

Lecture 1 Report Requirement:

Read the slides of Lecture 1 and answer the following questions in your report. Send your report in PDF format to chenzhang@shanghaitech.edu.cn, named as "report1_[first name][last name].pdf" (e.g., report1_ZhangChen.pdf). The report is due on 10 am, China Standard Time, March 24, 2020.

Report Questions:

1. Given a thin lens of focal length f , assume the distance between the lens and [image plane](#) s_i , what's the size of the defocus blur of a 3D point lying at distance s_d from the lens?
2. Given a thin lens of focal length f , assume the optical axis aligns with the z axis, the lens aligns with the x - y plane, the center of the lens aligns with the origin. What's the position (in 3D) of the image of a 3D point $[p_x, p_y, p_z]$?
3. What is the vertigo effect? How can you synthesize the vertigo effect using a real camera?
4. Give several ways to extend the depth of field? You can be creative and not restricted to the ones discussed in the ppts.
5. What are coma, spherical aberrations, astigmatism? Can you propose ways to reduce such artifacts?
6. Explain how to see through an occluder using refocusing.
7. How will you "synthesize" defocus blurs from a RGBD image (RGB + depth map)?