Lecture 7 Report Requirement

The report only needs to answer the questions below.

Send your report in PDF format to 1430090453@qq.com, named as "report7_[first name][last name].pdf" (e.g., report7_ZhangChen.pdf). Please also include your name (both English and Chinese) in the report. The report is due on 10 am, China Standard Time, April 15, 2020.

Report Questions:

"The Diffractive Achromat Full Spectrum Computational Imaging with Diffractive Optics"

1. Briefly explain the causes of chromatic aberration in conventional diffractive lens system.
2. For Eq.(5) in the paper, why do we move the k_c term out of the integral (make it constant)?
3. Why do we choose l_1 norm instead of least squared error term when optimizing the spectral PSFs?
4. Before formal optimization, how can we calculate an initial guess for the starting height profile? Why do we need a proper initialization?
5. What is the purpose of the downsample operation during image reconstruction?

"Learned large field-of-view imaging with thin-plate optics"

6. What issues may occur when using multiple optical components?
7. What are the disadvantages of existing thin plate computational imaging methods?
8. Explain why the phase map has a drastic variation when approaching larger incident angles.
9. How do we obtain visually pleasing results that generalize to real data during learned reconstruction?
10. What are the limitations of the proposed reconstruction method compared with conventional digital cameras?