

Realistic Camera Model

翁振虔

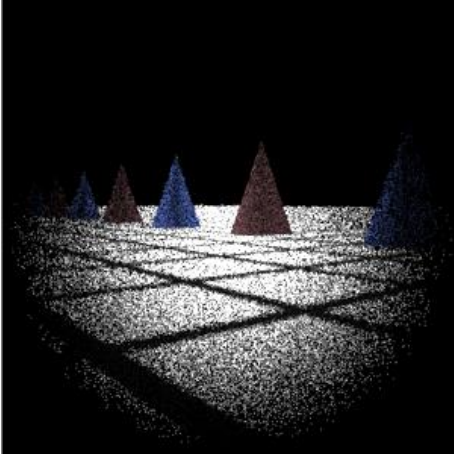
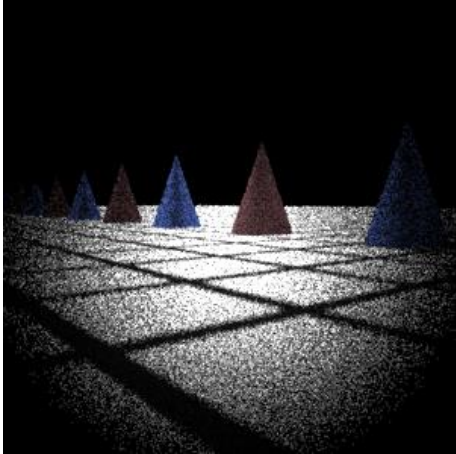
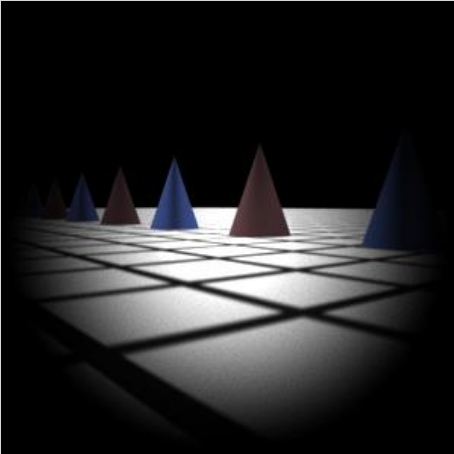
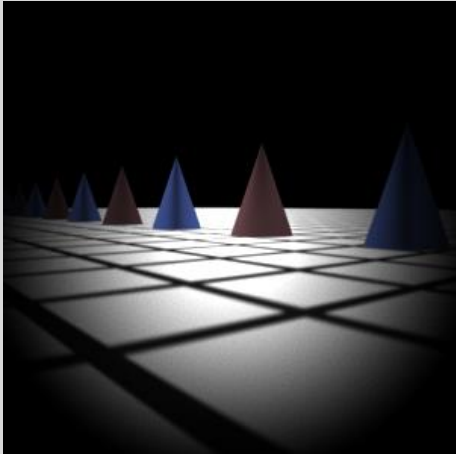
Implementation

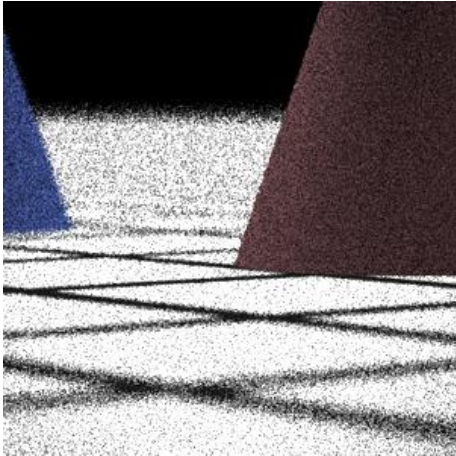
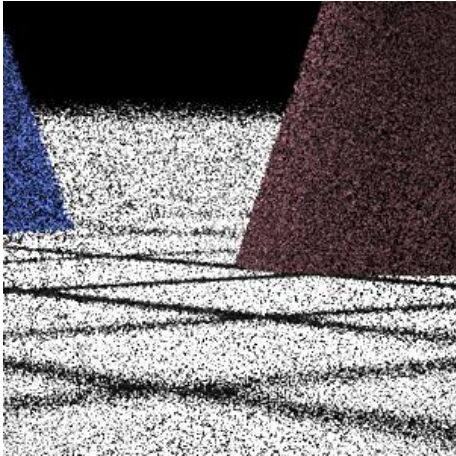
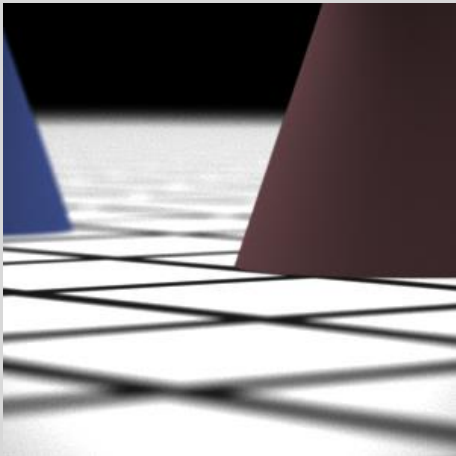
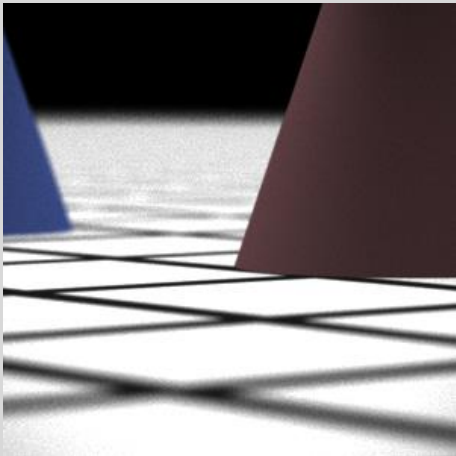
Instead of using exit pupil approximation, we perform a full simulation in the camera model. We use Sphere class with proper clipping parameters supported in PBRT to model the surface of the lens. The advantage is that we can directly employ the intersection function in the Sphere class, which saves our efforts and makes the code more compact. However, the intersection function computes all of the differential geometry parameters. We only need to know the position of the intersection point. Therefore, we rewrite a LensBall class, which is similar to Sphere class, with simplified intersection function.

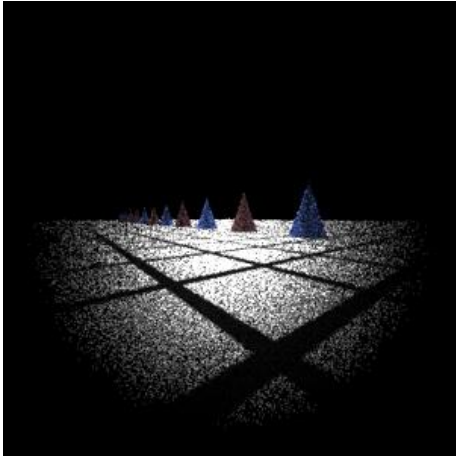

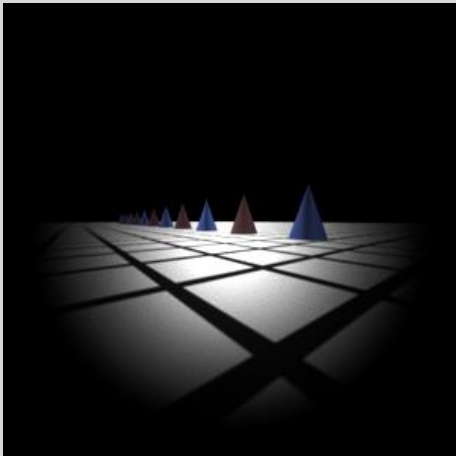
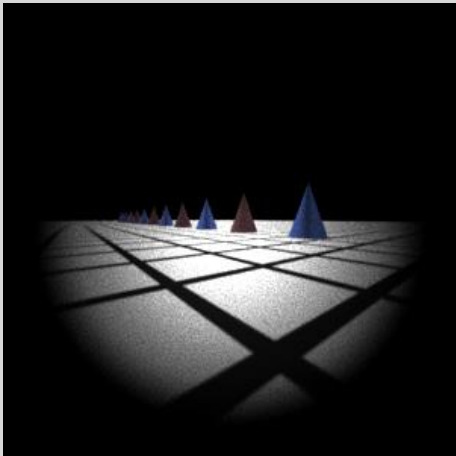
We have tried eq. (7),(8), and (9) in the reference paper to be the weighting factor. Eq. (7) was adopt in our implementation because of its better results.



Result

The experimantal results are shown below. It should be noted that our implem entation has less noise than the reference, which may be caused by the differen t sampling method.

Dgauss 50mm		
	Implementation	Reference
4		
512		

Telephoto 250mm		
	Implementation	Reference
4		
512		

Wide 22mm		
	Implementation	Reference
4		
512		

Fisheye 10mm		
	Implementation	Reference
4		
512	