Mirrors with realtime reflections

Inhaltsverzeichnis

1 General information

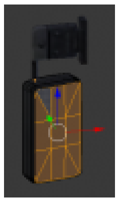
Regarding the real-time reflections for (rear) mirrors, the following things should be noted:

- For each rear-view mirror, a separate entry must be created under "Real-time mirrors". However, each entry there costs performance as long as the corresponding mirror is in the field of view, since it represents a separate rendering process. If two mirrors are close to each other and have a similar orientation, you can "trick" them by "splitting" a texture (by adapting the mapping of the individual mirror objects).
- The mirror camera is placed in the middle of the mirror and aligned perpendicular to the mirror surface. The calculation of the final angle based on the position of the user camera is done by LOTUS.
- Each mirror camera is rendered only if the center point (plus the specified radius) is within the field of view of the user camera. Mirror cameras are currently only rendered if the user is in an interior view.
- The created texture is explicitly used as "normal" texture! Not as reflection texture or similar! The simulation of the reflection is already done while rendering the texture.
- Likewise, all lighting effects of the mirror surface are deactivated, because the current lighting is directly derived from the rendered texture.

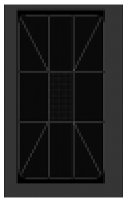
2 Execution

2.1 Blender

A typical rear view mirror can look like this:



The mirror surface must be given its own "dummy" texture. It should have a favorable aspect ratio (here 1:2), so that it can be mapped onto the mirror surface as full as possible:



Each mirror should have its own dummy texture so that separate materials can be created in the ContentTool.

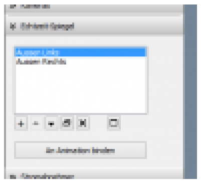
2.2 Script

In the script, an integer public variable named `mirrortex_#` (# = index of the mirror, starting from 0) must be created for each mirror texture, into which LOTUS can write the texture ID and which can then be accessed by the material properties. So if the vehicle has three mirrors:

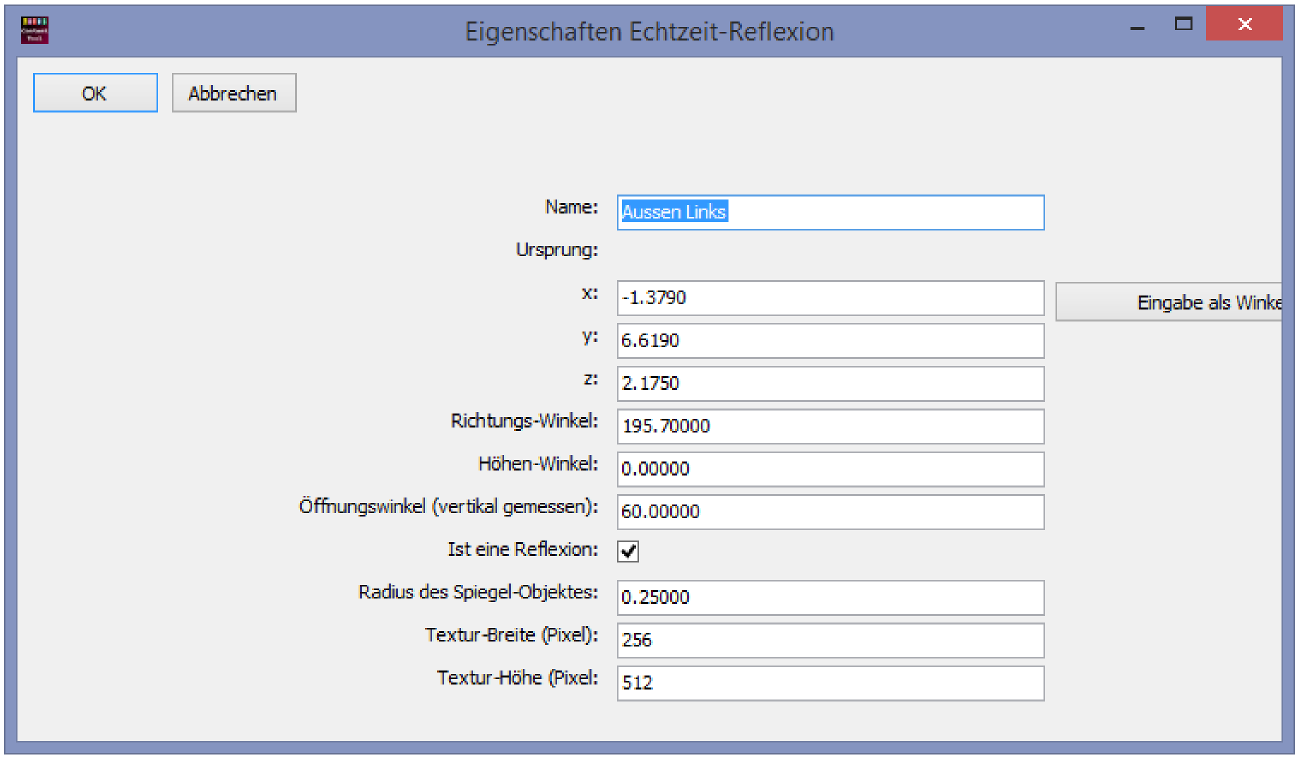
```
mirrortex_0: integer;

mirrortex_1: integer;

mirrortex_2: integer;
```

2.3 ContentTool

Now you have to create an entry for each mirror in the "Real-time mirror" section on the left:



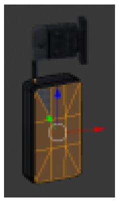
Each mirror has the following parameters:


Eigenschaften Echtzeit-Reflexion

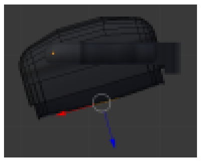
OK | Abbrechen

Name:	Aussen Links	
Ursprung:		
x:	-1.3790	Eingabe als Winke
y:	6.6190	
z:	2.1750	
Richtungs-Winkel:	195.70000	
Höhen-Winkel:	0.00000	
Öffnungswinkel (vertikal gemessen):	60.00000	
Ist eine Reflexion:	✓	
Radius des Spiegel-Objektes:	0.25000	
Textur-Breite (Pixel):	256	
Textur-Höhe (Pixel:	512	

- Name: Only for the list
- Origin: Center of the mirror surface and point from which the mirror camera "looks":

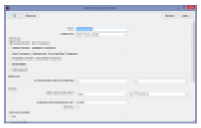


- Direction and elevation angle: The orientation of the mirror surface normals - in the following picture the blue arrow:



- Opening angle: How large is the field of view of the mirror?
- Is a reflection: No monitors are supported yet - but later this parameter will help to distinguish between mirrors and monitors (e.g. the perspective of the surveillance camera does not change when the perspective of the user camera changes 😉)
- Radius of mirror object: If the center of the mirror surface moves out of the field of view, LOTUS would immediately stop rendering. The rest of the mirror could still be in view and freeze visibly. To avoid this effect, this radius is specified as a tolerance limit.
- Texture width and height: The resolution of the texture into which the rendering is to be done. This automatically results in the aspect ratio with which the mirror image is to be rendered.

Finally, the material must be configured accordingly:



- "Direct Texture" is recommended as material type, because all light effects are already realized directly via the reflection texture. If it gets dark outside, the mirror image will darken by itself 😉
- For the texture, the check mark is set at the back and the corresponding "mirrortex_#" variable created in the script is selected

Done!