

Exercises to inf5442_h14_2

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1. Define cut-off wavelength, and what is the value for silicon?
2. 50% of red, green, and blue light in silicon is absorbed at which depth?
3. Is it possible to only read out a small portion say 10x10pixels window (region-of-interest) of a larger CCD sensor? How is this different from a CMOS sensor?
4. Why are CCD sensors limited to analog output, only? Why not integrate A/D converters and digital signal processing circuits?
5. Explain the difference between global shutter and rolling shutter readout.
6. What are the pros and cons of CCDs versus CMOS image sensors?
7. What is smear and why is it only applicable to CCD sensors?
8. Explain the artifacts that can occur when rolling shutter sensors capture fast moving objects
9. Why do most CMOS image sensors use rolling shutter instead of global shutter?
10. Let a 10x10um ideal photon detector be illuminated by 10k photons. What is its signal/noise ratio?