m. Array&Mirror&Group

The purpose of edit stack

When building a stage scene, there are often required to create new combination by duplicate simple tools, such as layer racks, lighting devices or table and chairs. In this situation, creating array/mirror/group will fulfill the requirement.

Array

Divide into regular array and ring array

Regular array will duplicate object on x/y/z axes

Ring array will duplicate object on a virtual ring

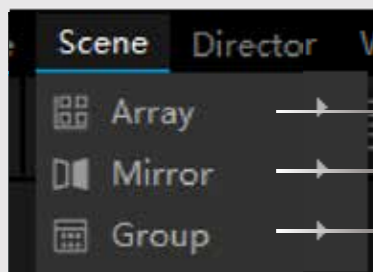
Shortcuts in toolbar



Array

Mirror

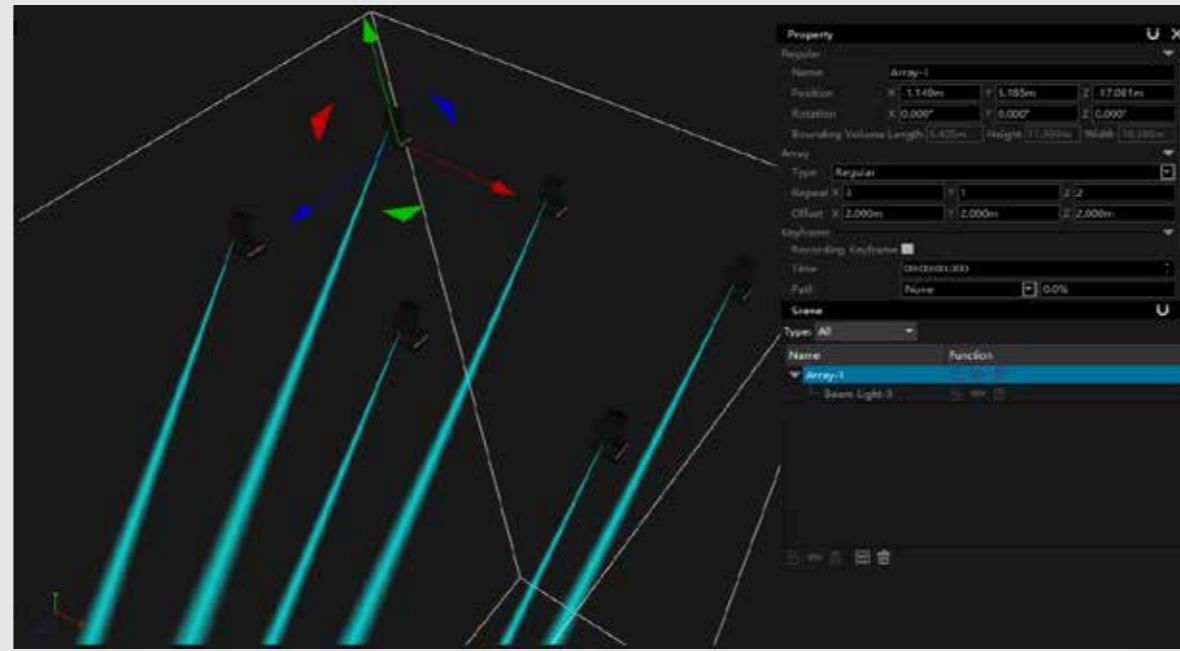
Shortcuts in Menu



Create array based on selected object

Mirror/unmirror based on selected object

Group/ungroup based on selected object

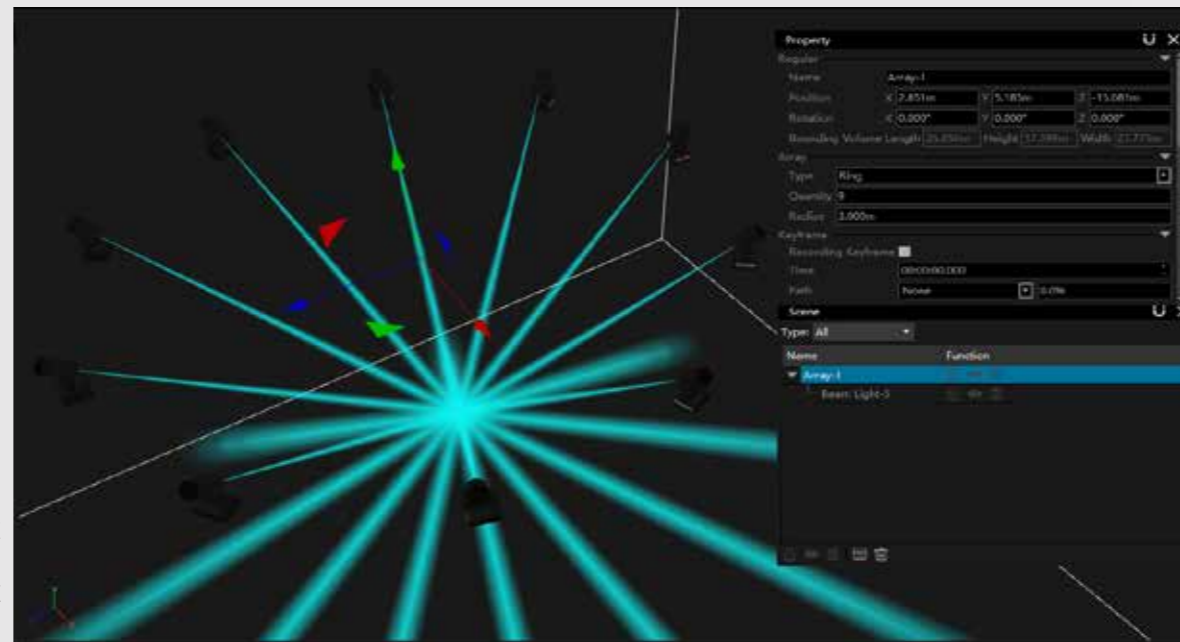


Different types of array

Adjust stack quantity on XYZ direction

Adjust offset to change intervals between objects

Set array function will apply on all individuals within the group

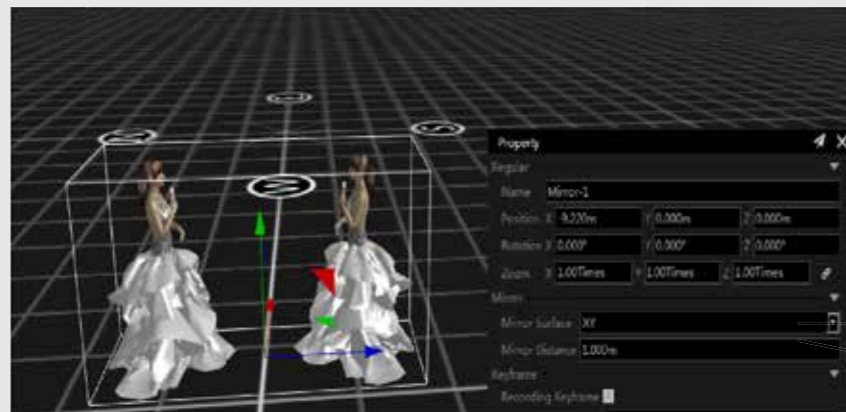


Quantity of objects on the ring

Radius of the virtual ring

Mirror

Duplicate selected model perpendicular to the mirror surface.



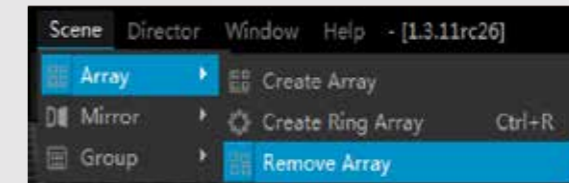
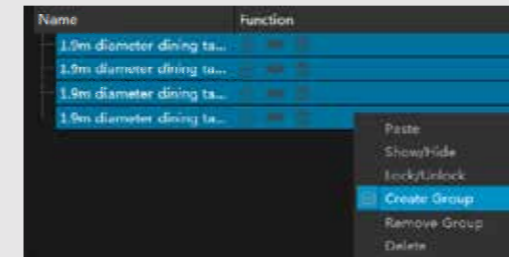
Mirror surface
Mirror distance

Remove

When you need to adjust the individual attributes in the array/mirror/group, you need to remove array/mirror/group

Select the array/mirror/group to be removed, right click and select Remove array/group/mirror

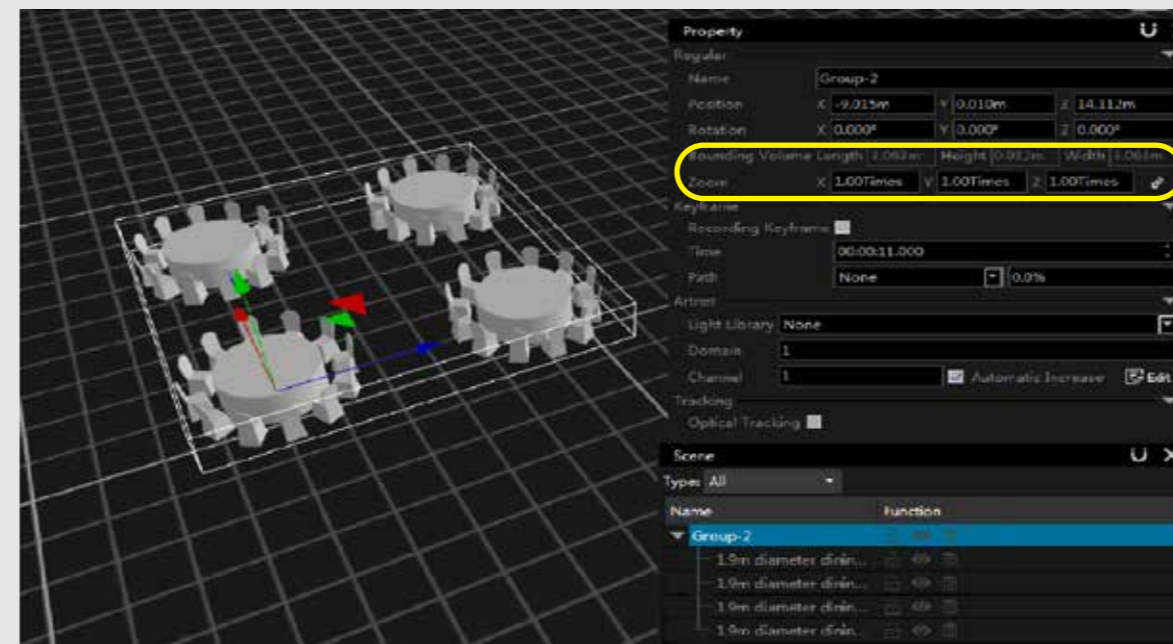
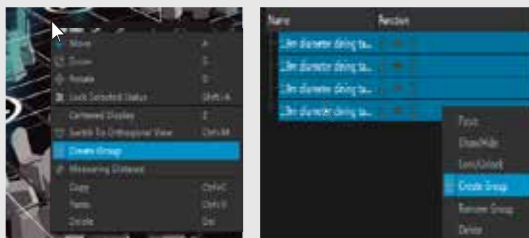
Once the array is removed, the devices in the array will automatically form a group. When the group is selected, the group can be set as a whole. Or release the group, the individual device can be individually adjusted.



Group

Combine multiple devices (allowing different devices to be grouped) into one group, which is convenient for selecting and performing operations such as moving and rotating. Group is an efficient management method for multi-level or multi-devices situation.

Tips: Select the devices that need to be grouped, right-click to open the shortcut menu, select Create Group; or right-click in the scene window to create a group



Use bounding volume to simulate occupy space
To scale by x/y/z direction

Set group function will apply on all individuals within the group

n. Interface & Window menu

Interface layout

Interface layout include menu bar, toolbar, left tab, right tab, stage area. You can attach the tool, media, director window to left/right tab, or drag it over the stage area.



Window

hecoos has many functions. Sometimes it does not necessarily to use all the functions.

Choose the window suitable for the project design, put the window in the right position

will improve the working efficiency.

Window	Help	-[1.4.11rc8]
Full Screen	F10	Hide all setting tab except menu bar
Reset Window		Reset all window position to the default layout
Save As Default Layout		Save current layout as the default layout
✓ Tools		Model tab
✓ Timeline Management		Timeline control tab
✓ Timeline		Timeline tab
✓ Media		To save image material and video material
✓ Output		To manage output through hecoos
✓ Property		To show the property window for the selected object
✓ Scene		The model list that you put in a stage
✓ Director		Camera management window
✓ Network Information		Network connection information
✓ Task		Set multiple task schedule
✓ Material		Built-in material system
✓ LTC		Linear timecode tab

Tools

You can import custom model or use imported/built-in model

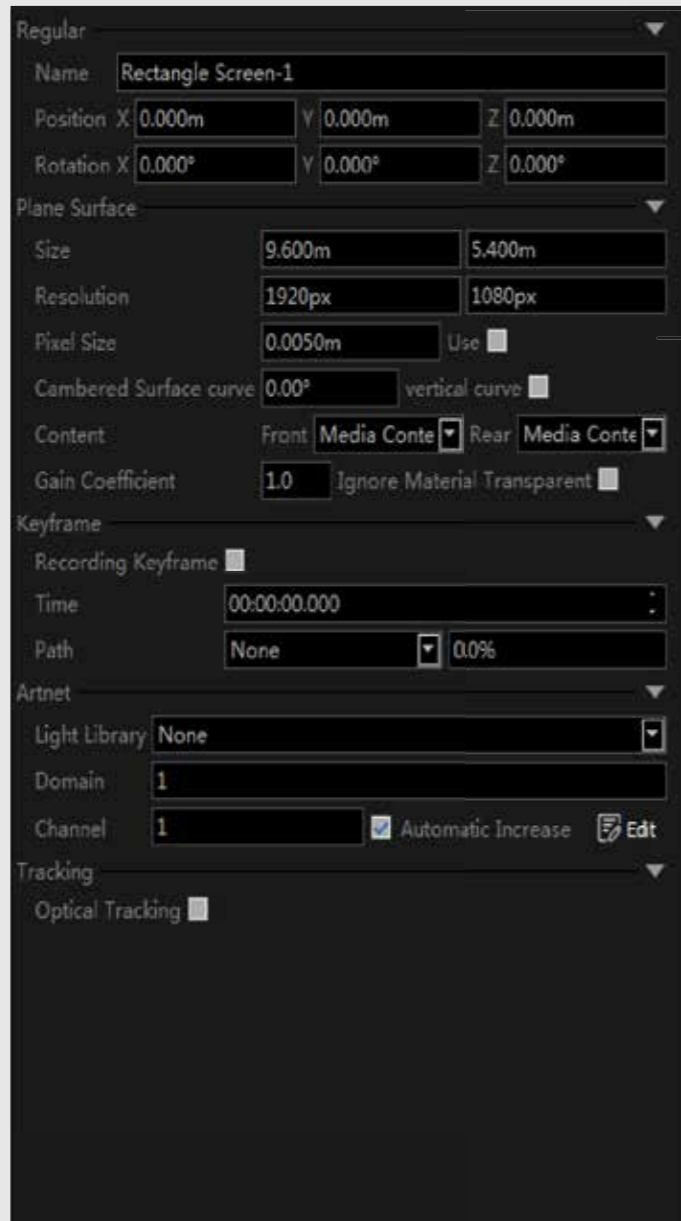
To use a model in viewport, double-click on the model (generate at the original point) or drag it into viewport (custom position)

Add custom tools/ open resource center/ delete tools

Tools	
Custom Tools	Imported custom model
Built-in Tools	Built-in model from hecoos software and loaded model from the resource center
▼ Projection	Output media to display surface through the projection method
Parallel Projection	Output the media to display screen in the same size from a certain space position
Perspective Projection	Output based on distance ratio from a certain space position to the screen
▼ Display Surface	The surface that can be output projection
Rectangle Transparent Screen	Rectangle translucent screen
Rectangle Screen	Rectangle screen
Other	Other screen, including multiple built-in shaped screens
▼ LED Screen	LED screen unit
P3.91 Screen	P3.91 LED screen
▼ Projector	A projector that its properties can be edited manually
Custom Projector	Projector with official parameters which for precise rehearsal scenario
Branded Projector	
▼ Camera	A camera that its properties can be edited manually and reposition freely
Custom Camera	To simulate actual tripod camera
Tripod Camera	
摇臂摄像机	
▼ Lamp	Editable beam light
Beam Light	Editable pattern light
Pattern Light	Editable washing light via light console
Washing Light	Editable lifting ball
Lifting Ball	
▶ Robotic Arm	
▼ 基本形状	Basic geometry cubes
长方体	
圆锥体	
圆柱体	
球体	
▼ Scene	Built-in scene
▶ Stage	Include multiple stadia/theater
▶ Character	6 built-in character model
▶ Nature	including rain/snow/flame rendering effect
▼ Properties	Built-in props
▶ Stage	Stage model
▶ Rack	7 types of the rack including Layher rack
▶ Voice Box	Two audio box display model
▶ Other	Desk/chair model

Property tab

Property tab is an essential window for setting quantitative data. It can be used for settings about tools, media, layers, scenes, and director.



Rectangle screen property

You can adjust properties for screens, including position, posture, size, resolution, pixel, etc. You can also simulate open/close screen by using keyframe animation.

Rectangle transparent screen property

Compared to the rectangle screen, the transparent screen can simulate ice screen effect. You can also set transparency to simulate various transparent screen in real-life.

Tips:

Please take care about size and resolution properties. (check 'use' for resolution back-calculation)

Universal projector property

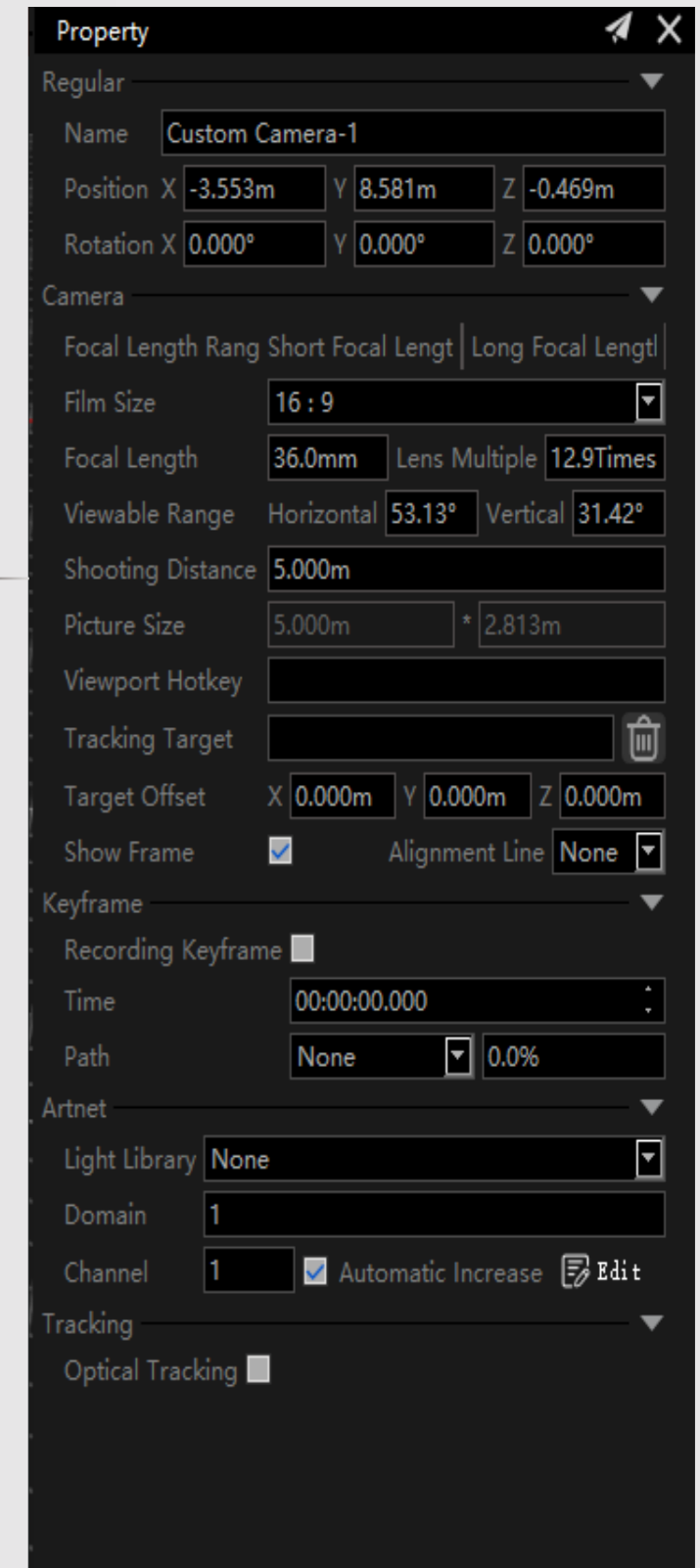
You can edit the property of the projector, including name, position, posture, size, resolution, etc. By making keyframe animation, you can simulate the motion of the projector moving in rehearsal.

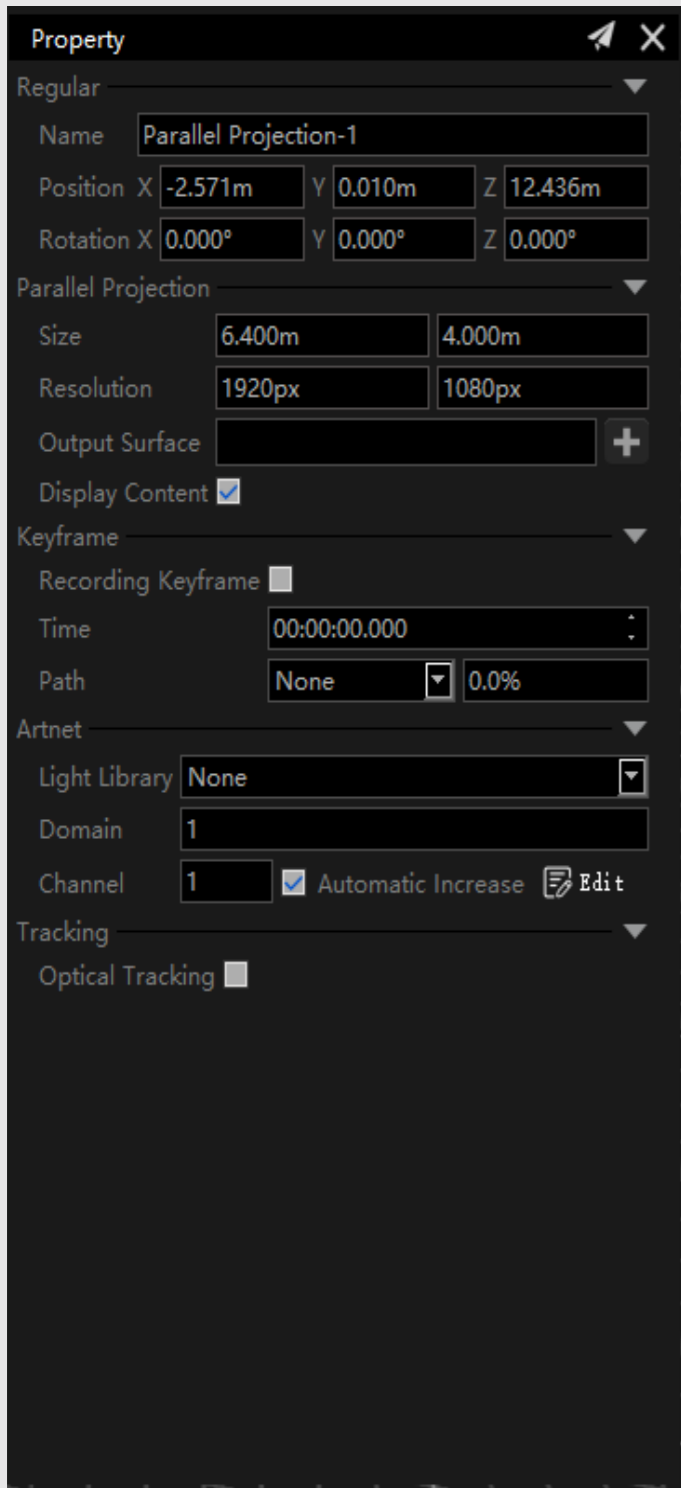
Branded projector property

Compared to the universal projector, branded projectors' parameter is authorized by the manufacturer, optimize designing and data collection

Tips:

When use projector to do light path designing, please choose input surface as relevant display surface to see the lux value.





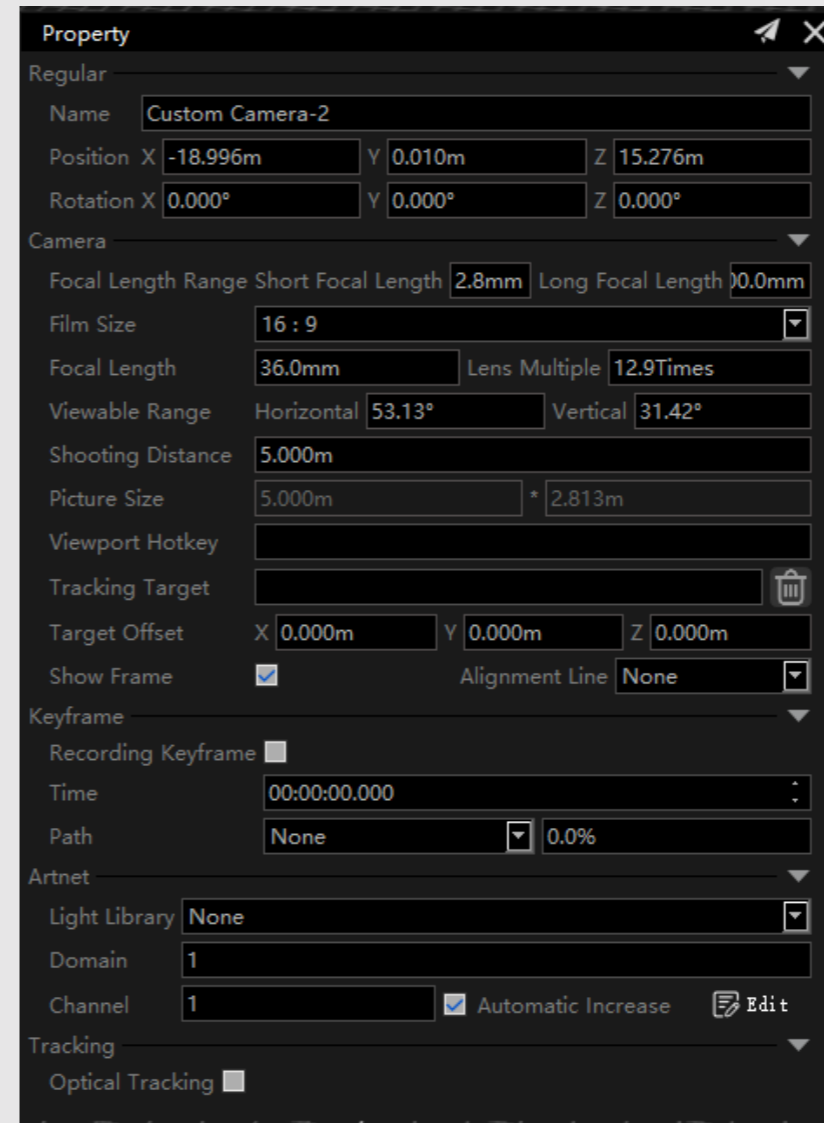
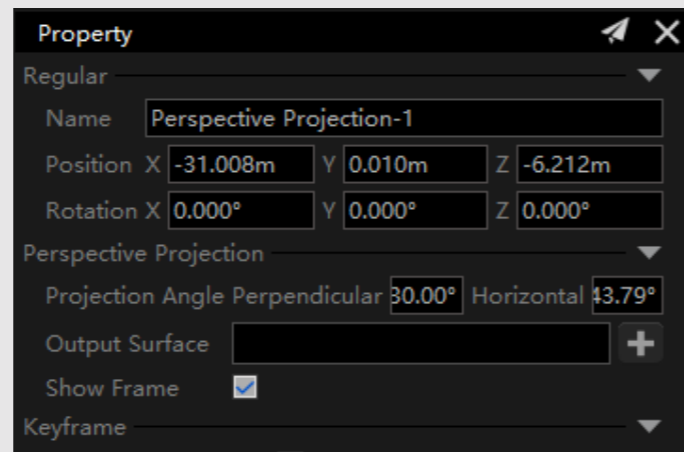
Parallel/transparent projection property

Parallel projection output the media to display screen in the same size from a certain space position. Transparent projection output the media to display screen based on distance ratio from a certain space position to the screen.

You can change the name, position, posture, size, resolution, output surface, etc. of projection. By making keyframe animation, you can simulate the changing of display picture in rehearsal.

Tips:

When use parallel/transparent projection, choose output surface as relevant display surface to relate mapping material. To use projection as the output source, please map the media resource to them first.



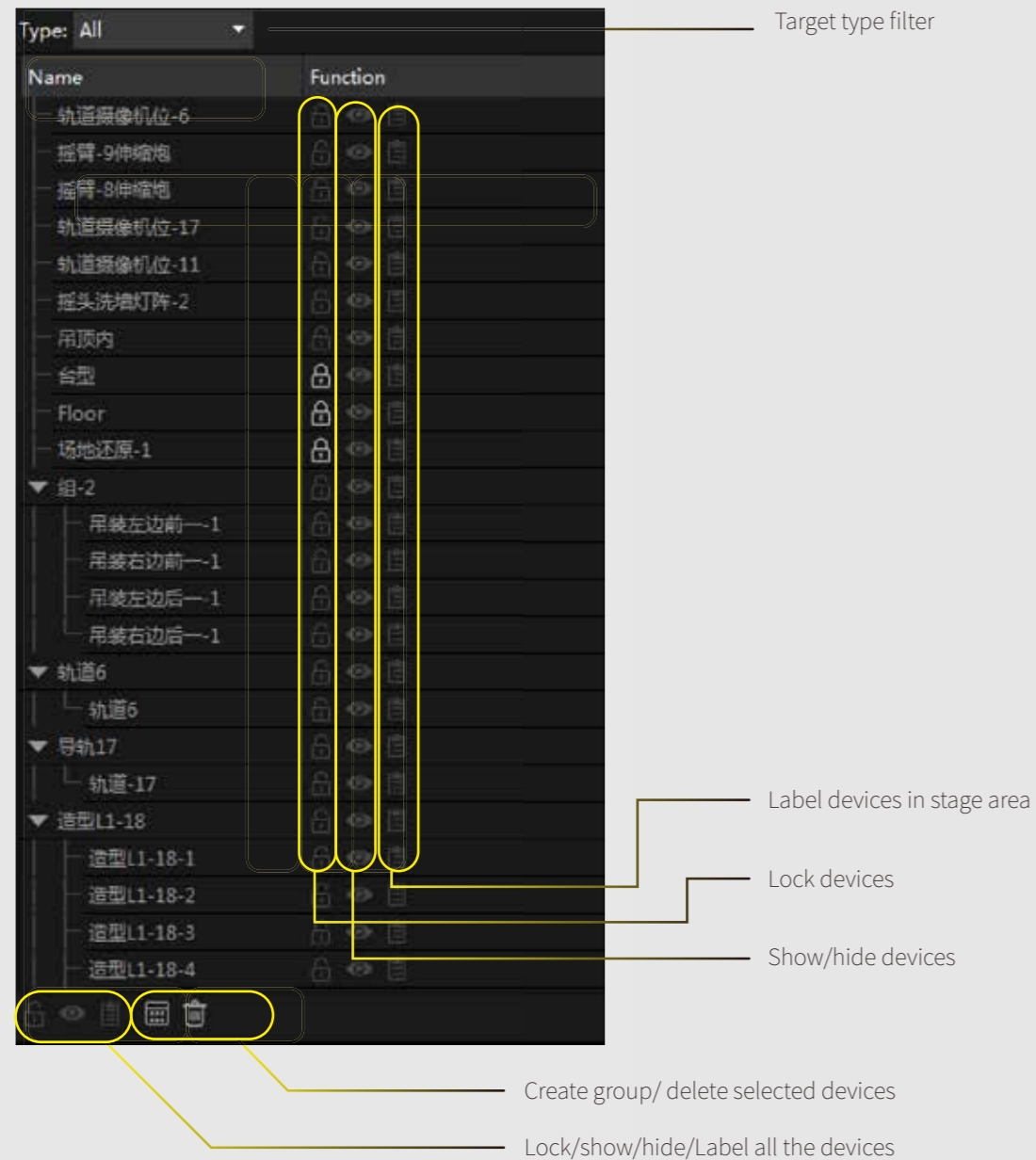
Camera property

You can edit the name, position, posture, focal position, film size, tracking target, etc. of the camera. By making keyframe animation, you can simulate the position motion of the camera in rehearsal, it's a critical application in director animation.

You can also add crane command to crane camera to simulate the actual situation.

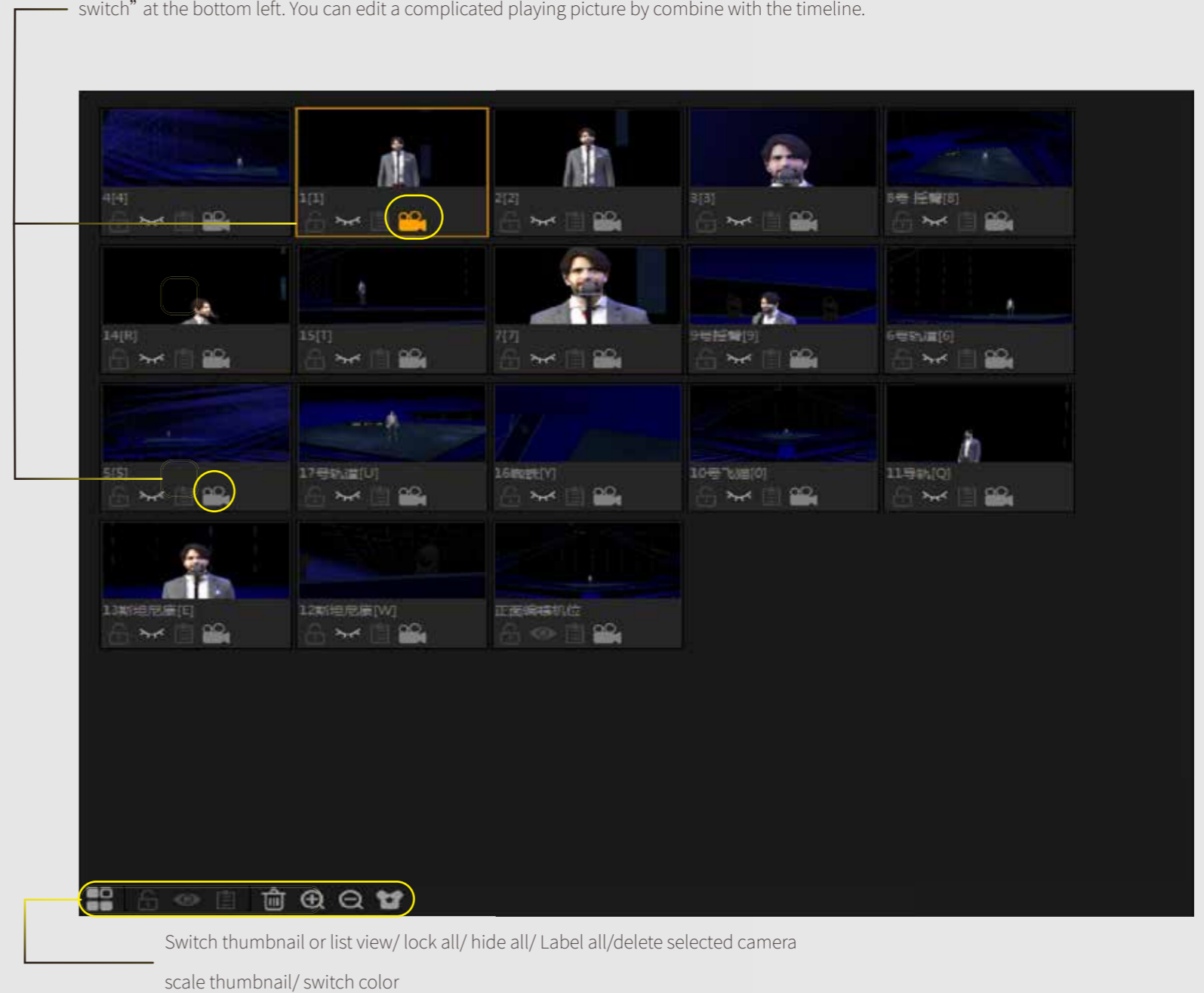
Scene

This is the tab that shows all tools used in the stage. You can select, lock, show/hide, labelling for any tools. You can also create group, array or mirror by right click on the tools.

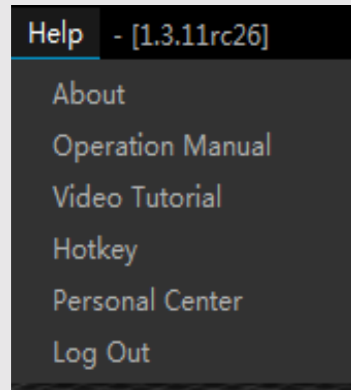


Director

This tab shows all the cameras on the stage. The director can switch different camera picture by click “view switch” at the bottom left. You can edit a complicated playing picture by combine with the timeline.



o. Menu---help



The help menu will aid the user to use hecoos software, include version information, membership, user guide and hotkeys.

About

Include version information



Hotkeys

Use hotkey to improve working efficiency, offer other three kinds of hotkey settings for different operation habits.

Function	hecoos	Cinema4D	3ds Max	Maya
Open Settings	Ctrl+P	Ctrl+E	Ctrl+P	Ctrl+P
Open Project	Ctrl+O	Ctrl+O	Ctrl+O	Ctrl+O
Save Project	Ctrl+S	Ctrl+S	Ctrl+S	Ctrl+S
New Project	Ctrl+N	Ctrl+N	Ctrl+N	Ctrl+N
Copy	Ctrl+C	Ctrl+C	Ctrl+C	Ctrl+C
Paste	Ctrl+V	Ctrl+V	Ctrl+V	Ctrl+V
Undo	Ctrl+Z	Ctrl+Z	Ctrl+Z	Ctrl+Z
Redo	Ctrl+Y	Ctrl+Y	Ctrl+Y	Ctrl+Y
Set Property	Mouse Scroll	None	None	None
10 Times Set Property	Ctrl+Mouse Scroll	None	None	None
100 Times Set Property	Shift+Mouse Scroll	None	None	None
1000 Times Set Property	Ctrl+Shift+Mouse Scroll	None	None	None
Rotate Viewport	Hold Right-click	None	None	None
Zoom Viewport	Mouse Scroll	None	None	None
Move Viewport	Hold Mid-click	None	None	None
Media Edit Effect	Ctrl+T	None	None	None
Adjust Projector Viewport Focal...	Mouse Scroll	None	None	None
10 Times Adjust Projector View...	Ctrl+Mouse Scroll	None	None	None
100 Times Adjust Projector Vi...	Shift+Mouse Scroll	None	None	None
1000 Times Adjust Projector Vi...	Ctrl+Shift+Mouse Scroll	None	None	None
Switch View	Ctrl+M	None	None	None
Move	A	None	None	None
Zoom	S	None	None	None
Rotate	D	None	None	None
Ring Array	Ctrl+R	None	None	None
Projector Fine Tuning	Ctrl+F	None	None	None
Ruler	Ctrl+B	None	None	None
Edit Lighting File	Shift+T	None	None	None
Adapt Lighting	Shift+M	None	None	None
Media Projection	Ctrl+G	None	None	None
Lock Selected Status	Shift+A	Shift+A	Space	Shift+A
Centered Display	Z	O	Z	Z
Perspective View	Ctrl+L	Ctrl+L	Ctrl+L	Ctrl+L
Front View	F	F	F	F
Rear View	V	V	V	V
Left View	L	L	L	L
Right View	R	R	R	R
Top View	T	T	T	T
Bottom View	B	B	B	B
Check UV Image	U	U	U	U
Hide Projector	P	P	P	P
Ground Grid	G	G	G	G
Maximize Stage	F10	F10	F10	F10
Zoom in Timeline	+	None	None	None
Zoom out Timeline	-	None	None	None

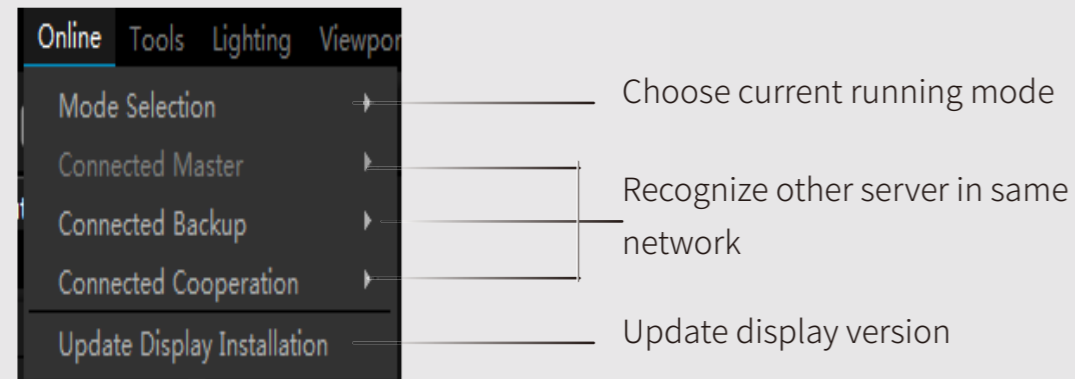
p. Menu---Online & Server output

The purpose of Online work

In the process of large projects, in order to prevent different degrees of force majeure, a main server and a backup server jointly execute the project will escort the whole event.

When facing an urgent project with huge scale and limited time, cooperated work will be best solution.

Menu---Online



hecoos Display: Run “hecoos Display” on display server in multiple server cascade project.

Master/Backup mode: The first server choose “Master”, the second server choose “Backup”. Run “hecoos Display” on display server.

Cooperation mode: The first server choose “Master”, the other server choose “Cooperation”. Choose “Connected cooperation” on Master server.

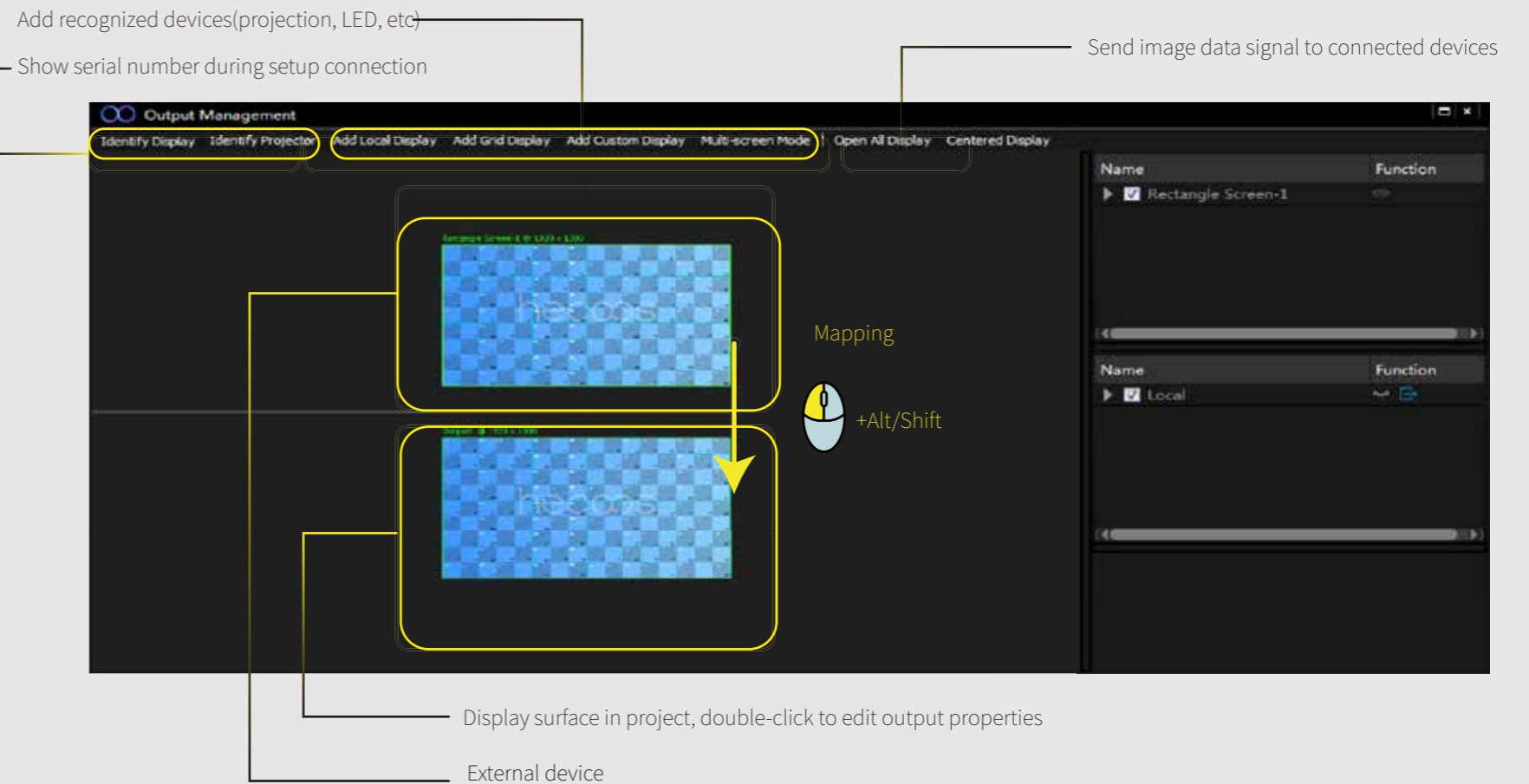
Hint:

When connection failed, please check whether all the sever under same network
Use multiple connected server for complicated work such as projection fusion

Output

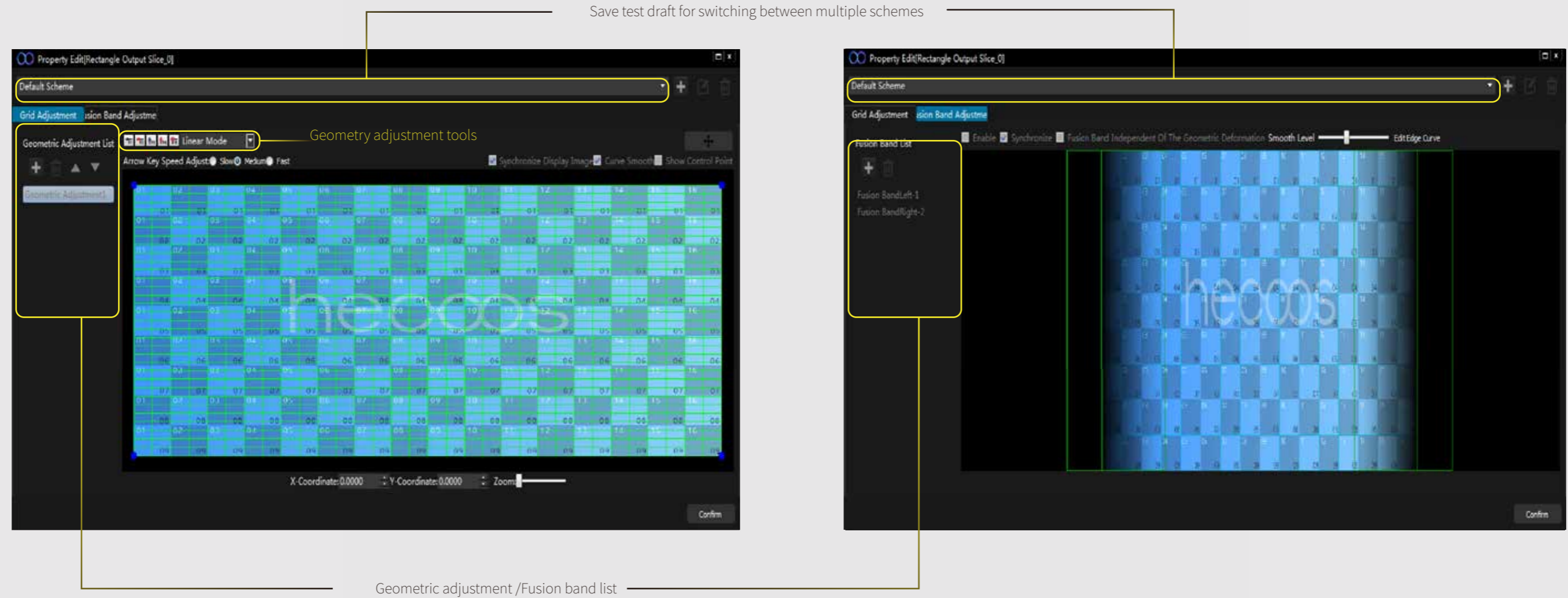
Open output management only on hecoos server.

Set multiple display to “extend these displays” on server



Output property editor

In test phase, the main function is geometry correction and projection fusion.



Quickly adjust the output image to the appropriate position with grid adjustment,Stitch multiple projections into a undivided whole by adding fusion bands

The adjustment of the grid correction and fusion band is realized by adjust the point, drag the selected point, and the output effect will be observed instantly.

q. Projection

The purpose of projection

In the situation that not suitable for slice mapping, hecoos provides parallel and perspective projection.

The parallel projection is designed for the scene that the image will stay still while the display surface is moving, the perspective projection is designed for depth scene, for example, CAVEs.

Principle of projection

The projection tools will project the media on display surface under the principle of projection tools.

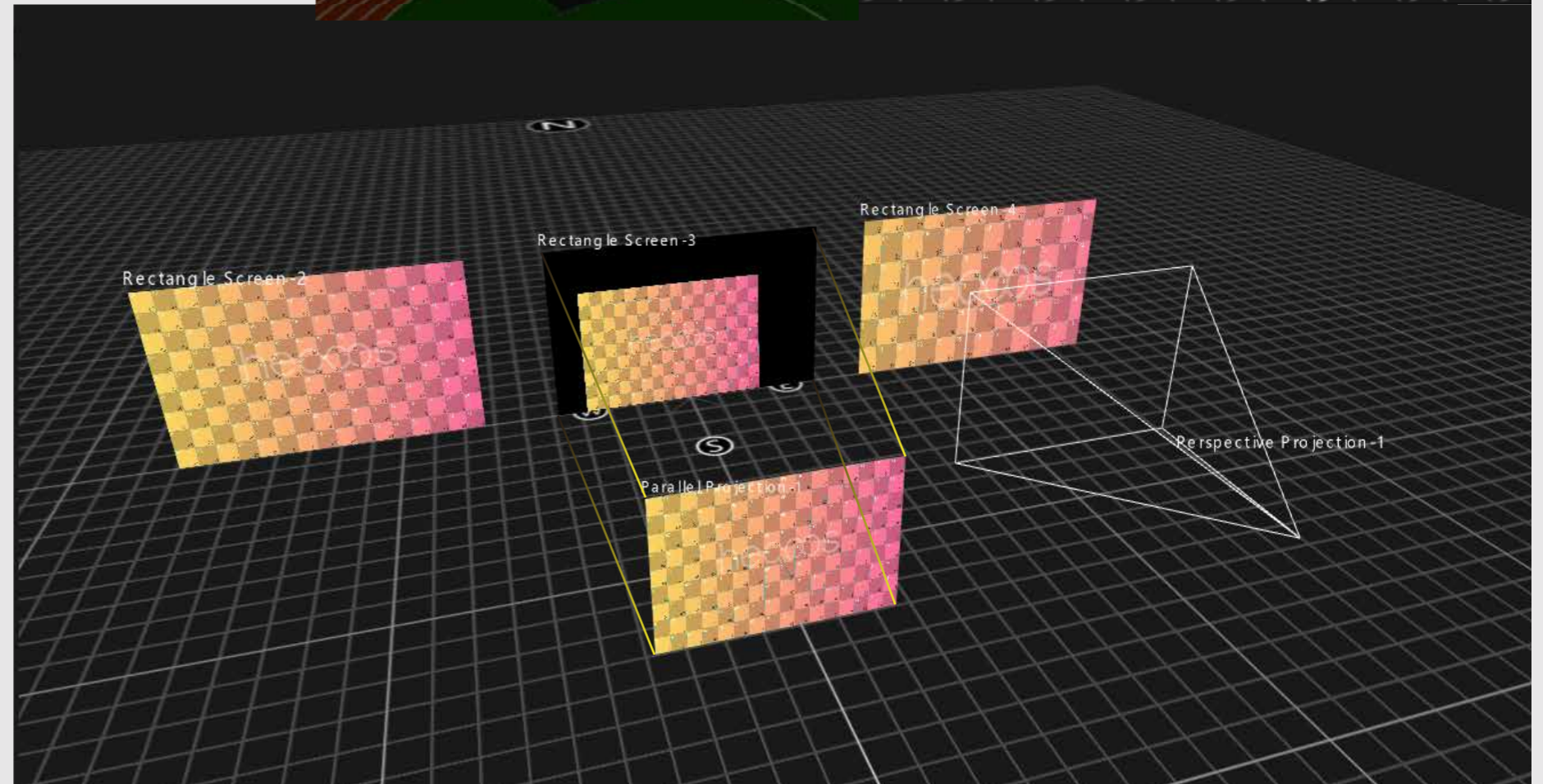
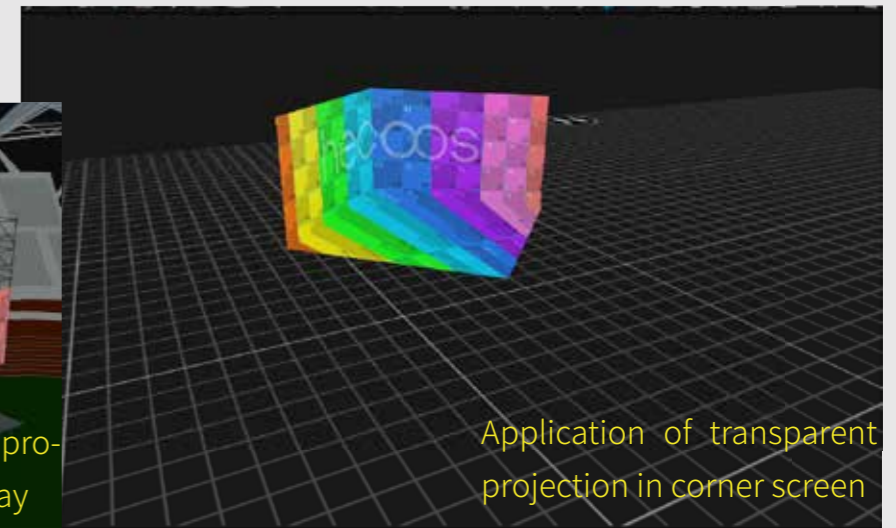
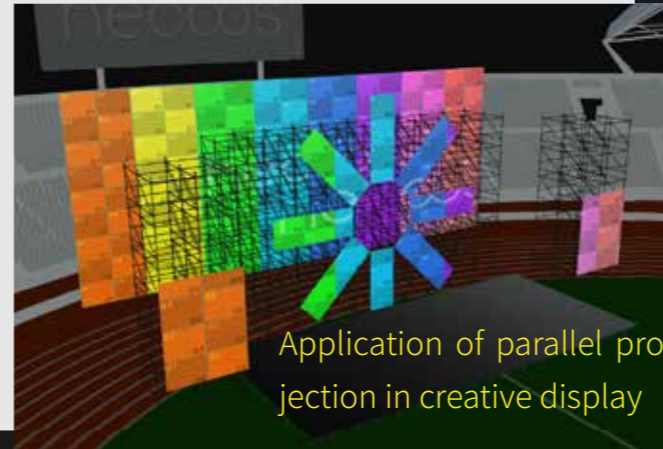
Parallel projection: Map original-sized media material to display surface that perpendicular to its screen direction.

Transparent projection: Map stretched media material to display surface that from its opening direction.

How to use

Project the media to the projection tools in timeline.

Choose the "Output surface" in projection tool's property to set the display surface.



r. Projection optical path design

Greatly simplified the process not only for early design but also implementation

Early design

Set up display surface, install projector (branded projector or universal projector) at selected position (pre-set installation position or test position).

Set the input surface of the projector as the display surface that needs to be mapped.

Open illuminance test, observe lux value and build a feasible installation scheme.

Add ambient occlusion model will help to simulate the actual scenario, adjust the light path to find the most suitable position for the projector.

By setting parameters of the universal projector, check the branded projector database, find the most suitable projector type.

Reference Values:

The recommend width for the each side of fusion band is 15%-20% of the relative edge length.

The optimally reflect illuminance in the dark scenario is around 200lux.

The shorter the projection path, the closer the projector should be to the vertical direction.

In the simulation data, the larger the pixel size, the stronger the particle scene in the real projection image.

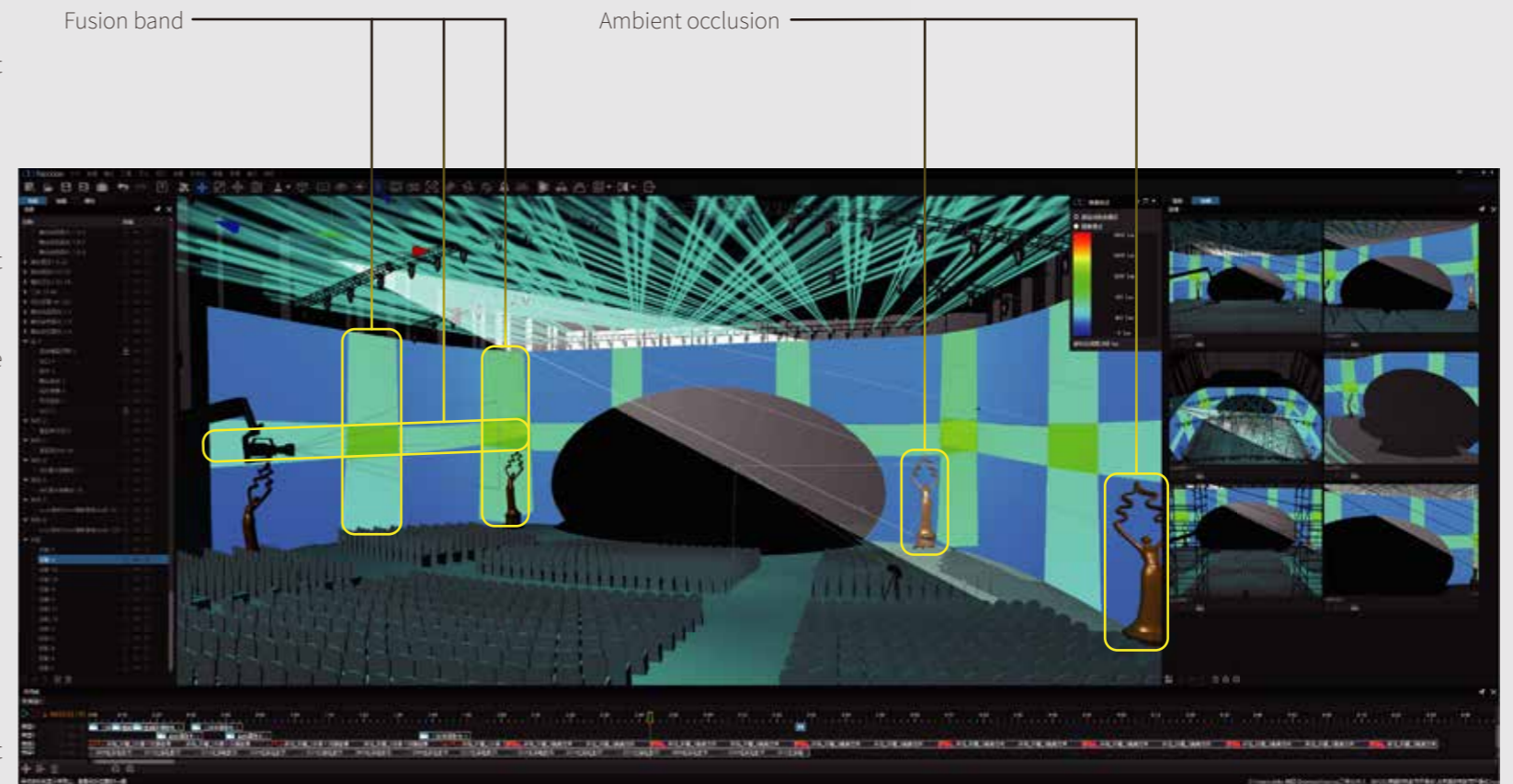
Lightpath design rules: Identify demands, feasible installation, leave fusion band, suited illuminance, the direct project is the best.

Implementation

Reduce the cost of communication by fixing the position according to the light path design scheme.

Use geometry fine-tuning and build fusion band to finish project when the actual fix position is same as the design scheme.

Implementation rules: Match the scheme as much as possible, leave fusion band for fine adjustment, especially take care of three or more images overlapping.



s. 3D Mapping

3D Mapping is a common technique for outdoor projection.

Using parallel/transparent projection/ UV mapping media on complicated surface to project image.

The designing process includes build 3D model for projected objects, calibrate projector position, mapping media material, use the virtual projector to catch the image on display surface and output the fusion image.

Tips: The 3D model should have the correct UV. Make media material based on required projection type.

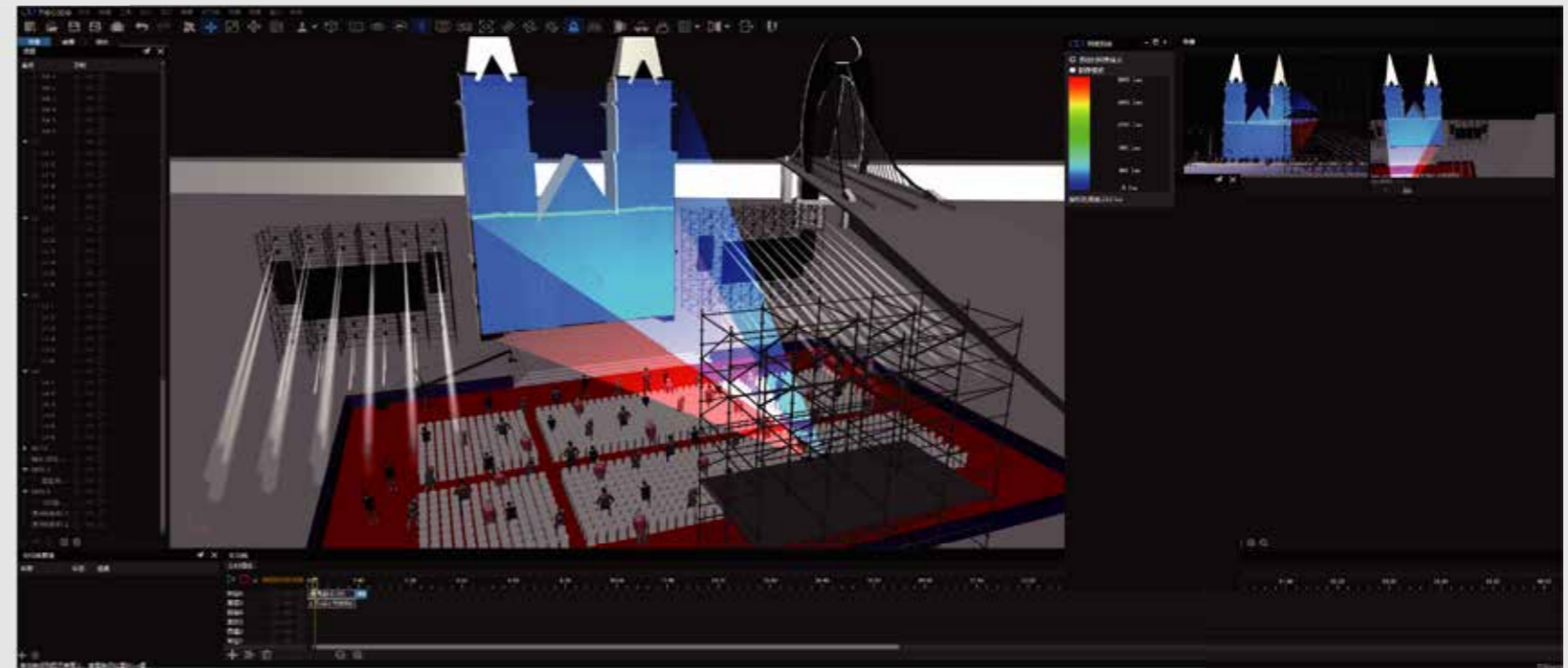
Procedure:

Import the 3D model. Map the media on the model surface.

Set projector, position projector with calibration.

When all the projectors have been set as the actual position, fine-tuning the grid and fusion band in output management.

Set timeline media and play it to output the image.



t. Keyframe animation

The keyframe is a method of recording device property parameters on the timeline.

By set keyframe on the selected device, it will move based on the preset track and posture when timeline is playing.

Procedure:

Choose the targeting device

Choose the starting point on timeline

Record keyframe in property tab

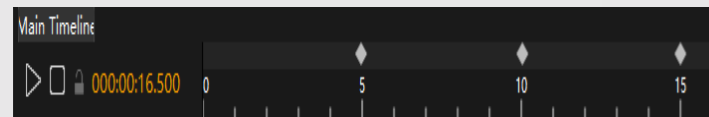
Set current keyframe value

Choose the next point on timeline

Repeat to record keyframe

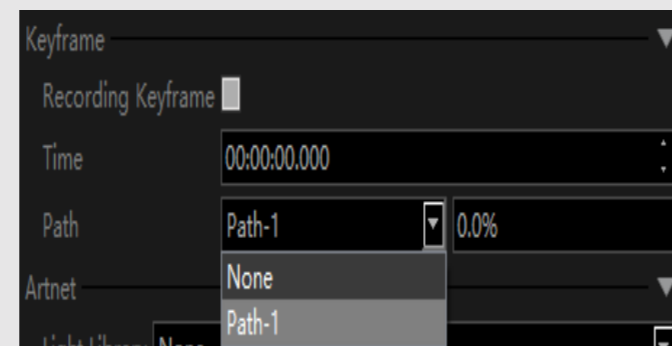
Set current keyframe value

Repeat the procedure to fullfill expected animation effect



Hint:


The keyframe nodes support dragging to new position, or can be selected by click or drag an area.



Choose path

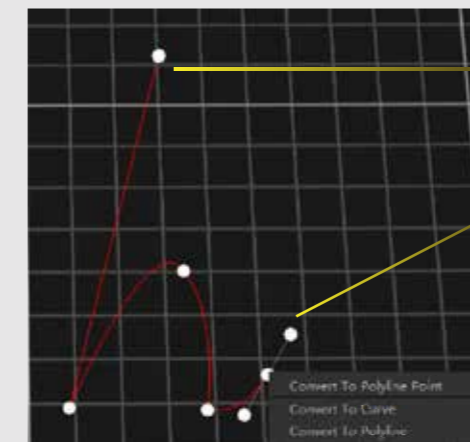
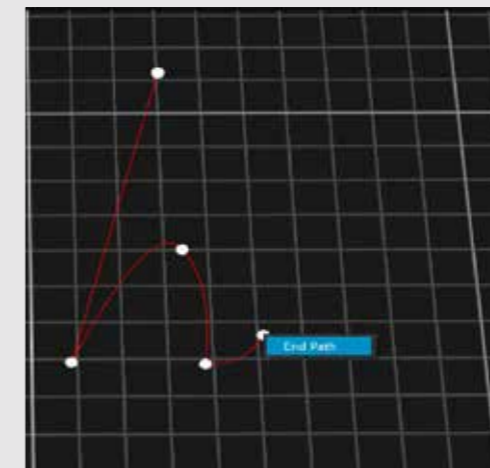
Choose position of the object on the path

Keyframe animation can be used with path functions

Click on the  Path tool to enter drawing mode

In drawing mode, click on the stage area to add anchor, click and drag to change curve angle, right click to end drawing or click on initial anchor to make a closed path to finish current editing.

The edited path can be used as the moving track for camera, projector or other devices.



Anchor, click to select and edit.

Support anchor, fix curve length and angle

Current status (not a button)

Convert the path to curve

Convert the path to polyline

u. Director system

The director system is a system for precise manipulation of cameras and media materials

While playing timeline media, hecoos execute control command and director command by following layer hierarchy

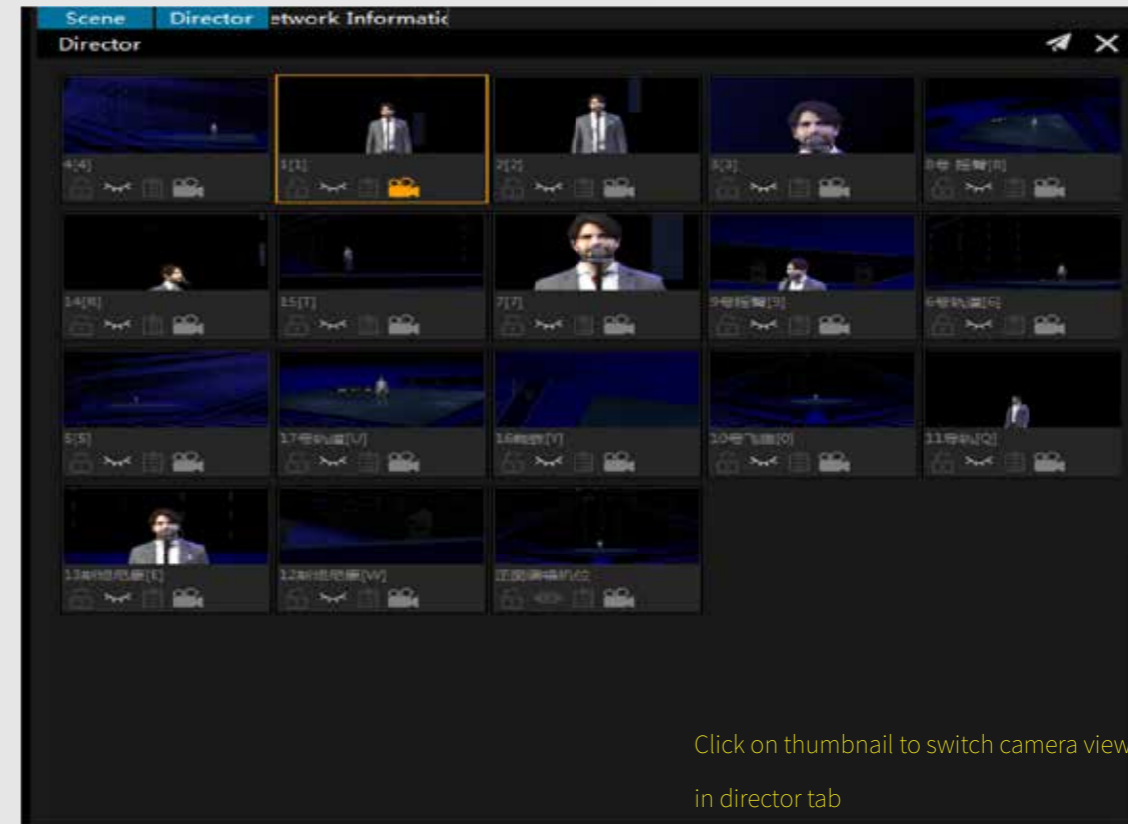
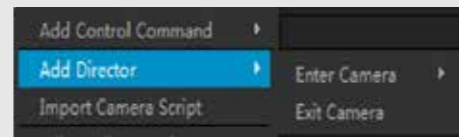
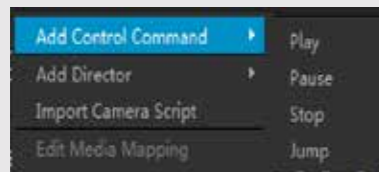
When multiple conflicting commands appear in the cursor position, hecoos will execute the commands on higher layer

Procedure:

Right click on timeline to create command

Control command and director command will apply whole timeline

For more complicated control command, use timeline management to create multiple timeline



Click on thumbnail to switch camera view
in director tab

The higher the layer place, the higher
the command execution priority



Cursor

Media material

Timeline

Enter projector

v. FAQ

Q1:What are the reasons that cause the frame dropping?

A:The hecoos is a real-time visualizer, which requires powerful GPU. If you are running on a laptop, please check if you are using individual GPU. Moreover, too much triangle number that carried by models will also cause lagging. Please optimize your model, reduce the unnecessary vertex and triangle. Another reason maybe adds too much lighting fixture under simulation mode, including projection simulation, real lighting mode, shadow mode. In this situation, balance the fixture number and display effect (File-Setting-Performance).

Q2:Why the model is missing in my project?

A:We do not copy the model file into hecoos software to add it as a custom tool, but just record the file path that saving in the computer. If the model file has been moved, renamed or deleted, hecoos cannot find the corresponding model. This is the reason that hecoos show the model is missing. So every time if you want to share the project file with your colleague or save the project for a long time, the best way is to pack the project (File-Project packing). We also recommend you to pack your project even you do not need to share or move it.

Q3:Why the material of the model missing when I import it into hecoos?

A:The general format of model (e.g. *.obj file) will carry a little of the material information. So if some of the material lost during the importing, you can use material system in hecoos to build a new one to apply. Or you can bake the material to the model in 3D software, which is supported to import into hecoos.

Q4:Why there is one face of the model becomes transparent after imported into hecoos?

A:The reversed normal face of a model is transparent in hecoos. This function makes it easily to observe the model from the outside. The 3D model building software will generate front face and reverse face for a certain model, that is, the normal and reverse normal. The property of the normal can be changed, however, there is only one front face for a certain model. In this case, you can set all the faces for your model with volume and the normal goes outside to solve this problem.

Q5:How to check and edit the UV information?

A:You can press “U” to check UV image after you select a model (When the model has a UV). If you want to edit the UV image, we recommend you to edit it in 3D model building software.

Q6:I cannot use output function, why?

A:The software you are using now is hecoos Studio, which not support output function. The hecoos Studio Pro and hecoos Server have output module. You can go to our official website (www.hecoos.com) to contact us for more information and asking for product support.

Q7:Can I find the project file several days ago?

A:Yes. Open auto-saving folder (File—Setting—Auto-saving), you can find the saved history files. The content and quantity of the file will differ due to auto-save interval and quantity settings.

Q8:What kinds of machinery or sensor can be adapted to hecoos ?

A:The hecoos supports most of the general protocols include but not limit to TCP/IP, UDP/IP, Artnet protocol, USB, DMX protocol,etc. So if the machinery or sensor supports these protocol, it can be adapted into hecoos.

Q9:Can I run hecoos on MAC device?

A:Yes.You can install Windows 10 on MAC device to running hecoos software. Caution, we do NOT recommend running hecoos on virtual OS.

Q10:When will hecoos publish macOS version?

A:We don't have a plan for hecoos macOS version.

Q11:I can not distinguish the spacial postion since all the display surface are black.

A:Please use “Projection Simulation” to light up all the display surface with test image.

Q12:Can I project a video during “Project Simulation” function?

A:Unavailable for now. Projection simulation is using projector as light source to interactive with models. For now, you can import image in resource management to replace default test image.

w. Postscript

Everytime when you need a tool to fullfill your borderless creation,

We

will give you a hand

.....

heccooos