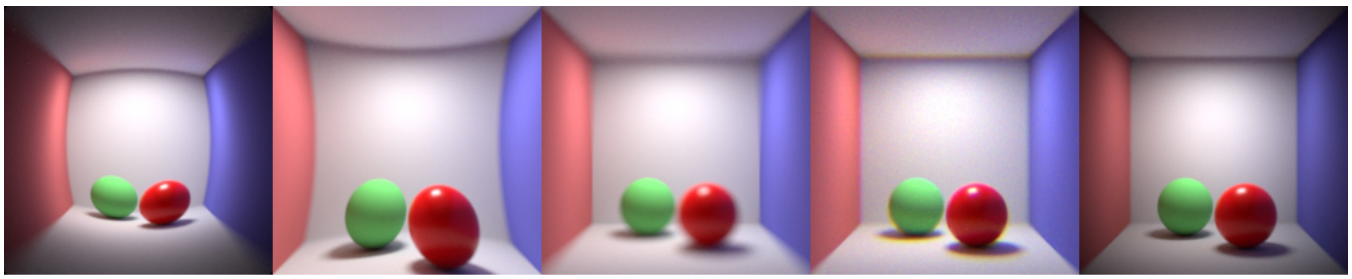
PxrCamera

A camera model that approximates a number of real world physical effects. This supports all of the traditional prman perspective camera settings including shaped motion blur and bokeh.

Some examples of the effects PxrCamera can do:



Parameters

Standard Perspective

fov

Field of view (FOV) in degrees. For rectangular images this is normally the FOV along the narrower image dimension.

fov (end)

Field of view (FOV) in degrees. Used to motion blur fast zooms. 0.0 means it is the same during the rendering

F-stop

Aperture size, controls depth of field blurriness. High values emulate a pinhole camera and depth of field is disabled.

Focal Length

The focal length of the camera in scene units measured from the camera lens. High F-stop values disable this.

Focal Distance

Distance to the focal plane where objects are in focus, measured in scene units from the camera to the object. High F-stop values disable this.

Tilt-Shift

tilt

Angle in degrees to tilt the lens. Makes the plane of focus non-parallel to the image plane. Has no effect unless depth of field is enabled. Positive tilts up, bringing the focus in the top of the image closer and pushing the focus in the bottom further. Negative does the reverse.

roll

Roll the lens clockwise. If the lens tilt is non-zero this can be used to rotate the plane of focus around the image center.

Focus 1, 2, and 3

These point coordinates define an arbitrary plane (3 points is a triangle). This is used as the arbitrary focal plane. Note that a plane very oblique to the camera may fail to render.

shiftX

Shift the lens horizontally. This can be used to correct for perspective distortion. Positive values shift towards the right.

shiftY

Shift the lens vertically. This can be used to correct for perspective distortion "keystone" effects. To keep vertical lines parallel, aim the camera horizontally and adjust this to include the subject. Positive values shift towards the top.

Lens Distortion

radial1

Quadratic radial lens distortion coefficient. Positive values produce pincushion distortion. Negative values produce barrel distortion.

radial2

Quartic radial lens distortion coefficient. Positive values produce pincushion distortion. Negative values produce barrel distortion.

assymX

Distortion applied only in the X direction. Horizontal lines will remain straight. Positive values produce pincushion-like distortion. Negative values produce barrel-like distortion.

assymY

Distortion applied only in the Y direction. Vertical lines will remain straight. Positive values produce pincushion-like distortion. Negative values produce barrel-like distortion.

squeeze

Anamorphic lens squeeze. Values greater than one decrease the effect of the lens distortion in the X direction. Values less than one increase it.

Chromatic Aberration

transverse

Transverse (or lateral) chromatic aberration. This specifies the magnification factors for the red, green, and blue primaries respectively. When unequal, this can produce a tinge which is most pronounced near the image edges. It will increase color noise, however.

axial

Axial (or longitudinal) chromatic aberration. This specifies the chromatic focal shift for the red, green, and blue primaries respectively. When unequal, this can produce a tinge on bokeh and out of focus objects. It will increase color noise, however.

Vignetting

natural

Natural vignetting. When one, directions off of the primary camera axis will be darkened realistically. Wide-angle perspectives will show this effect more strongly. Setting to zero disables this and intermediate values will blend accordingly.

optical

Optical vignetting. Simulates light blockage due to a hood or other additional lens elements. With depth of field enabled, this creates cat's eye bokeh. However, it also increases image noise.

Shutter

sweep

Shutter direction. Specifies the direction that the shutter sweeps. The default, down, is the most common direction for rolling shutters.

duration

Exposure duration. Zero means an ideal rolling shutter where each line is exposed instantaneously when read. The default, one, is equivalent to a global shutter where all lines are exposed and read at the same time.

Advanced

Detail Bias

Higher values shift texture mipmaps and dicing to coarser levels, or less detail. Negative increase details for both. Adjust in small increments.

Enhancement

Selecting a screen area (X and Y) you can embiggen (zoom) by Z amount. This maintains all other parts of the render including mipmap levels, dicing, etc. It only changes the rays to zoom into this area leaving all else the same. This is useful as a diagnostic tool to see details smaller than a pixel that may flicker or change in undesired ways (like finding geometry popping or details changing).

Matte File

This is used to take a deep EXR to generate a matte for the termination of rays, in this way it's similar to a generalized clipping plane. The supplied file must be an EXR and can be Deep Data or a shallow EXR (with included alpha). If it is deep data then we set the rays to terminate where the data becomes opaque, cutting away anything behind them in the render. Semi-transparent areas are importance sampled based on the depth and level of transparency. This can improve performance by skipping shading and tracing of rays. If using a shallow EXR with alpha, we terminate rays on opaque areas immediately and allow them where transparent. If there is partial transparency we stochastically sample based on the level of transparency. The shallow EXR method operates a lot like a render mask.