Lecture 11 Report Requirement

Report Questions:

"First-Photon Imaging"
1. What is SPAD device? And list one or more applications of SPAD based imaging system.
2. Describe the three steps of the first-photon imaging system.
3. What is Poisson Noise and give the formulation of Poisson noise?
4. Scene with higher reflectivity results in larger or smaller $n(x, y)$ values? and why?
5. List at least two issues of the first-photon imaging system.

"Signal Processing Based Pile-up Compensation for Gated Single-Photon Avalanche Diodes"
6. What is Pile-up phenomenon and describe the reason for this issue?
7. What's the difference between the SPAD and Gated SPAD?
8. How to derive the Cramer-Rao bound?
9. Why does the author use the conjugate prior for the multinomial distribution?
10. List at least one issue of this work?