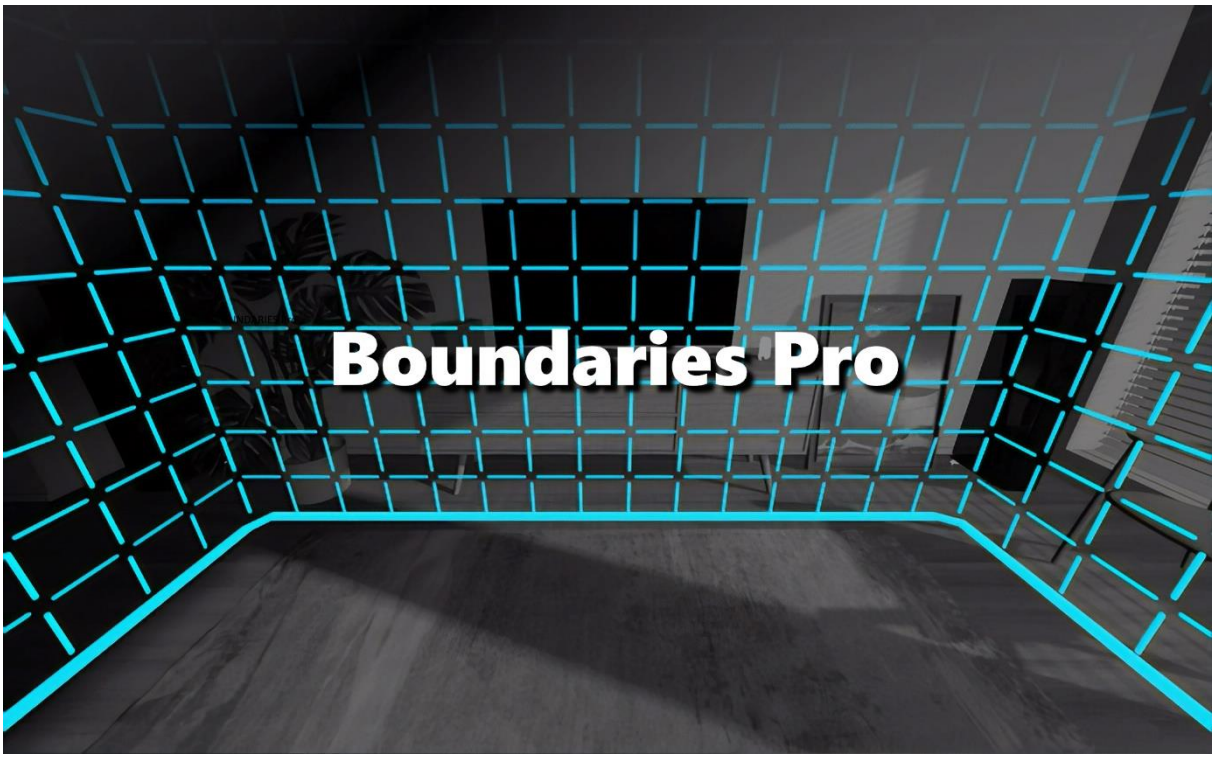
Boundaries Pro

Boundary Detection & Chaperone System

Welcome to the Boundaries Pro, a simple yet robust Unity package that lets you set up and visualize boundaries in your game environments.
Whether it's keeping players within certain zones, visualizing areas of interest, or integrating a Chaperone-like system akin to VR setups, Boundaries Pro has you covered.



1. Features:

Boundary Detection

Set up a boundary box and detect whether a GameObject with the PlayerBoundariesCheck component or any transform is within this box.

Chaperone System

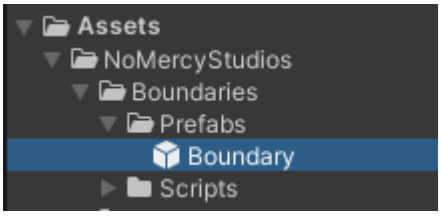
Inspired by VR Chaperone system, Boundaries Pro provides an advanced grid highlighting feature. As objects approach the boundary, a grid or any designated texture appears, alerting the player or developer.

2. Getting Started:

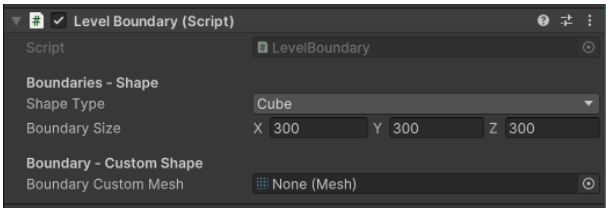
2.1. Setting Up Boundaries:

The simplest way to use the Boundaries system is to drag&drop the "Boundary" prefab located at "NoMercyStudios\Boundaries\Prefabs" directly in your scene for example.

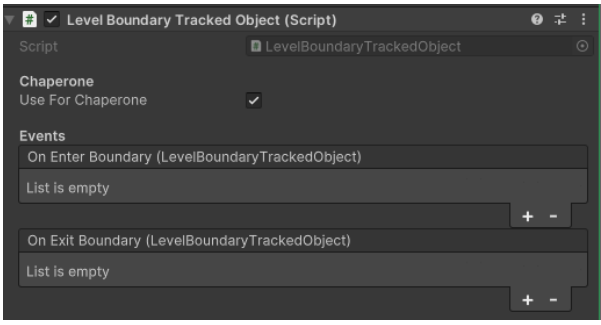
You can move it around, rotate it & play with the different values it exposes.



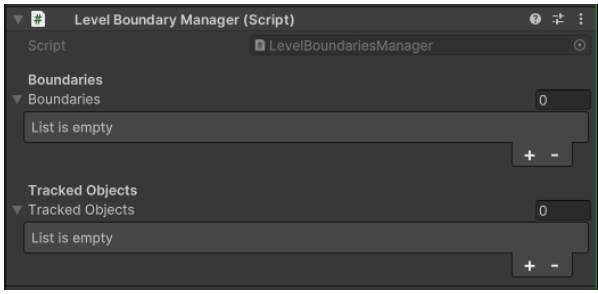
1. The LevelBoundary script it contains will automatically search for a BoundariesManager gameobject with the LevelBoundariesManager attached on it.
   Note: If not found, it will create it automatically.



2. Now, if you want to track an object, attach the script LevelBoundaryTrackedObject to your player or to a new child of your player for example.



3. The LevelBoundariesManager is a singleton script to which each LevelBoundary & each LevelBoundaryTrackedObject will register themselves automatically.



You can then for example check if any of the LevelBoundaryTrackedObject is inside one of the LevelBoundary by calling the function:
`LevelBoundariesManager.Instance.`IsInsideAnyBoundary(trackedObject);

2.2. Implementing the Chaperone System:

If you check the either the prefab located at "NoMercyStudios\Boundaries\Prefabs" or search for the "Chaperone" objects in the various sample scenes, you'll be able to find the script LevelBoundaryChaperone which relies a lot on the LevelBoundary which dictates the mesh of the chaperone.

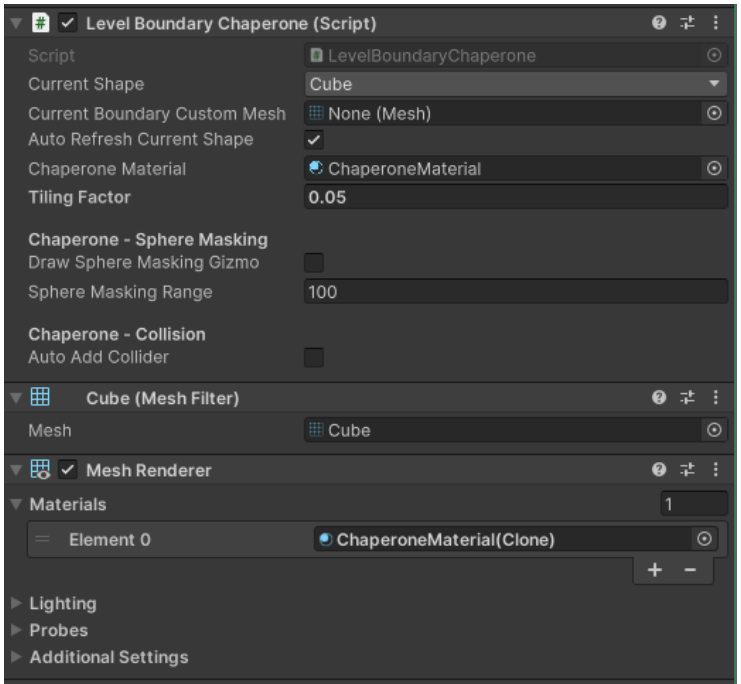
Some shapes are automatically generated (& you can also *import your own mesh* if it's useful):

- Cube
- Sphere
- Hemisphere
- Cylinder

Please don't hesitate to play with its various values from the inspector.:
- Assigning the desired grid texture or any texture to the chaperoneMaterial of your renderer.
- Adjust the tilingFactor to determine how frequently your texture tiles across the boundary plane.
- Use the sphereMaskingRange to set the radius in which the grid will appear as the player approaches the boundary.

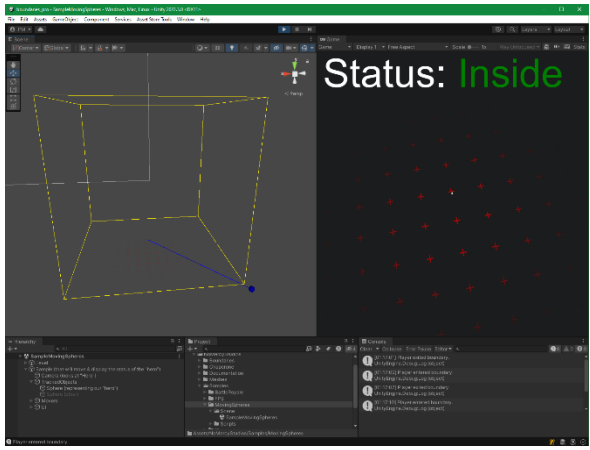
EXPERIMENTAL
In the "FPS" sample, I wanted to showcase the possibility to create intersect multiple boundaries. I had to find a way to create "corridors" dynamically inside intersecting chaperone. This is possible thanks to the script MergedLevelBoundariesChaperone (find the object "GlobalChaperone") which takes all or some LevelBoundaries[] & merges them through Boolean operations during runtime.

Note:
If you run into some issue, don't hesitate to play with the "shape" of the LevelBoundary (check the paren object) or just reset the material of the MeshRenderer to "None".

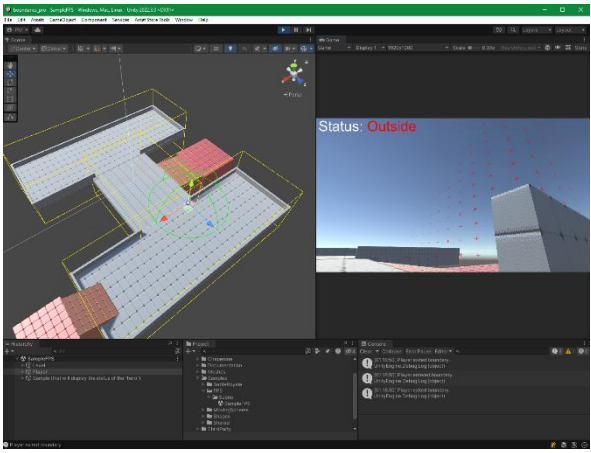


4. Samples

In the “NoMercyStudios/Samples” folder, you will find the scenes for the various samples.



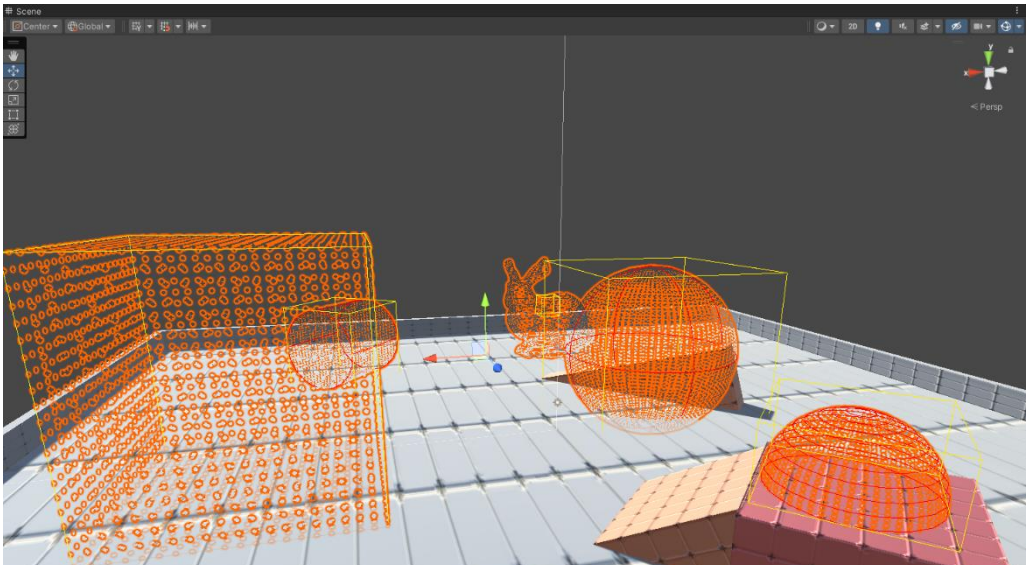
🔷 **Moving Sphere:** Initially designed for the creation of this asset & its integration in my project based on the "Space Combat Kit" from the Unity Asset Store, this sample features a sphere moving in and out of a boundary shaped like a box.
It provides insights into boundary interactions and is a great starting point for understanding the system's workings. However, please ensure you inspect the code and the scene for a deep dive.



🔷 **FPS:** Explore dynamically generated corridors using a custom-made basic FPP controller. Check into the "GlobalChaperone" located under the "Level / Boundaries" game objects hierarchy and try turning on its “autoAddCollider” property 😊

🔷 **BattleRoyale:** A variation of the previous scene, experience a dynamic Battle Royale environment. This sample showcases a hemisphere that periodically re-centers and resizes itself, mimicking the shrinking zones found in games like PUBG and Fortnite.
I'm thinking about some minigame to it!

🔷 **Shapes:** Scene which displays the boundaries & the chaperone system for all the supported shape types (including the Stanford Rabbit !)



4. Customization:

Dynamic Highlighting

In the LevelBoundaryChaperone component

Adjust the sphere masking range to control the distance at which the chaperone grid becomes visible.

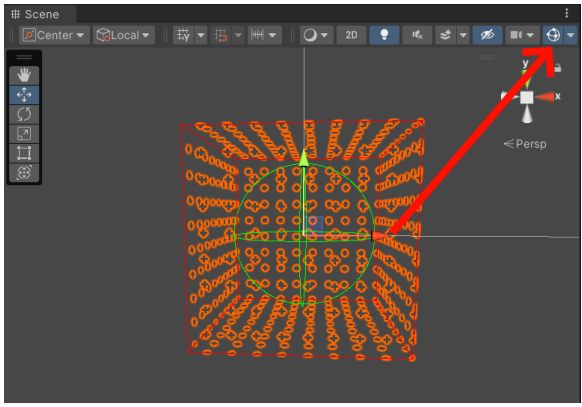
Custom Grids

In the LevelBoundaryChaperone component

Simply replace the material in the Chaperone component to use your own textures or designs.

Debugging

Enable the drawing of gizmos the "Scene" window of the Unity editor to visualize boundary zones and sphere masking radii.



5. Performance and Optimization:

The Boundaries Pro package is designed with performance in mind.
The checks and visualizations are optimized to ensure minimal overhead, allowing for seamless integration into any project without affecting the game's performance.

6. Support:

Please read the C# source code that is entirely provided.
If you are not a programmer, please reach out to me & I'll try to help you or rework the asset !

I've done my best to keep it appropriate regarding all the topics but, I'm always keen to learn & this asset will improve I hope with your support. I want to thank you again!

Let's discuss on the official forum page:
https://forum.unity.com/threads/boundaries-pro-including-chaperone-system.1506548/

In any case, for any questions, bug reports, or feature requests, please contact
nomercy.studios@outlook.com