Reverse Perspective Camera v2.0

by Torec Studio



Features

- A camera component that allows smooth transitions between projection modes: from standard perspective, through orthographic projection, to reverse perspective.
- Utilizes a custom projection matrix.
- **NB!** This asset is **not backward compatible** with v1.0 (2017), as the camera setup method has been changed (pivot object is no longer used).
- Supports depth buffer, ensuring shadow rendering.
- Includes code functions for handling the custom projection matrix: `RPWorldToScreenPoint`, `RPScreenToWorldPoint`, `RPScreenPointToRay` (and their viewport equivalents).

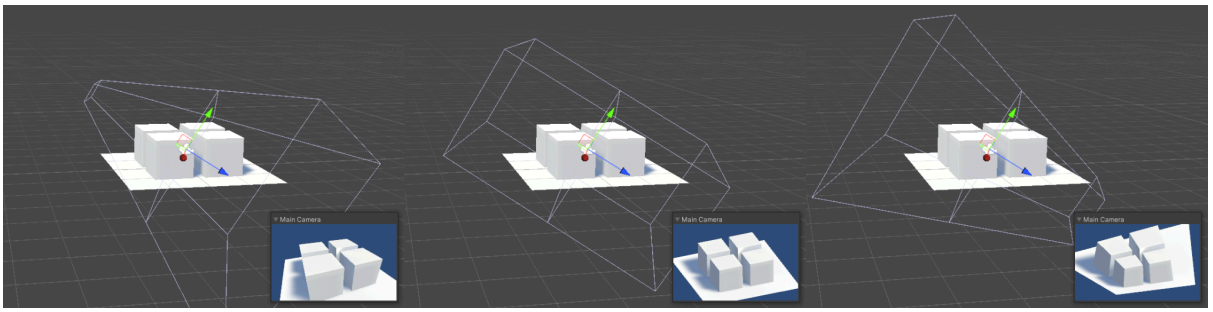
Implementation

The geometry of the reverse perspective effect is best illustrated through the structure of the frustum. Within this frustum, three key planes are defined:

- **Min/Max Planes** (similar to traditional near/far planes)
- **Zero-Plane** (remains constant and serves as a reference plane)

When adjusting the perspective value:

- The size of the min/max plane rectangles changes accordingly (see the picture).
- In reverse perspective mode, the **min plane rectangle** is **larger** than the max plane rectangle.
- The **Zero-Plane rectangle** remains a constant size. It is defined by the `Size` parameter of the Camera component. Objects positioned at the zero-plane do not change size when modifying the perspective value.



The position and direction of the camera define the zero-plane, meaning the camera should be placed at the center of the scene to align the zero-plane with objects of interest (a key difference from version 1 of the asset).

The **RP Camera component** determines z-space boundaries using min/max planes, similar to near/far planes in conventional cameras. However, **near/far clipping planes** remain independent from min/max planes to preserve proper shadow rendering.

Settings

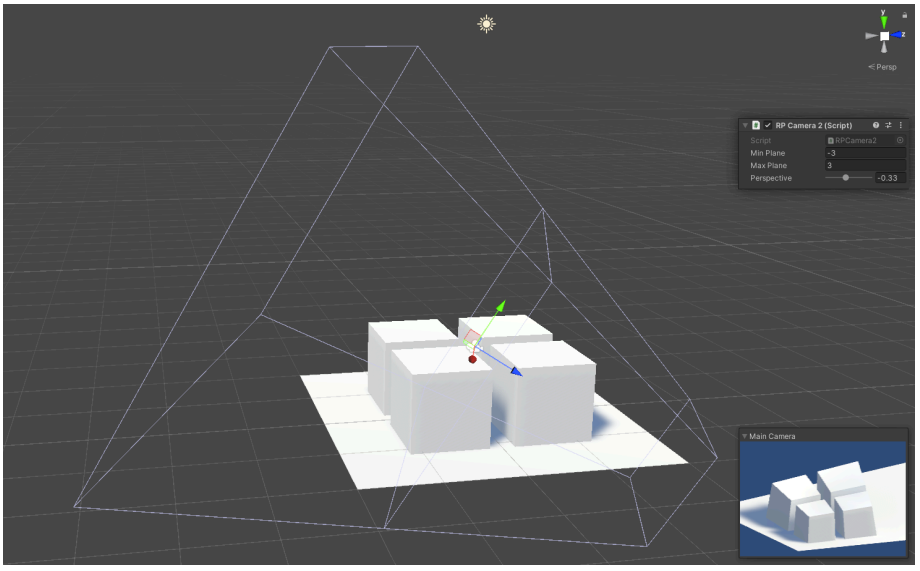
To configure the perspective, use the following settings:

RPCamera Component:

- **Perspective** – Positive values for standard perspective, `0` for orthographic projection, and negative values for reverse perspective.
- **Min/Max Plane** – Defines the frustum bounds and affects the depth buffer calculations (similar to near/far planes but specific to this projection system).

Camera Component:

- **Projection** – Must be set to **Orthographic** (to allow negative near-plane values).
- **Size** – Defines the size of the zero-plane.
- **Clipping Planes** – Still affect shadow mapping as they define the depth range used in shadow calculations.



Limitations

Some behaviors cannot be overridden (e.g., if they are built into Unity or standard shaders), which introduces certain inconveniences and limitations:

- **Unity renders the frustum** of the standard Camera component in its own way, making it invalid after modifying `projectionMatrix`. It is recommended to hide it in the Gizmos menu.
- **Shadow calculation** is unpredictably influenced by Unity's handling of near/far plane settings, affecting shadow strength near clipping planes (likely due to the linearization of Z buffer values).
- **Built-in RP only** – The asset is designed for the Built-in Render Pipeline; URP has a more complex shadow processing system and is not fully supported.

Changes for Release 2.0.0

- **Pivot object support removed** – The camera setup no longer relies on a separate pivot object.
- **Depth buffer support added** – Depth buffer now functions according to the min/max plane settings, enabling proper shadow rendering.
- **New functions implemented** – `RPWorldToScreenPoint`, `RPScreenToWorldPoint`, `RPScreenPointToRay` (along with their viewport equivalents) have been defined.

Why It Became Paid

For those who have been using this script since 2017 when it was free:
Sorry, guys, this is an experiment to see if people actually use my script or just download it without trying it.
I've set the lowest possible price.

Related Links

[Reverse Perspective - Wikipedia]

Support

For any questions or support, please contact:

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