
GAM200



KOS ENGINE
EDITOR
GUIDE



K-OS USER MANUAL

2024-2025

GREY GOOSE



USER MANUAL

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- NAVIGATING THE EDITOR
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- PERFORMANCE / INPUT PANEL
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- TILE EDITOR
- GRID EDITOR & PATHFINDING
- RAYCASTING
- PARTICLES (NEW)
- IN-ENGINE VIDEO (NEW)
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GREY GOOSE



USER MANUAL

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- TESTING FOR M5 RUBRICS (NEW)
 - Particle Component
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- MISC. TUTORIALS FROM PREVIOUS RUBRICS
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 - Changing of Scenes
 - Game Object Picking
 - Scale, Rotate, Translate
 - Drag and Drop Assets
 - Prefab Editor
 - Undo Feature
 - Automated Collision Data

GREY GOOSE

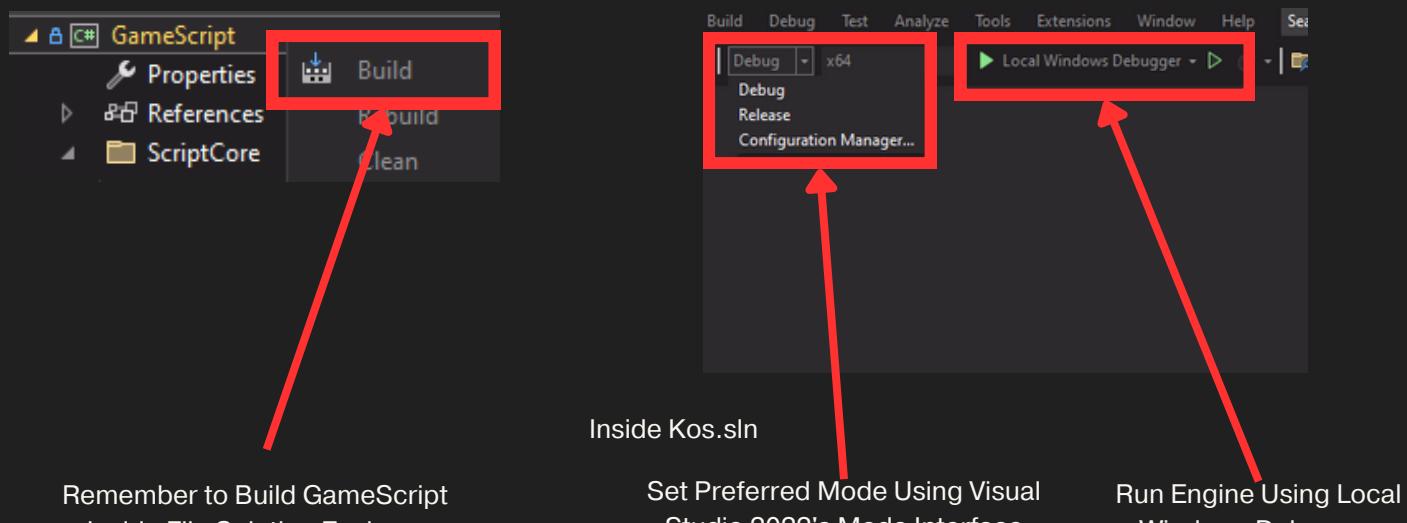


• LAUNCHING THE ENGINE

Kos Engine uses Visual Studio 2022 Platform Tool Set

📁 C#Mono	11/7/2024 11:32 AM	File folder
📁 Config	11/6/2024 12:48 PM	File folder
📁 De&Serialization	11/7/2024 2:18 PM	File folder
📁 Debugging	11/7/2024 5:03 PM	File folder
📁 Dependencies	10/16/2024 1:48 AM	File folder
📁 ECS	11/7/2024 2:18 PM	File folder
📁 Editor	11/7/2024 2:18 PM	File folder
📁 Events	11/7/2024 2:18 PM	File folder
📁 GameScript	11/1/2024 9:09 AM	File folder
📁 Graphics	11/7/2024 2:18 PM	File folder
📁 Inputs	11/7/2024 2:18 PM	File folder
📁 Math	11/7/2024 2:18 PM	File folder
📁 Physics	11/7/2024 2:18 PM	File folder
📁 ScriptLibrary	11/3/2024 9:05 PM	File folder
📁 x64	10/28/2024 12:43 AM	File folder
📁 Kos.sln	11/3/2024 9:05 PM	Visual Studio Solut... 3 KB
📁 RoombaRampage.vcxproj	11/7/2024 2:19 PM	VC++ Project 31 KB
📁 RoombaRampage.vcxproj.filters	11/6/2024 12:48 PM	VC++ Project Filte... 11 KB
📁 RoombaRampage.vcxproj.user	10/28/2024 2:35 PM	Per-User Project O... 1 KB

Open Kos.sln

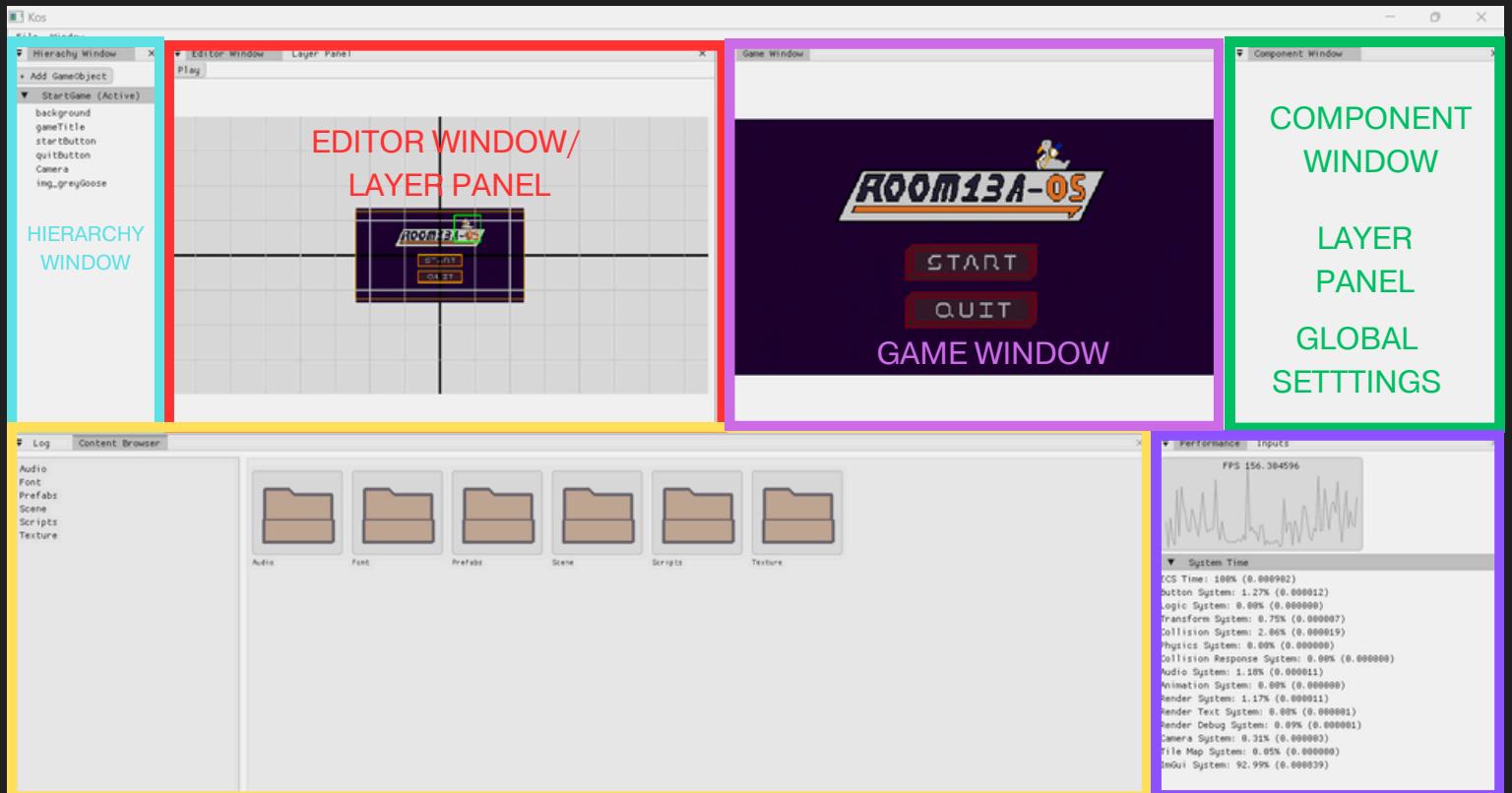


GREY GOOSE



• NAVIGATING THE EDITOR

ENGINE WINDOW



CONTENT BROWSER

PERFORMANCE / INPUT

CONSOLE LOG

```
logger initialized
[INFO]: 2024-11-29 17:41:41 - Application Start
[INFO]: 2024-11-29 17:41:41 - Load Log Successful
[INFO]: 2024-11-29 17:41:41 - Collision matrix loaded from PhysicsLayerMatrix.txt
[INFO]: 2024-11-29 17:41:41 - Load Config Successful
[INFO]: 2024-11-29 17:41:41 - Load Window Successful
[INFO]: 2024-11-29 17:41:41 - Load ECS Successful
[DEBUG]: 2024-11-29 17:41:41 - Successfully Added Script
[INFO]: 2024-11-29 17:41:42 - Loading entities from: Assets/Prefabs/prefab_door.prefab
[INFO]: 2024-11-29 17:41:42 - Load Json Successful
[INFO]: 2024-11-29 17:41:42 - Entities successfully loaded!
[INFO]: 2024-11-29 17:41:42 - Loading entities from: Assets/Prefabs/prefab_enemy.prefab
[INFO]: 2024-11-29 17:41:42 - Load Json Successful
[INFO]: 2024-11-29 17:41:42 - Entities successfully loaded!
[INFO]: 2024-11-29 17:41:42 - Loading entities from: Assets/Prefabs/prefab_enemyBloodPool.prefab
[INFO]: 2024-11-29 17:41:42 - Load Json Successful
[INFO]: 2024-11-29 17:41:42 - Entities successfully loaded!
[INFO]: 2024-11-29 17:41:42 - Loading entities from: Assets/Prefabs/prefab_player.prefab
[INFO]: 2024-11-29 17:41:42 - Load Json Successful
[INFO]: 2024-11-29 17:41:42 - Entities successfully loaded!
[INFO]: 2024-11-29 17:41:42 - Loading entities from: Assets/Prefabs/prefab_playerBullet.prefab
[INFO]: 2024-11-29 17:41:42 - Load Json Successful
[INFO]: 2024-11-29 17:41:42 - Entities successfully loaded!
[INFO]: 2024-11-29 17:41:42 - Loading entities from: Assets/Prefabs/prefab_wallDoor.prefab
[INFO]: 2024-11-29 17:41:42 - Load Json Successful
[INFO]: 2024-11-29 17:41:42 - Entities successfully loaded!
[INFO]: 2024-11-29 17:41:42 - Filepath: Assets/Texture/AssetBrowserIcon/img_audioWav.png
[INFO]: 2024-11-29 17:41:42 - Texture_Binded - Texture_ID : 2
```

CONSOLE LOG

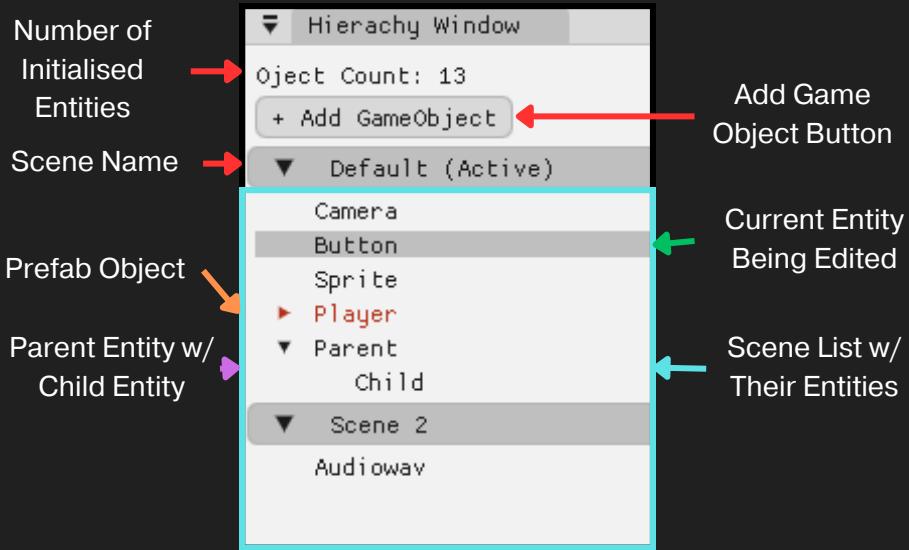
```
[INFO]: 2024-11-29 12:41:53 - Application Init Successful
[INFO]: 2024-11-29 12:41:53 - IMGUIENABLED is defined
[INFO]: 2024-11-29 12:41:53 - Load ImGui Successful
[INFO]: 2024-11-29 12:41:53 - Set Input Call Back Successful
[INFO]: 2024-11-29 12:41:53 - Load Graphic Pipeline Successful
[INFO]: 2024-11-29 12:41:53 - Shader compiled successfully
[INFO]: 2024-11-29 12:41:53 - Load Asset Successful
[INFO]: 2024-11-29 12:41:53 - Entities successfully loaded!
[INFO]: 2024-11-29 12:41:53 - Load Json Successful
```

GREY GOOSE

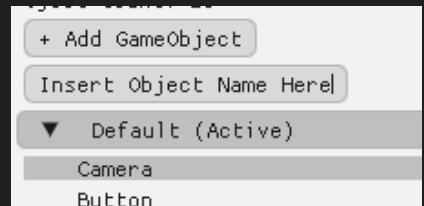


HOW TO USE

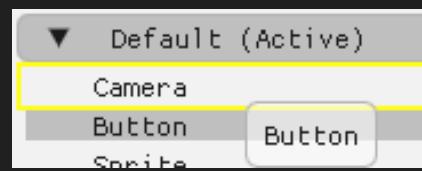
- HIERARCHY WINDOW



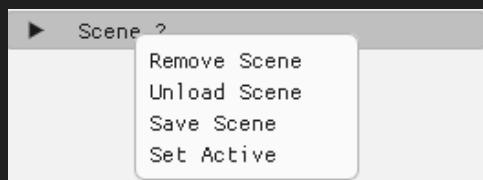
After Clicking on “Add GameObject”
Type in Object Name and Press Enter
to Create New Entity



Drag entities into other entities to transform into a child of the entity



Drag Prefabs/Scenes from the Content Browser into the Hierarchy Window to Load Prefab/Scene

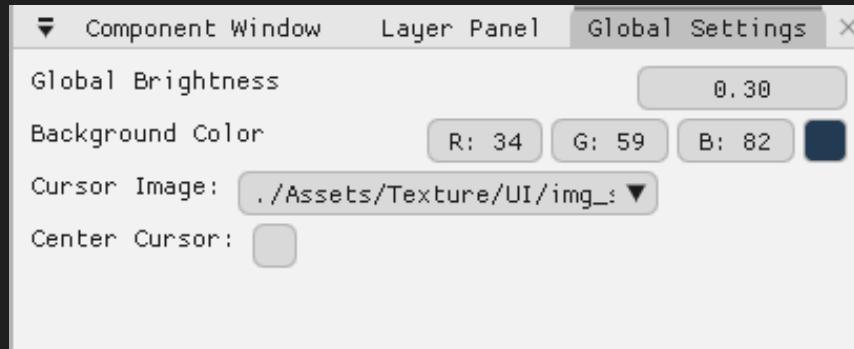


GREY GOOSE



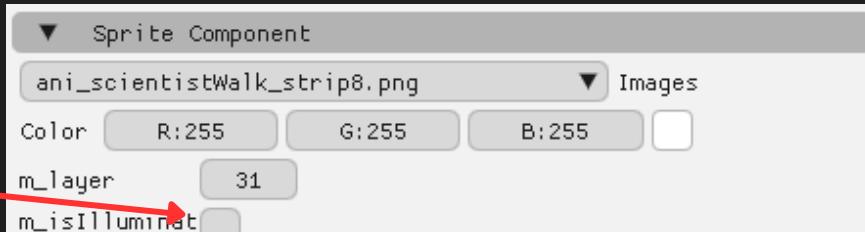
HOW TO USE

• GLOBAL SETTINGS WINDOW



- Global Brightness controls how sprites and tile maps will be rendered.
- Lower values indicate that it will be darker.
- Change the cursor image by selecting the textures. Toggle cursor centering if needed.

Set To False To
Prevent Lighting
Calculations



- To prevent certain sprites from being illuminated, you can control the sprite to be drawn without being affected by lighting by changing its m_Illuminated value to false.

GREY GOOSE



HOW TO USE

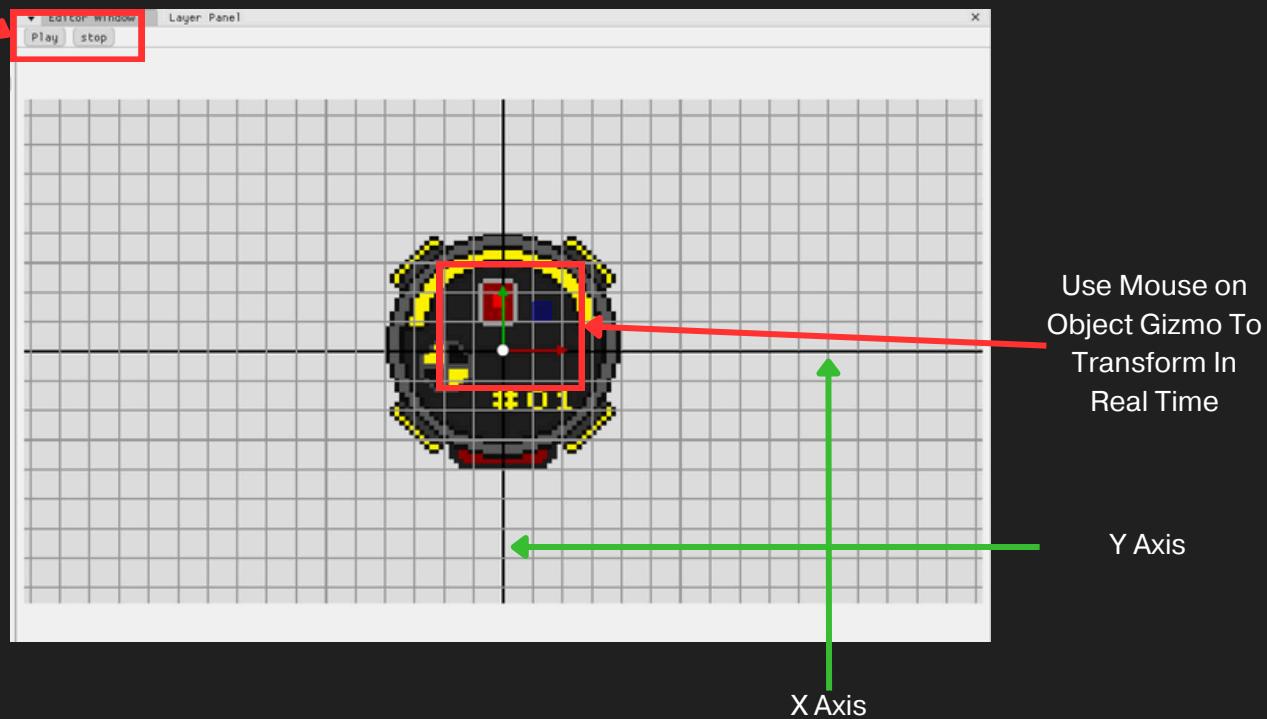
• EDITOR WINDOW

Play/Pause &
Stop Button

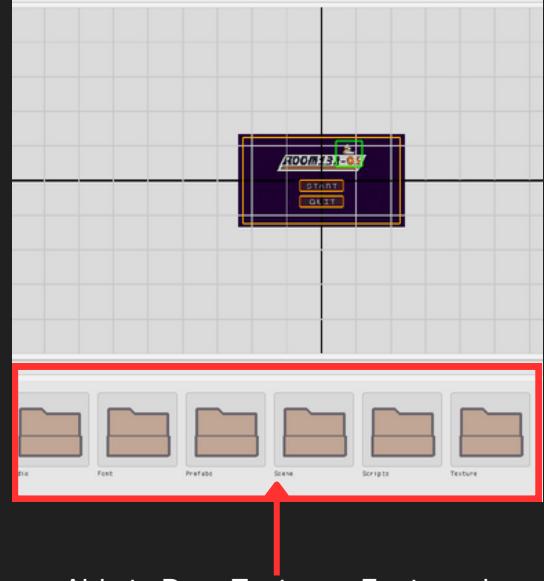
Play Button
Begins Time
Calculations and
Time Reliant
Systems

Pause Button
Pauses Time
Calculations

Stop Button
Reset Objects
To Original Time



- Hold Right Click in the Editor Window to Drag Editor Camera Around
- Zoom In and Out Using Mouse Scroll Wheel
- Press “Ctrl + R” to Reset Camera Back to Center
- Press “R” to enable scale gizmo.
- Press “T” to enable translation gizmo.
- Press “E” to enable rotation gizmo.



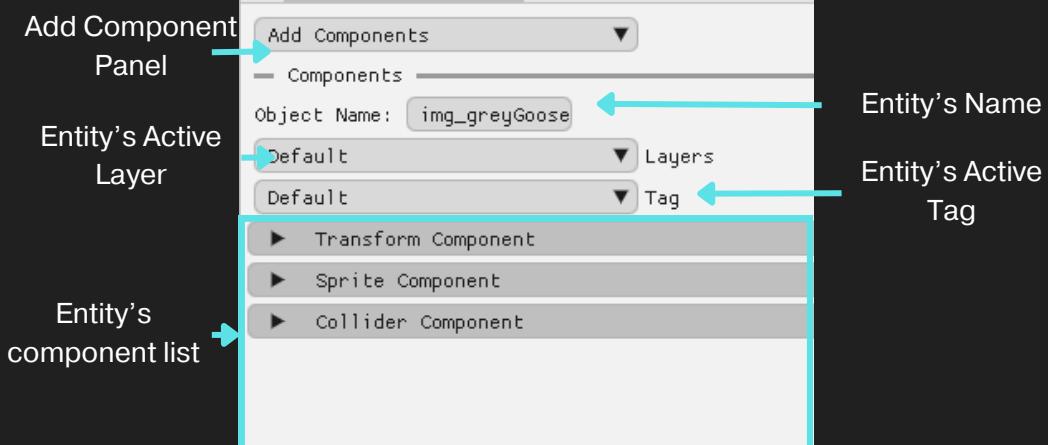
Able to Drag Textures, Fonts and
Prefabs from the Content Browser into
The Editor Window

GREY GOOSE

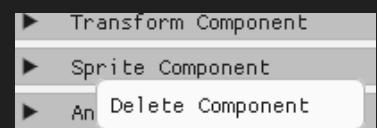


• COMPONENT WINDOW

HOW TO USE



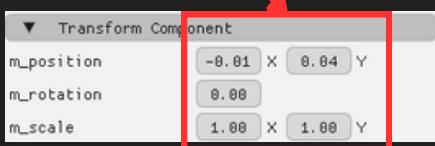
Right Click Component To Show Delete Option



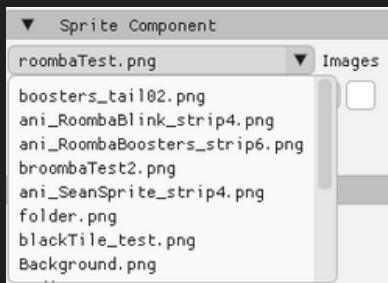
Note: You can not Delete Transform Component

WIDGETS

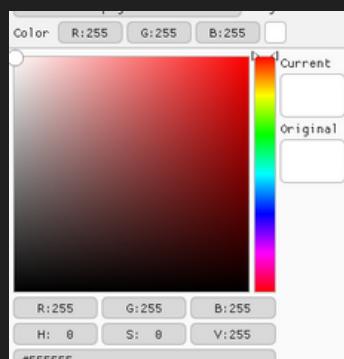
Generic Drag Buttons:
Drag Along The Buttons
To Modify Data Member



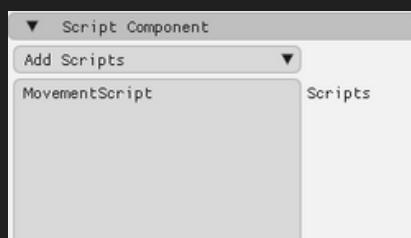
Drop Down Menu:
Pick Data Within the List



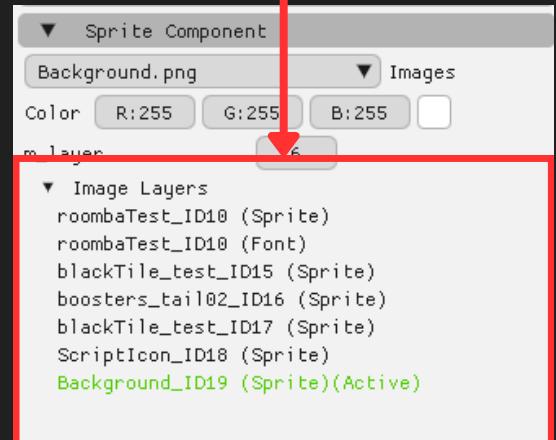
Color Picker:
Pick Custom Color



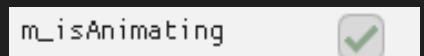
Script Window:
Active Scripts are Displayed



Image/Font Layer Interface:
Drag The Layer Objects to
Adjust Image Layers



Checkbox:
Tick If True, Else False



GREY GOOSE

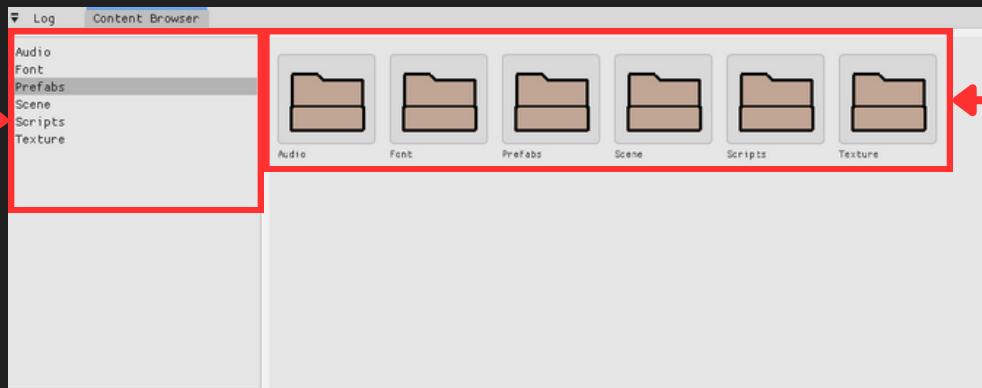


• CONTENT BROWSER

HOW TO USE

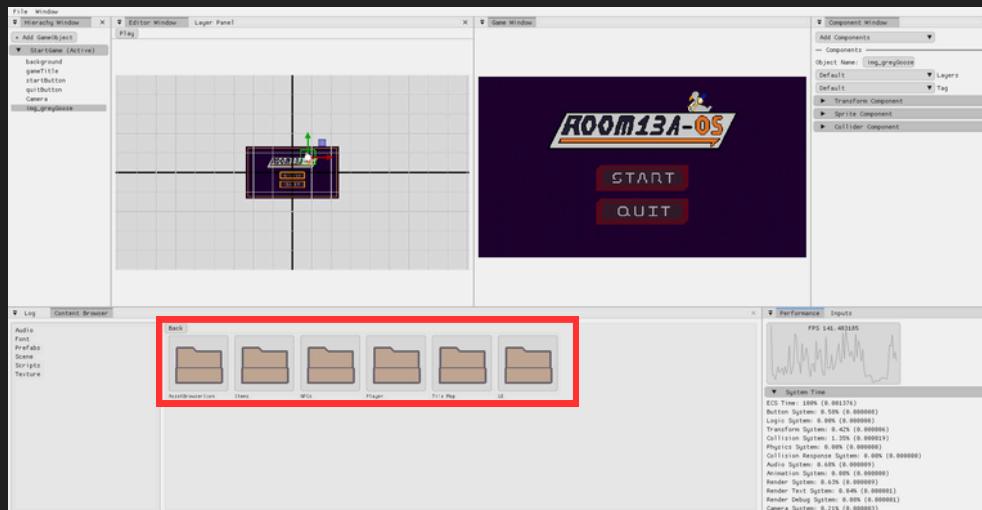
CONTENT BROWSER

Click Headers to Access Contents of Folder



Double Click Folders to Access Contents of Folder

TEXTURE



Example: AssetBrowserIcon



Example: AssetBrowserIcon

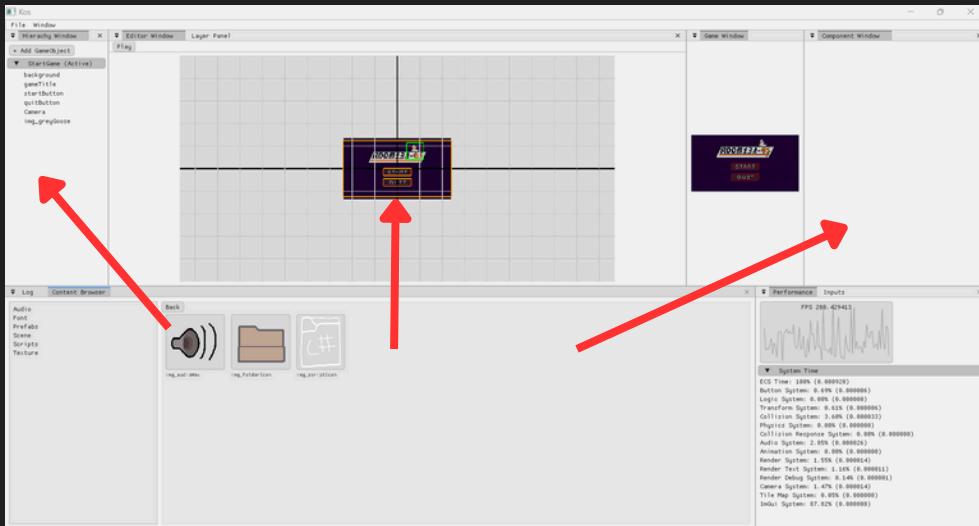


GREY GOOSE

• CONTENT BROWSER

HOW TO USE

Drag
Scenes/Prefabs
To Hierarchy To
Create Scene/
Prefab



Drag
Textures/Font
/Audio
To Component
Window To
Create
Component or
Change Asset

Drag
Textures/Font
/Prefabs To
Editor Window
To Place Them
In The Scene



Right Click Asset
To
Rename/Delete

Assets are automatically loaded when engine is launched

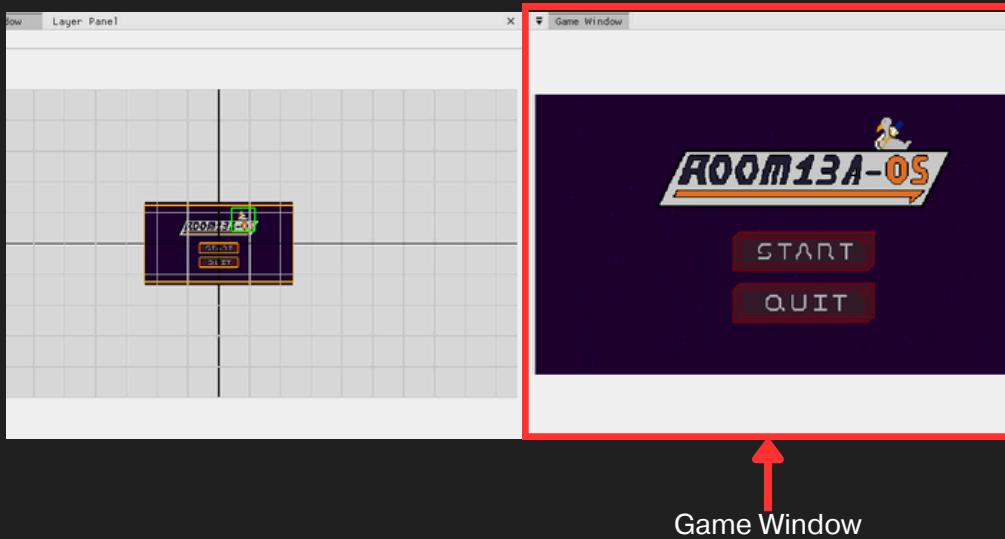
GREY GOOSE



• GAME WINDOW

HOW TO USE

GAME WINDOW



- Game Window shows the preview of the Game Scene from the perspective of the Active Camera
- Game Window does not display any debug drawings
- Active Camera will be defaulted to the Editor Camera if there are no camera components present.

GREY GOOSE



• LOG

HOW TO USE

CONSOLE WINDOW

```
[INFO]: 2024-10-03 21:30:35 - Testing of Logging Information 50
[DEBUG]: 2024-10-03 21:30:35 - Testing of Logging Debug
[ERROR]: 2024-10-03 21:30:35 - Testing of Logging Error with Source Location
FUNC: void __cdecl logging::Logger::m_TestingLog(void) LINE: 147 FILE: C:\GreyGoose\RoombaRampage\Debugging\Logging.cpp
[ERROR]: 2024-10-03 21:30:35 - Testing of Logging without source location
```

- Console Window outputs flavor text depending on the event that has occurred.

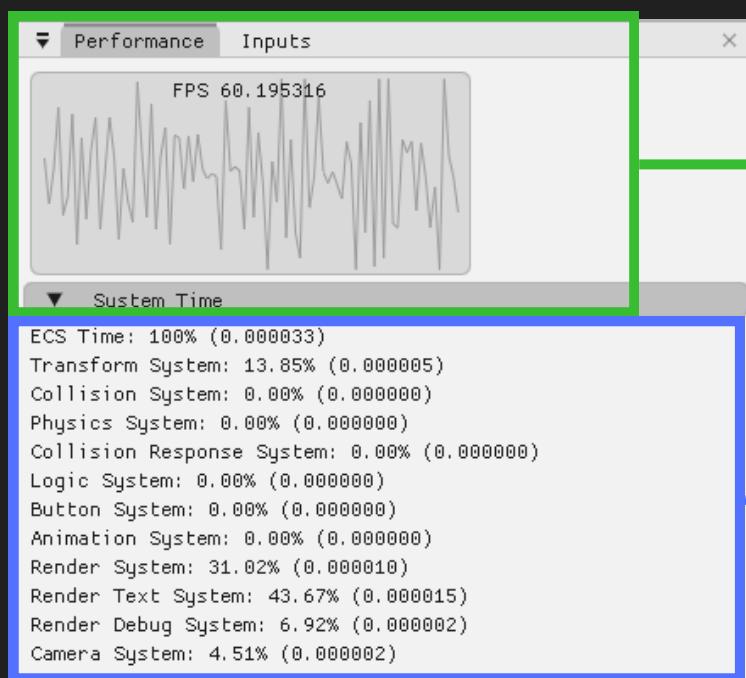
LOG PANEL



- Log Panel outputs various information regarding editor actions.

• PERFORMANCE / INPUT PANEL

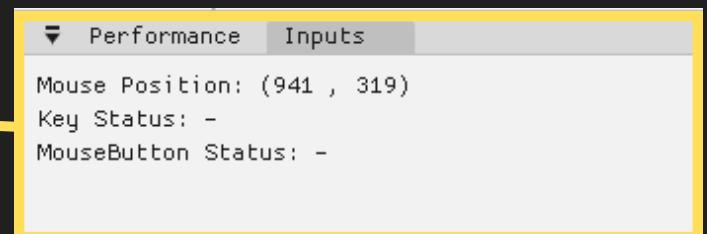
HOW TO USE



Graph plotter shows **FPS Performance** of Engine at Runtime

Breakdown of **System Performance** in relation to Engine Time

Shows **Current User Inputs** in Engine at runtime



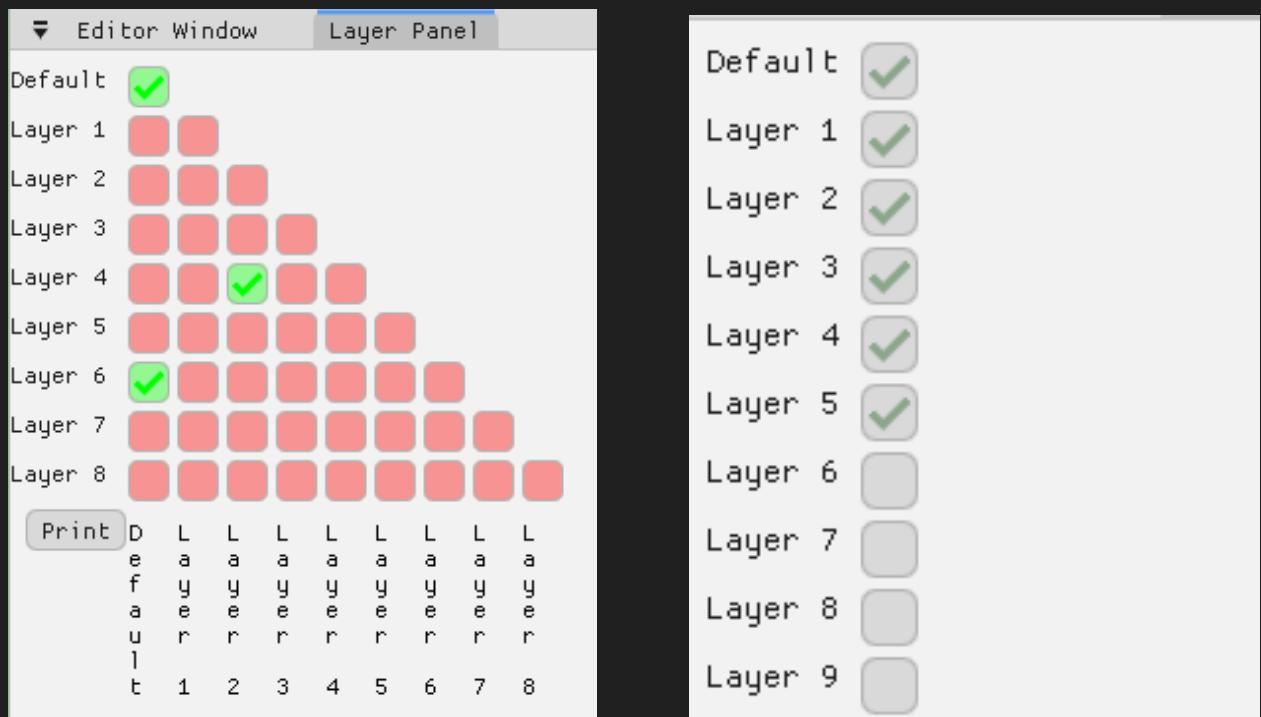
GREY GOOSE



• LAYER PANEL

HOW TO USE

LAYER PANEL



- This layering system is meant for objects of different layers to toggle its collision logic with each other.
- Click onto the boxes to activate the layers.
- In this example, the default layer and layer 6 will interact with each other. Layer 4 and Layer 2 will interact with each other.
- Press print to display the layer matrix.
- The Layer Panel also displays a layer visibility panel.
- Check the box to display objects of that layer.
- Uncheck the box to hide any objects that are of the unchecked layer.

GREY GOOSE



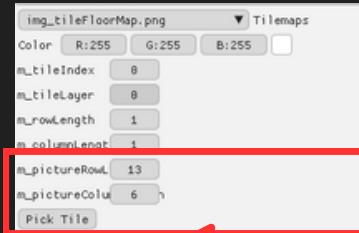
• TILE EDITOR

HOW TO USE

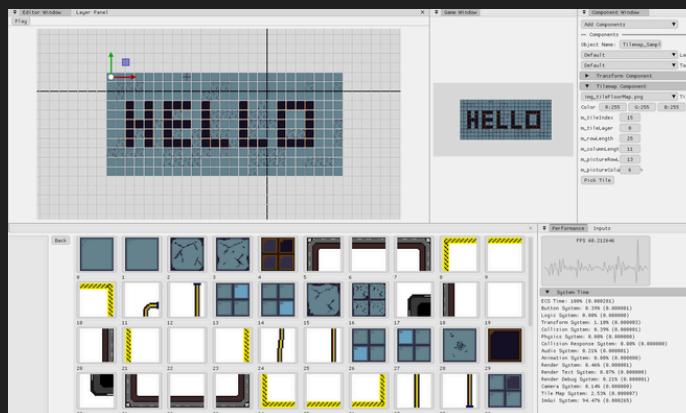
TILE EDITOR



Example: img_tileFloorMap



- Here is a sample tile map image to be used with tile map component
- In this example, this tile map has a row length of 13 and a column length of 6.
- Manually set the number row length and column length to slice the tile map accordingly
- Select “Pick Tile” to enter the Tile map editor.



- Inside tile editor mode, a selection of tiles will appear based on the number of tiles that have been sliced
- Double click the desired tile you wish to use to change to it.
- Click any block in the grid to insert a tile with the current selected tile.
- The tile set will automatically expand if a tile is selected outside of the current tile set.
- The default tile drawn will be the tile labeled with index 0.
- Press “Back” inside the content browser to exit tile editor mode.
- Notes : Objects with tilemap component are automatically scaled to fit one block, and can only be snapped towards whole numbers within world coordinates.

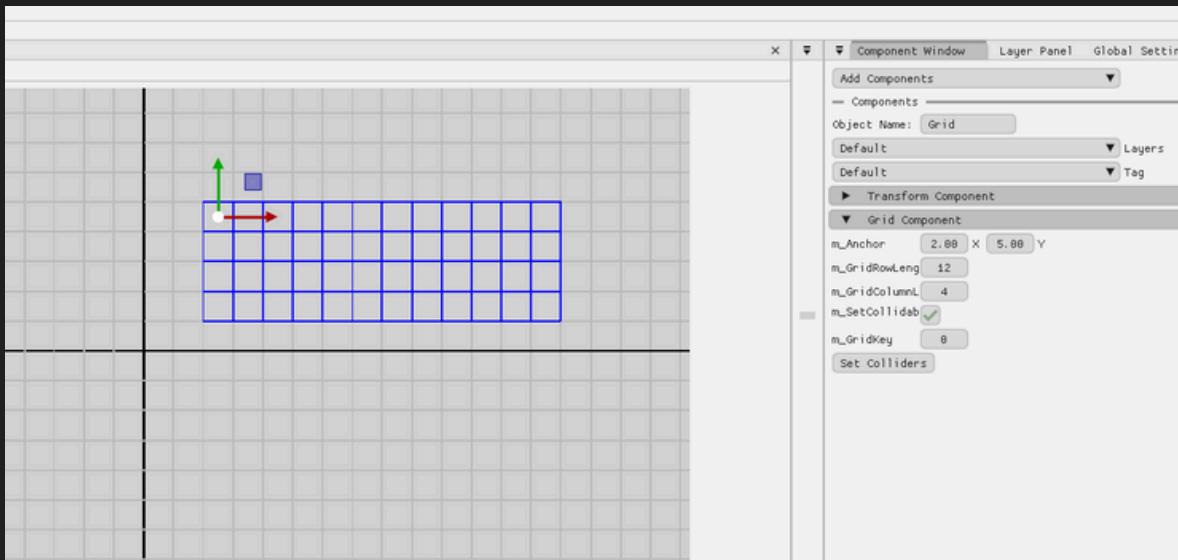
GREY GOOSE



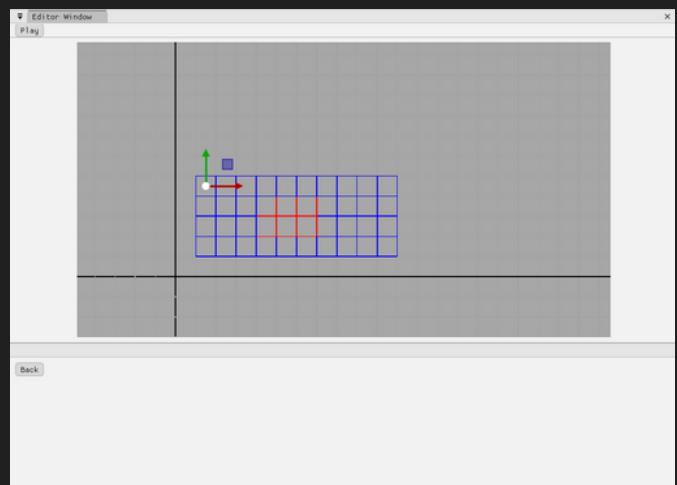
• GRID EDITOR

HOW TO USE

GRID EDITOR



- The grid component works as the basis for pathfinding components.
- On the left shows a basic grid with a row length of 12 and column length of 4.
- Manually set the number row length and column length to change the grid
- Select “Set Colliders” to enter the Grid editor.
- Similar to the tilemap editor, once in Grid Editor Mode, you can click onto the grids to individual set which tiles are non-passable for the pathfinding system.
- To set whether it will be passable or non-passable, toggle the `m_SetCollidable` member of the grid component.
- Blue tiles indicate a passable grid, while red tiles indicate an non-passable grid.



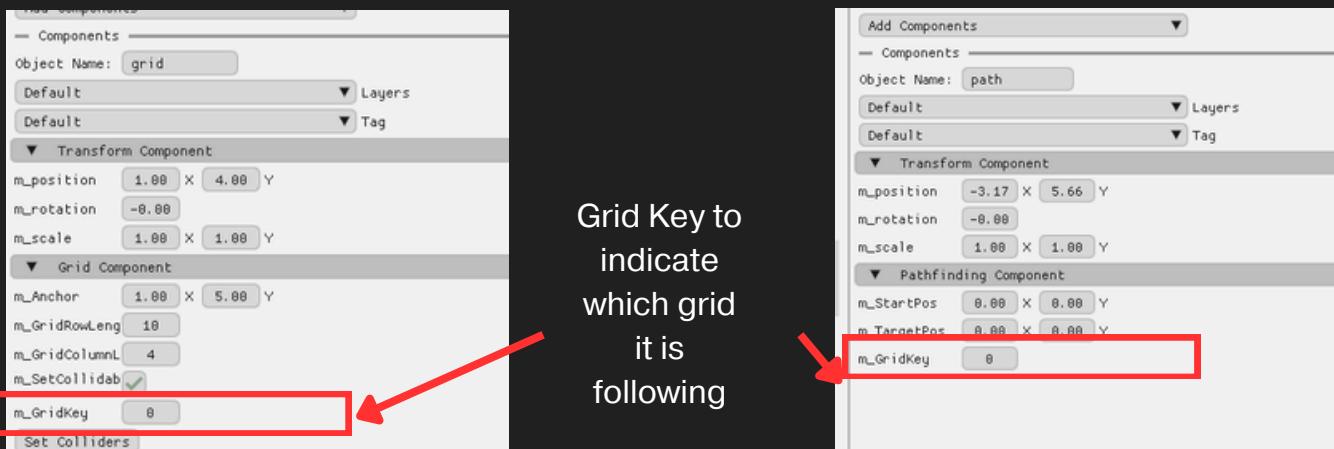
GREY GOOSE



• GRID EDITOR

HOW TO USE

PATHFINDING COMPONENT



Grid Key to
indicate
which grid
it is
following

- Ensure that the pathfinding component is within the boundaries of the grid
- Ensure that the pathfinding component has its grid key set to the grid key it wishes to follow.

GREY GOOSE



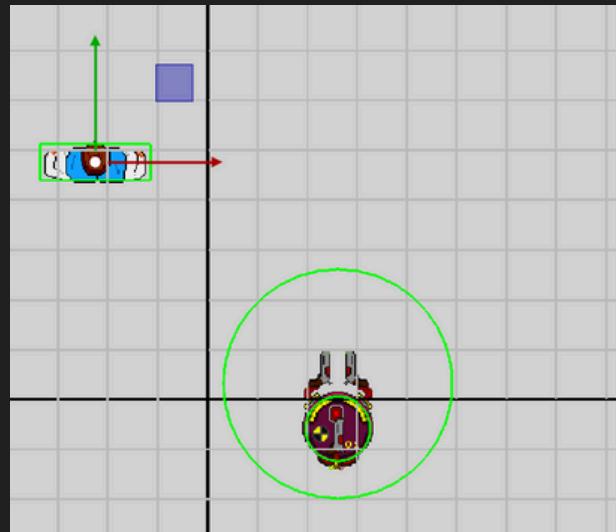
• RAYCASTING

HOW TO USE

RAYCASTING COMPONENT



- The Raycasting component shoots a line from the object to the target position. If the line does not intersect and rectangle.
- m_rayID: UniqueID for each Ray that
- m_IsRaycasting: Runs Raycast System if true.
- m_targetPosition: target where objects will shoot a line towards
- m_Layers: Object that the Raycast line will test with to see if it is intersecting.
- m_targetreach: If Raycast line reaches target without intersecting any object, it will return true. False otherwise
- m_hitposition: the point of intersection when intersect.



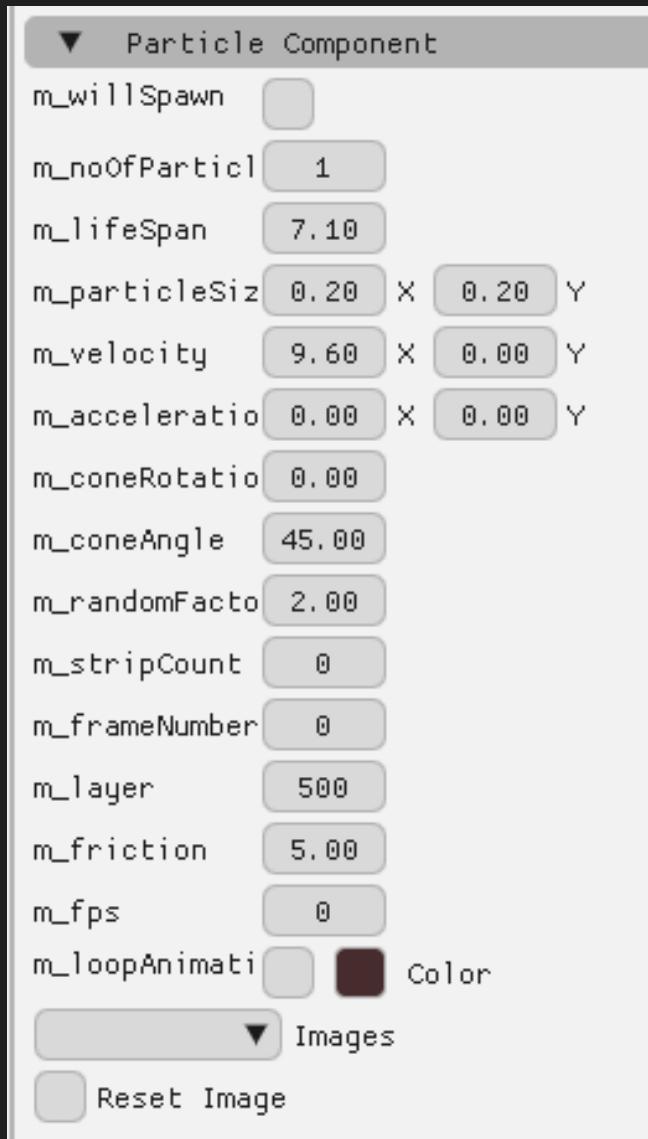
GREY GOOSE



• PARTICLES

HOW TO USE

PARTICLE COMPONENT



- m_willSpawn will indicate to the particle system whether it will spawn during the next frame. It will automatically turn off the next frame.
- m_noOfParticles will indicate how many particles will spawn during one frame.
- m_lifeSpan will indicate how long the particles will last.
- m_particleSize will change the size of the particles.
- m_velocity/m_acceleration will change the velocity/acceleration of the particles.
- m_coneRotation indicates the angle at which the cone emits the particles.
- m_coneAngle indicates how wide the emission angle is from the emitter.
- m_stripCount indicates the number of sprites inside the image's sprite sheet.
- m_frameNumber is the index of the sprite inside the sprite sheet.
- m_layer indicates the depth of the texture.
- m_friction indicates how much friction the particle will experience.
- m_fps is how many frames per second the animation will play.
- Images allow you to pick your texture for the particle.
- Reset Image sets an empty image, defaulting to squares for particles.

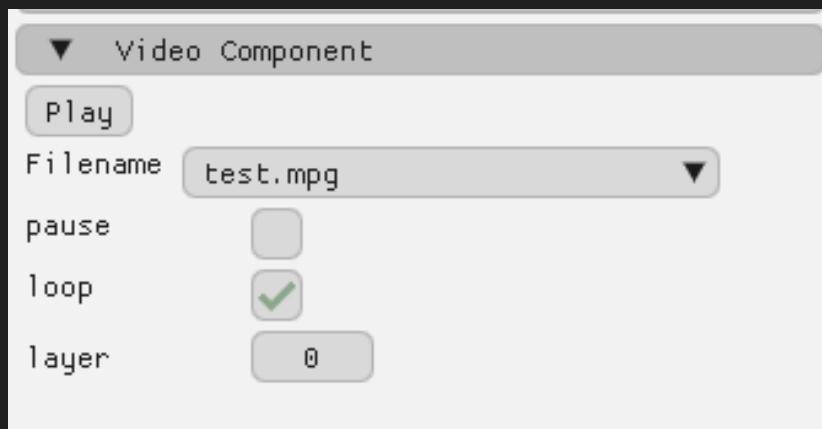
GREY GOOSE



- **VIDEO**

HOW TO USE

VIDEO COMPONENT



- Add a video component into the entity
- Ensure the video is in the asset folder or drag the video into the asset browser.
- Only .mpg and .mpeg videos are supported
- Press play to play the video, select pause to pause the video, loop for the video to play again after it finishes.
- Adjust layer to adjust depth between videos

- **SPECIAL INSTRUCTIONS**

HOW TO USE

- Press F11 to enter fullscreen for the game window.
- Press “CTRL + Q” to enable gizmo snapping.
- Press “F” to center to selected object.
- Press “SHIFT + F” to follow selected object.
- Press “Alt + TAB” to toggle to window mode

GREY GOOSE

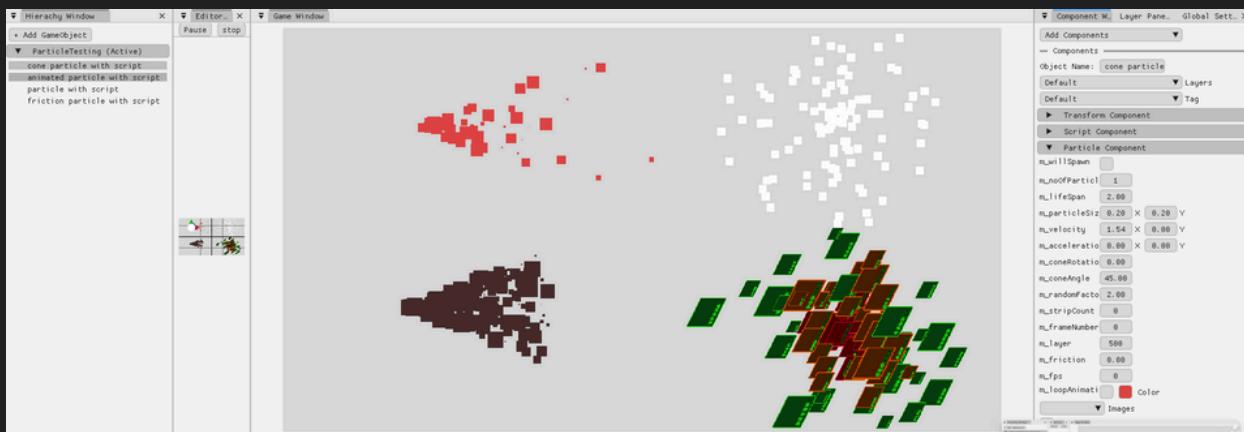


• TESTING

HOW TO USE

PARTICLE COMPONENT

- Navigate to the ParticleTesting.json scene through the content browser, inside the scenes folder. Double click the scene to access the light testing scene.



- You will see 4 entities set up with a particle component in each of them.
- Press play to start emitting particles from each of them
- You can tweak the particle parameters to see the changes in real time.

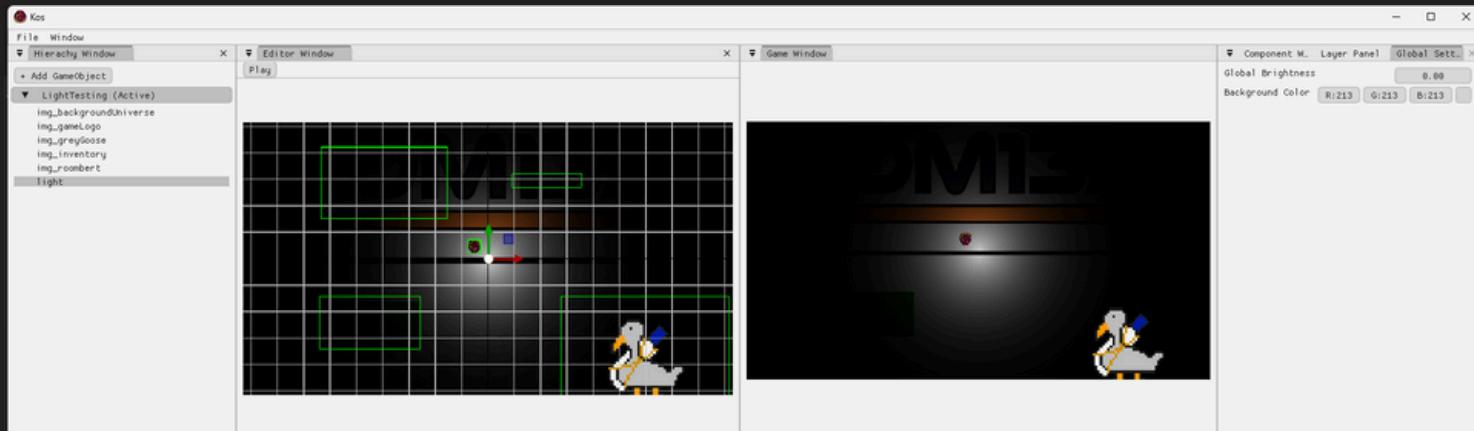
GREY GOOSE



• TESTING

HOW TO USE

LIGHTING COMPONENT



- You will be greeted by a scene with the global illumination value set to zero, meaning objects cannot be seen without any lighting.
- Certain objects can be set to be unaffected by lighting by navigating to the sprite component panel and setting `m_isIlluminated` to false for that particular sprite.
- Select the entity with the name “light” and adjust the light parameters to your liking. (e.g. Drag the light around)
- The current lighting model is multiplicative lighting.

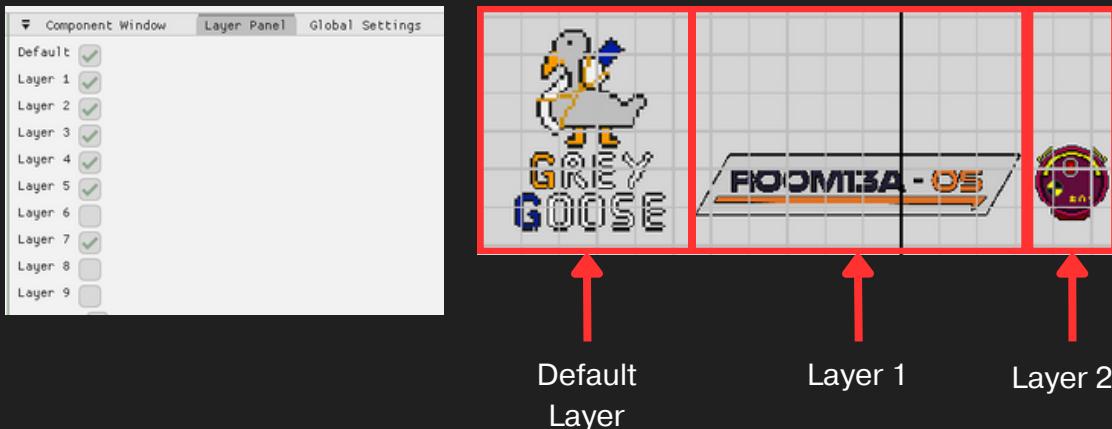
GREY GOOSE



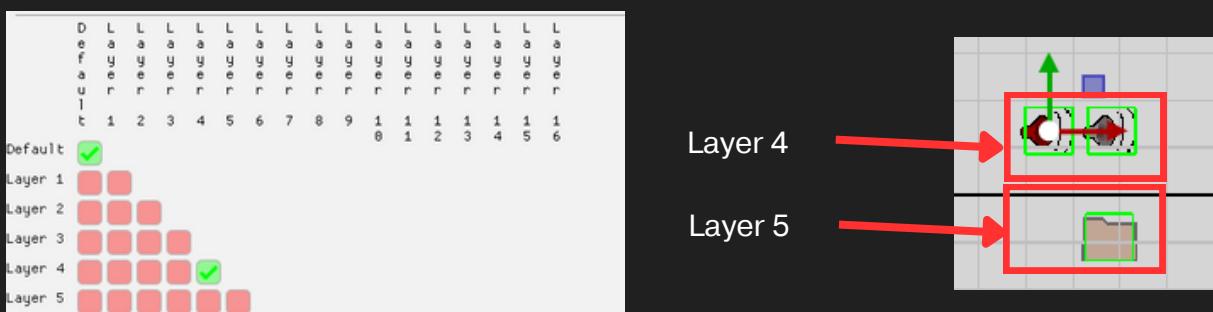
- **TESTING**

HOW TO USE

LAYER TESTING



- Toggle the visibility layers by clicking on the layer check boxes inside the layer panel.



- Calibrate the collision layers on the left for collision responses to occur between selected layers. Layer 4 will affect layer 4 based on the left picture.
- Press Play inside the editor window to begin physics. Drag the rigid body into the different colliders to test the effect, try toggling layer 4 to be interactable with layer 5 to be able to collide with layer 5.

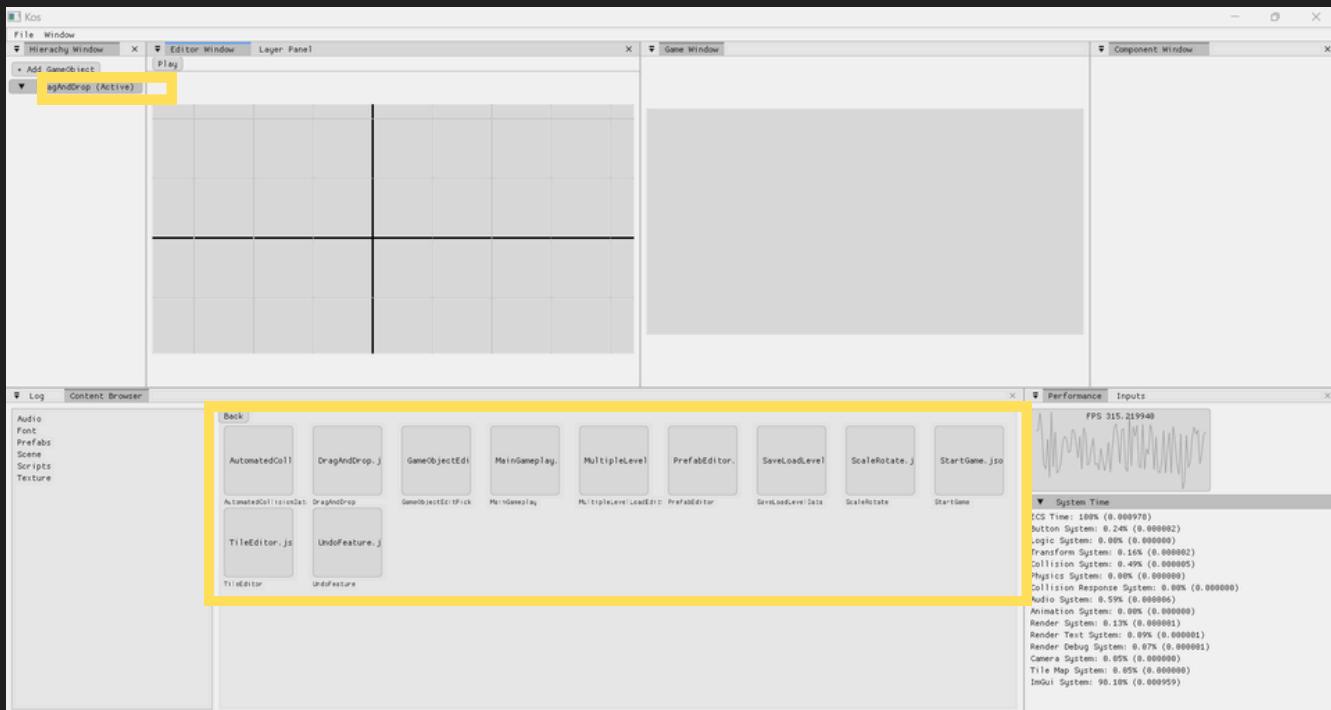
GREY GOOSE



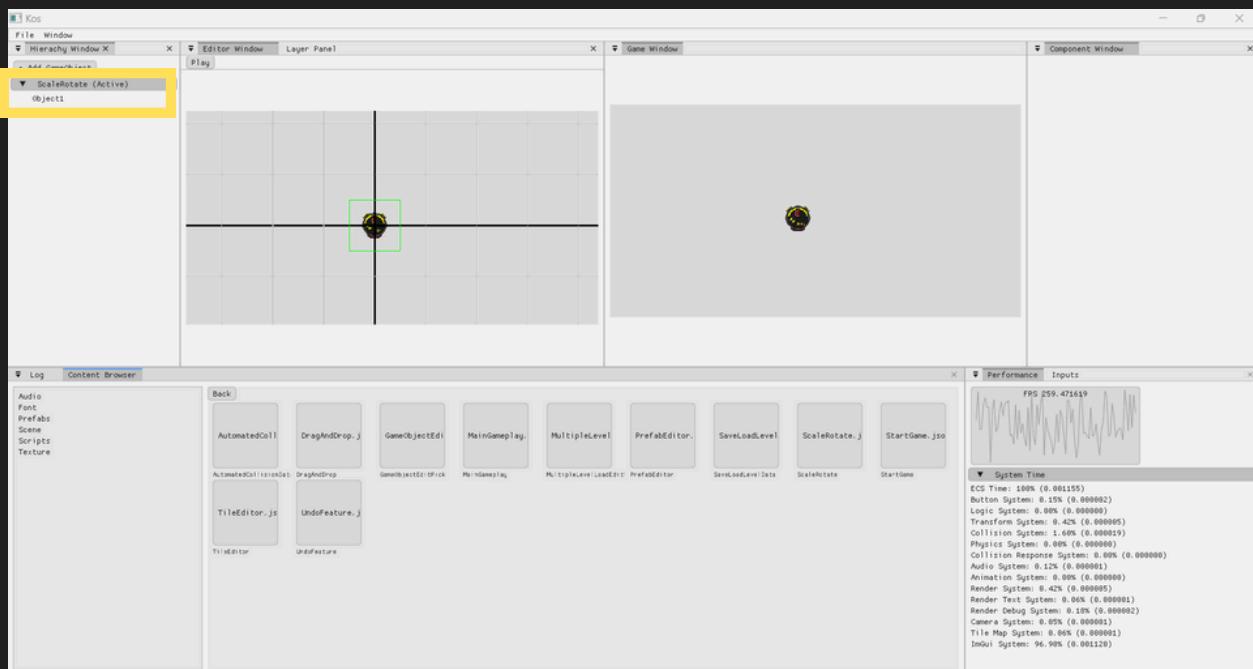
• MISC TUTORIALS

HOW TO USE

CHANGING OF SCENES



DOUBLE CLICK ON THE SCENE TO SWITCH SCENES



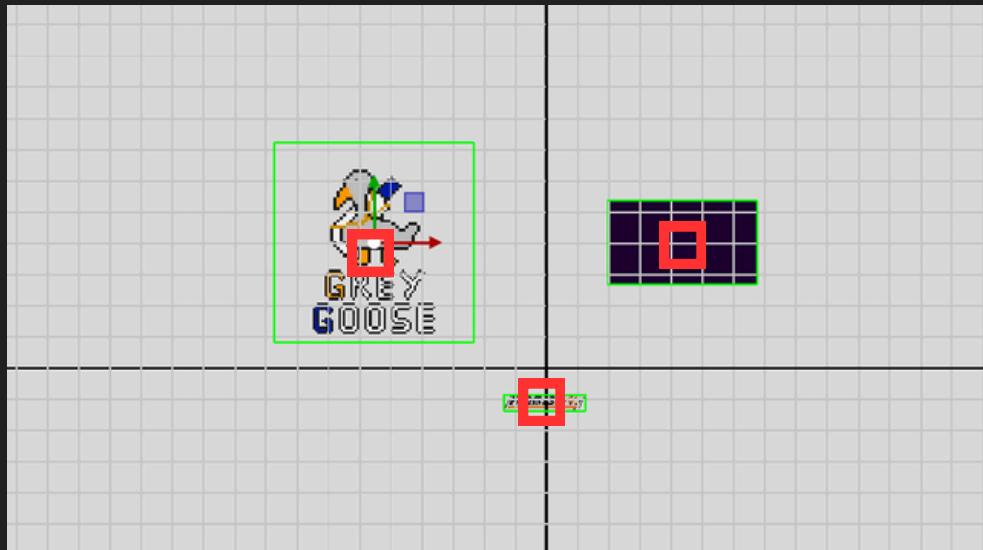
GREY GOOSE



- **MISC TUTORIALS**

HOW TO USE

GAME OBJECT PICKING



Pick a game object directly from the editor window by directly clicking on the object's world coordinates. (Centered for most objects)

Red spots indicate where to click to pick the object.

GREY GOOSE

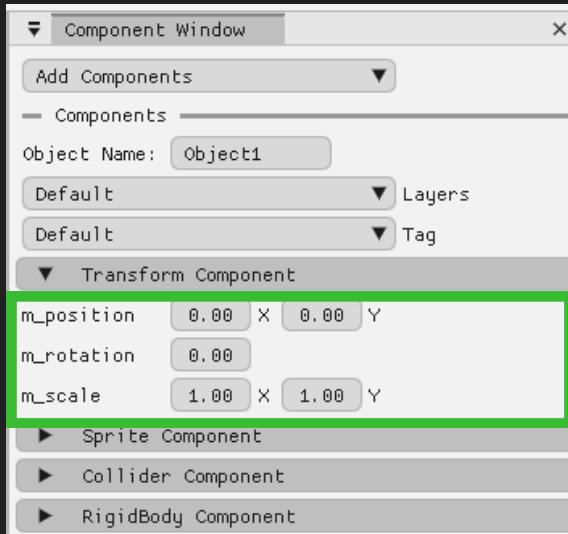
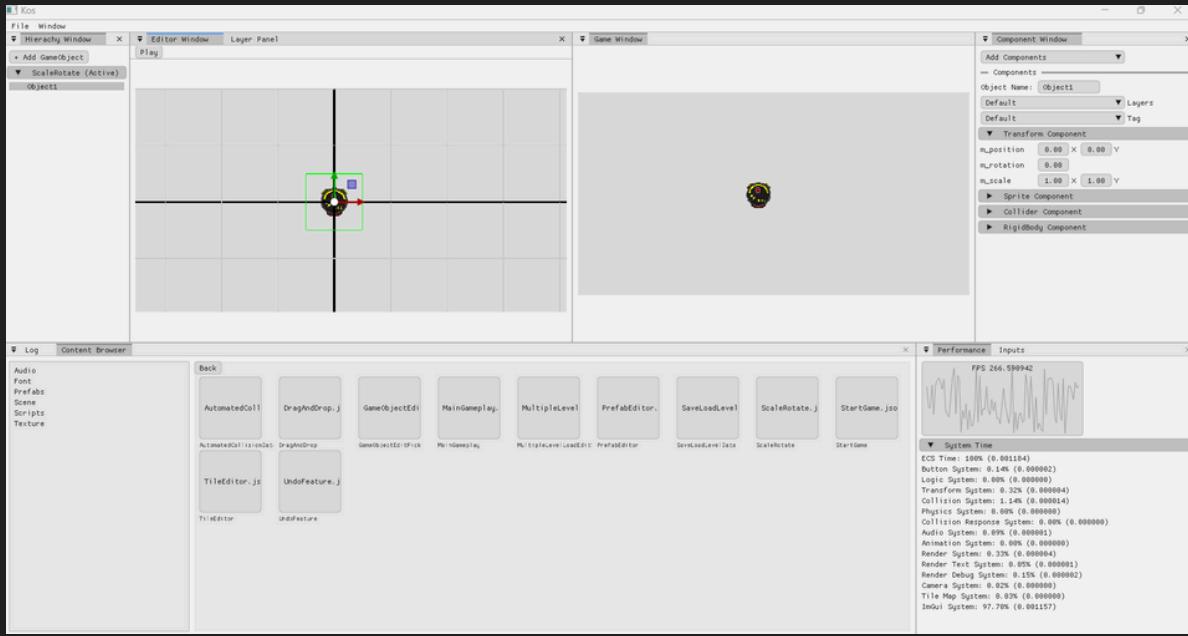


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HOW TO USE

SCALE, ROTATE AND TRANSLATE

Load the ‘ScaleRotate’ scene by double clicking on it



Adjust the position, rotation, scale by dragging or inputting.

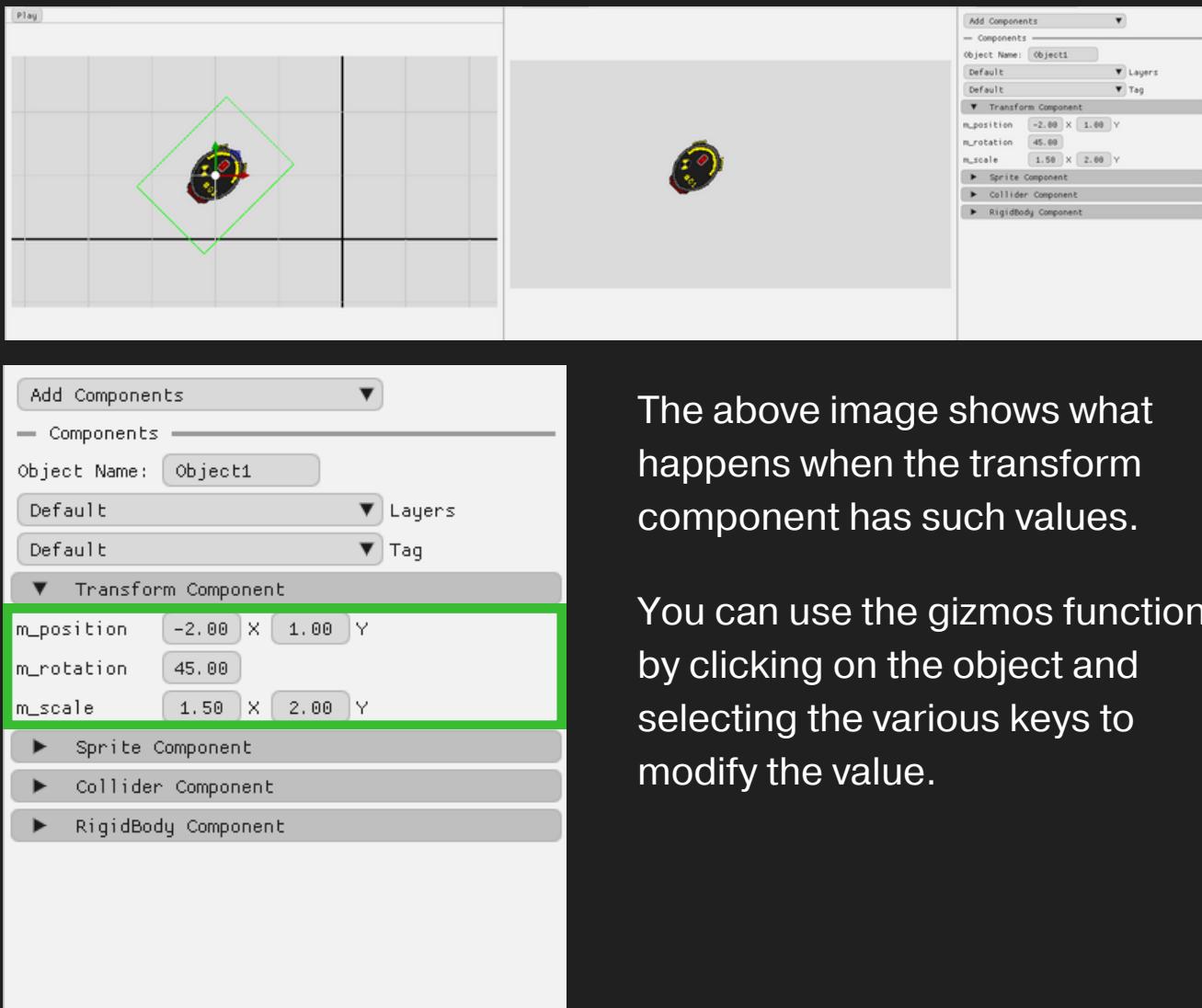
GREY GOOSE



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HOW TO USE

SCALE, ROTATE AND TRANSLATE



The above image shows what happens when the transform component has such values.

You can use the gizmos function by clicking on the object and selecting the various keys to modify the value.

GREY GOOSE



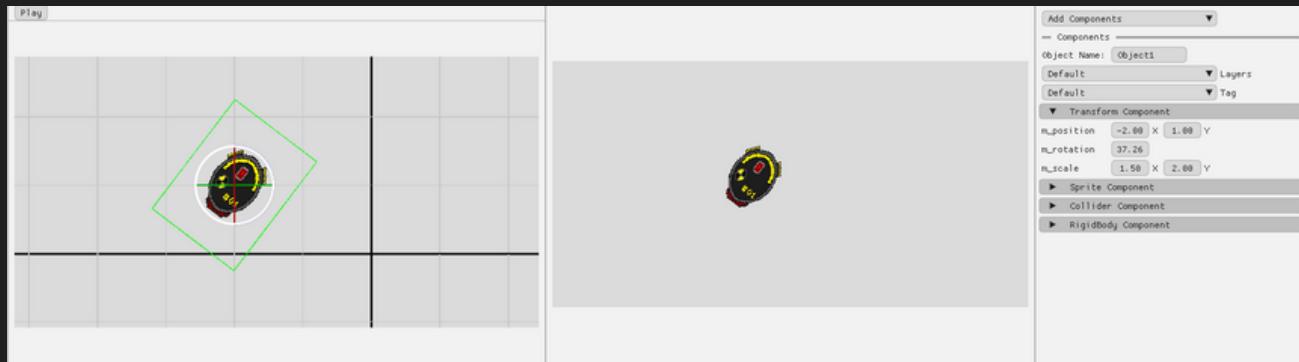
- **MISC TUTORIALS**

HOW TO USE

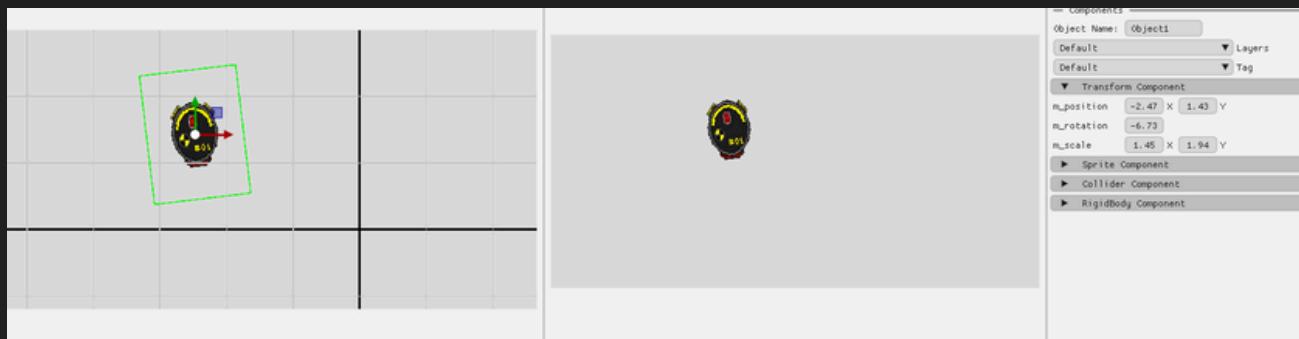
SCALE, ROTATE AND TRANSLATE

You can use the gizmos function by clicking on the object and selecting the various keys to modify the value.

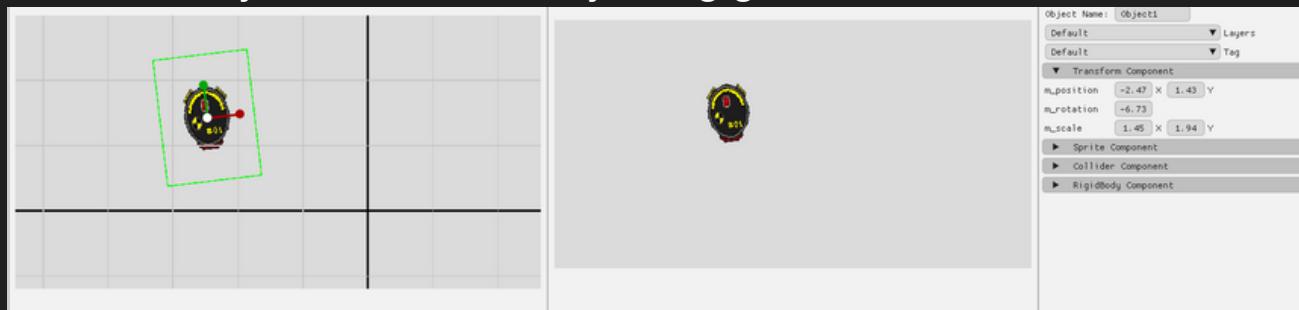
Press ‘E’ key to rotate using gizmos



Press ‘W’ key to translate using gizmos



Press ‘R’ key to scale uniformly using gizmos



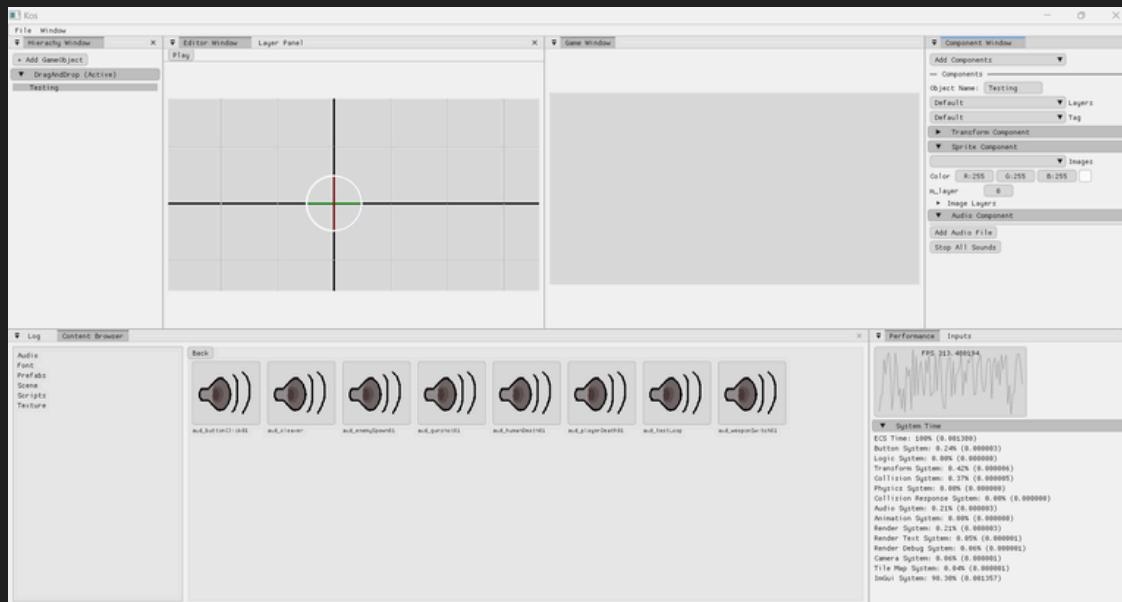
GREY GOOSE



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HOW TO USE

DRAG AND DROP ART/AUDIO FILES

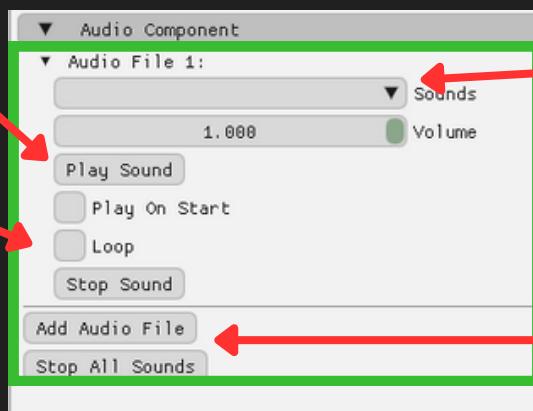


LOAD THE DRAG AND DROP SCENE BY DOUBLE CLICKING “DRAGANDDROP” ON IT

IN THE CONTENT BROWSER CLICK ON AUDIO FOLDER

AUDIO COMPONENT

PLAY THE SOUND



CLICK THE DROP DOWN TO SELECT THE AUDIO

YOU CAN ADJUST THE VOLUME OF THE SOUND

ABLE TO LOOP/STOP THE SONGS

ABLE TO ALLOW AN ENTITY TO PLAY MULTIPLE AUDIO

GREY GOOSE



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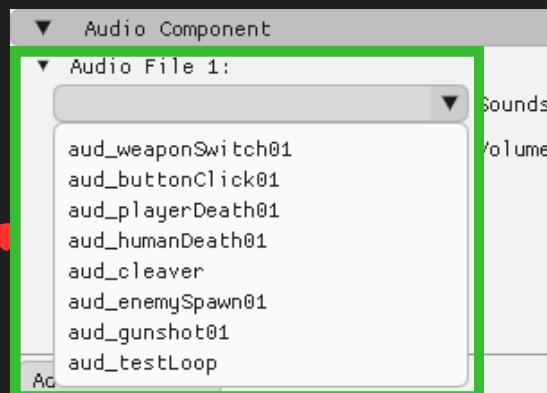
HOW TO USE

AUDIO COMPONENT



Step 1: Add New Audio File

- Drop the file into assets/audio/.
- Open the Content Browser or ImGui interface to see the file.



Step 2: Assign Audio File to an entity

- Select the audio file in ImGui.
- Set properties like Play On Start, looping, and volume.



Step 3: Test Playback

- Use ImGui to play, pause, or stop the sound.
- Adjust settings live to see how it interacts with your entity.

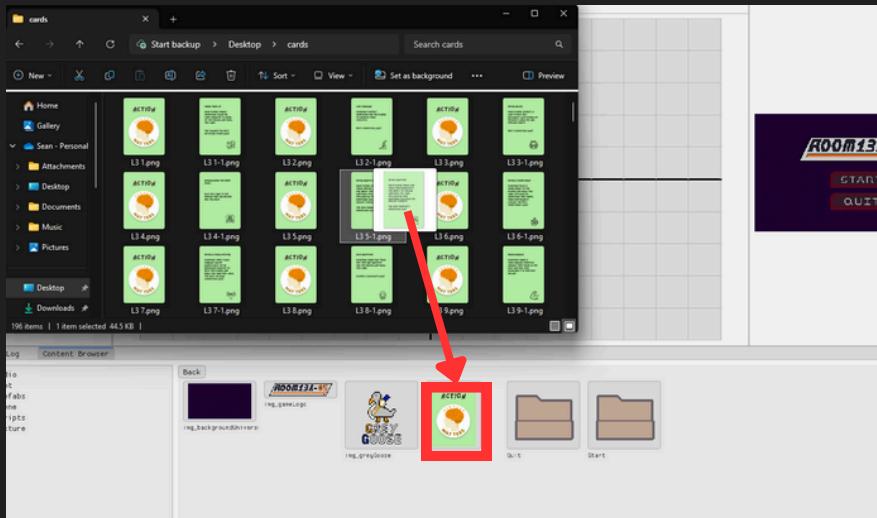
GREY GOOSE



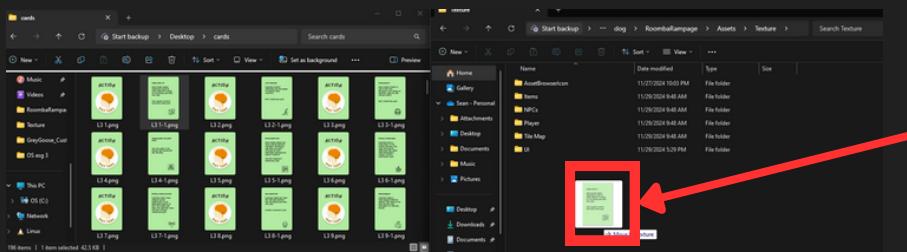
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HOW TO USE

ART



DRAG IMAGES DIRECTLY FROM THE WINDOWS EXPLORER TO THE CONTENT BROWSER TO LOAD THEM DURING RUN TIME



DRAG IMAGES DIRECTLY FROM THE WINDOWS EXPLORER TO THE ASSET FOLDER TO LOAD THEM DURING COMPILE TIME



THE IMAGE WILL NOT LOAD DURING RUN TIME, INSTEAD IT NEEDS TO BE MANUALLY LOADED BY RIGHT CLICKING THE CONTENT BROWSER AND SELECTING RELOAD.



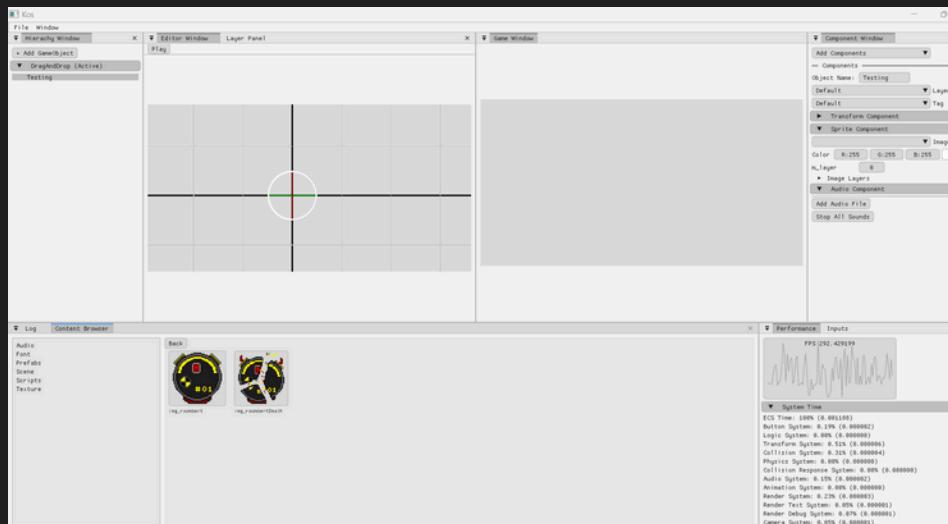
AFTER RELOADING, ANY IMAGES LOADED FROM OUTSIDE THE ENGINE WILL BE LOADED INTO THE CONTENT BROWSER

GREY GOOSE



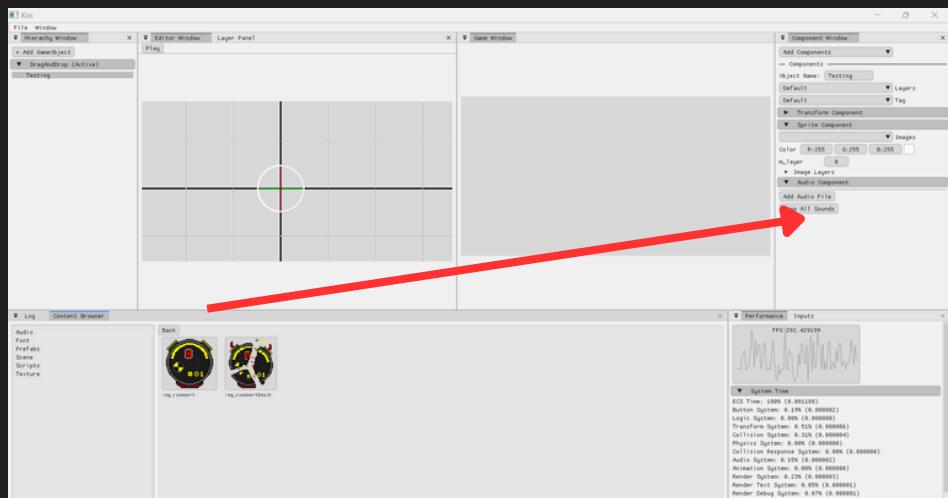
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ASSET

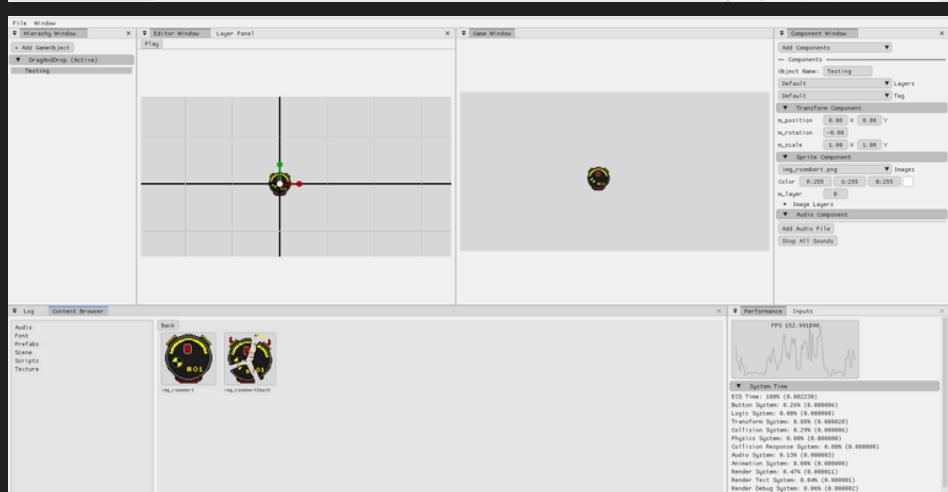


HOW TO USE

IN THE CONTENT BROWSER
CLICK ON TEXTURE FOLDER AND
CLICK ON THE PLAYER FOLDER



DRAG THE TEXTURE TO THE
EDITOR WINDOW/SPRITE
COMPONENT TO LOAD THE
TEXTURE



ENTITY WILL NOW HAVE THE
TEXTURE

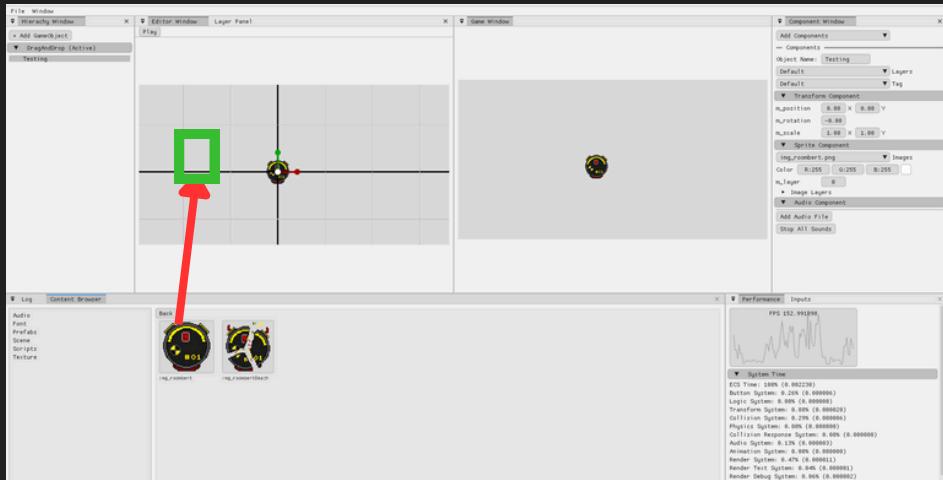
GREY GOOSE



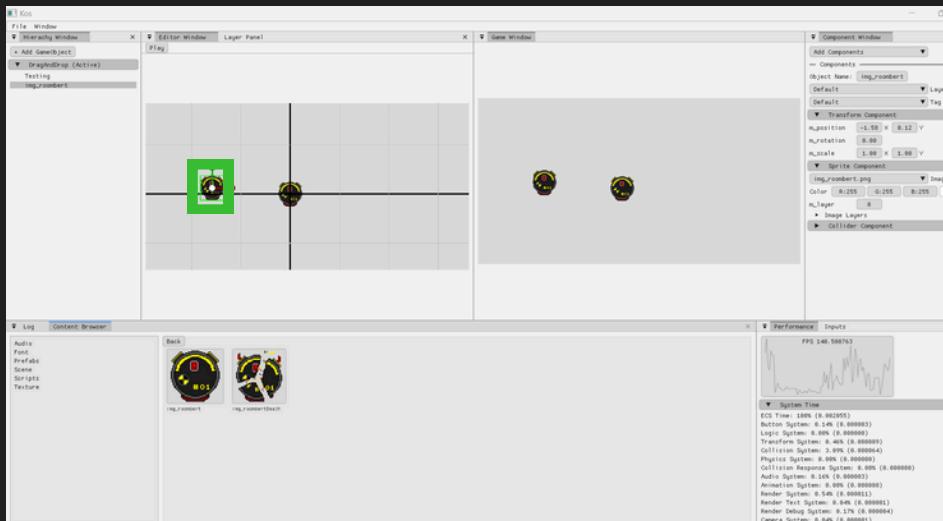
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HOW TO USE

ASSET



DRAZING THE IMAGE TO ANYWHERE OF THE EDITOR WINDOW WILL CREATE AN ENTITY WITH THAT TEXTURE



AS SHOWN HERE

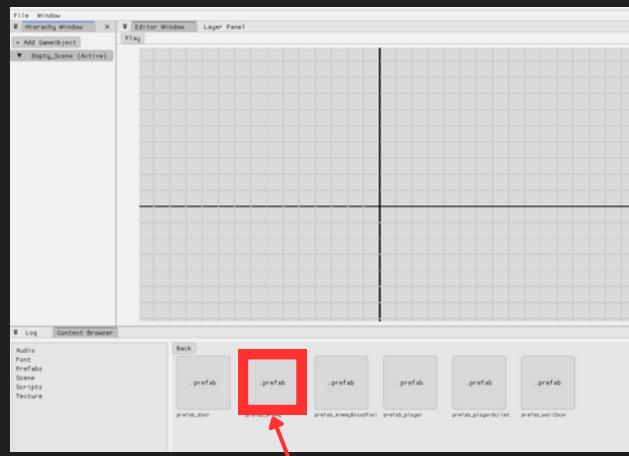
GREY GOOSE



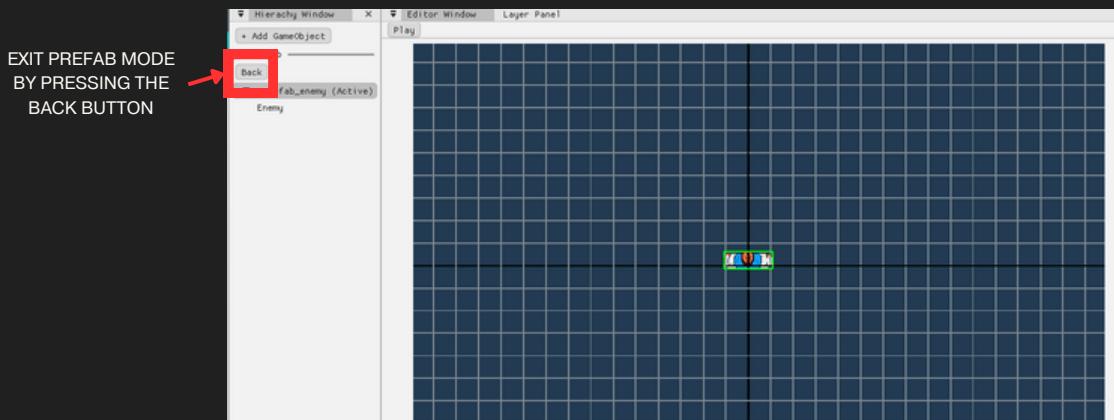
• MISC TUTORIALS

HOW TO USE

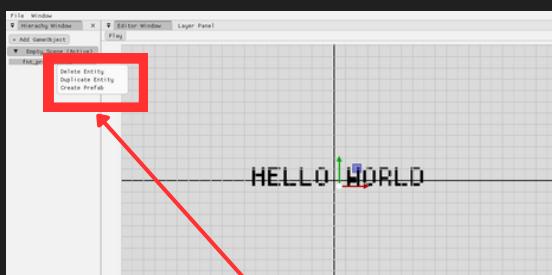
PREFAB EDITOR



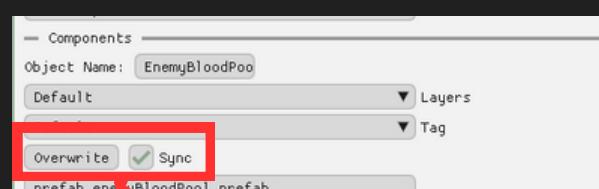
ENTER PREFAB MODE BY DOUBLE CLICKING A PREFAB OBJECT WITHIN THE CONTENT BROWSER



ANY CHANGE MADE TO THE PREFAB WILL BE SAVED AND ALL EXISTING PREFABS OF THIS TYPE WILL BE UPDATED ACCORDINGLY.



CREATE NEW PREFABS BY RIGHT CLICKING AN OBJECT INSIDE THE HIERARCHY WINDOW AND SELECTING "CREATE PREFAB". ALL NEW PREFABS WILL BE SAVED UNDER THE PREFAB FOLDER IN THE CONTENT BROWSER.



IF A PREFAB IS EDITED OUTSIDE THE PREFAB EDITOR, SELECTING OVERWRITE WILL UPDATE ALL EXISTING PREFABS OF THE SAME TYPE IF SYNC IS ON. E.G. ADDING A SCRIPT OUTSIDE THE EDITOR, PRESSING OVERWRITE WILL ADD THE SCRIPT TO ALL PREFABS OF THE SAME TYPE

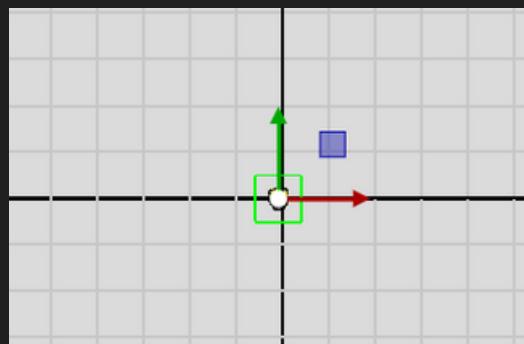
GREY GOOSE



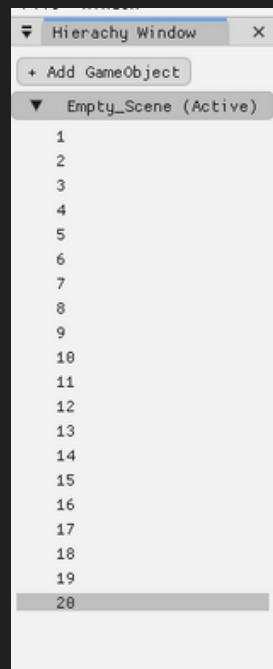
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HOW TO USE

UNDO FEATURE



PERFORM DIFFERENT TRANSFORMATIONS BY USING THE GIZMOS OR THE COMPONENT PANEL. UNDO THE TRANSFORMATIONS TIMES BY PRESSING CTRL+Z.



ADD ENTITIES THROUGH THE HIERARCHY WINDOW. UNDO THE ADDING BY PRESSING CTRL + Z FOR EACH ENTITY. RE-ADD THE ENTITY BY PRESSING CTRL + Y FOR EACH ENTITY

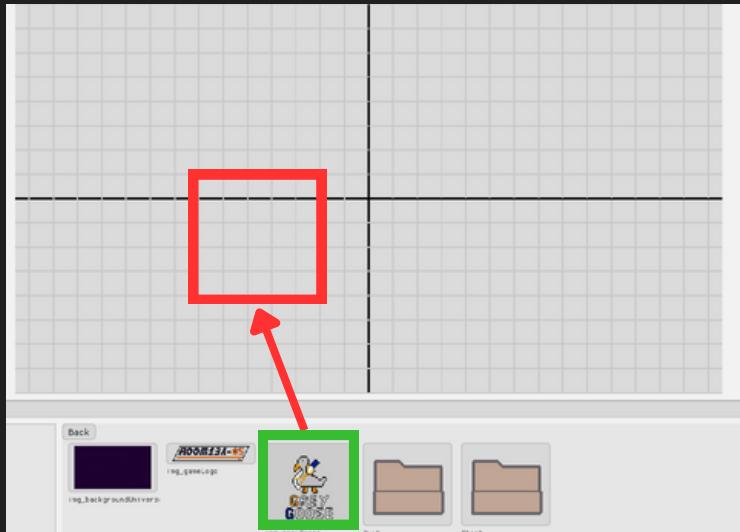
GREY GOOSE



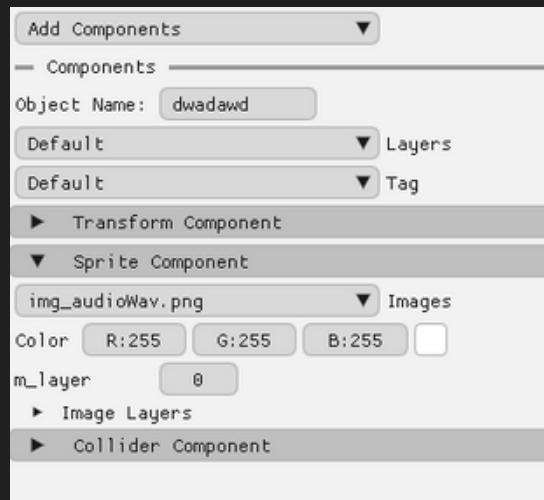
- MISC TUTORIALS

HOW TO USE

AUTOMATED COLLISION DATA



SIMPLY DRAG AND DROP TEXTURES FROM THE CONTENT BROWSER TO OBSERVE AUTOMATIC BOUNDING BOX COLLISION DATA HANDLING



ADDING A COLLIDER COMPONENT WHEN A SPRITE COMPONENT IS ACTIVE WILL ALSO PERFORM AUTOMATIC COLLISION DATA.



COLLISION SIZE IS BASED ON IMAGE SIZE AND WILL CONSIDER TRANSPARENT PIXELS AS PART OF ITS SIZE

GREY GOOSE

