

Chapter 2

The image, its representations and properties

Short-answer questions

- S2.1 The diagram should make clear that perspective projection implies a cone emanating from the focal point of the camera, while orthographic implies parallel projection lines.
- S2.2 These definitions may be taken directly from the text.
- S2.3 As a cheap way of achieving the illusion of continuous motion through rapid frame change., without having to recast the whole frame.
- S2.4 This is a practical exercise, demonstrated by experiment.
- S2.5 These definitions may be taken directly from the text.
- S2.6
- R_i is the spectral sensitivity of the sensor, I is the spectral density of the illumination and S describes how the surface patch reflects each wavelength.
 - q_i is the spectral response of the i^{th} sensor.
- S2.7 This is illustrated in Figures 2.29 and 2.31.
- S2.8 Constancy refers to the ability to interpret the same color regardless of illumination and shadow effects. This is important but difficult in interpreting the wide range of, e.g., RGB triples that might represent a single real-world color.

Problems

Solutions to many relevant tasks, and Matlab implementations of selected algorithms that can help solve problems associated with this chapter, are provided in the Matlab Companion to this text:

Solutions Manual for Image Processing Analysis and Machine Vision 4th Edition by Sonka

Full Download: <http://downloadlink.org/Chapter-2-The-image-manipulations-and-properties>

- Svoboda T., Kybic J., and Hlavac V. Image Processing, Analysis, and Machine Vision: A MATLAB Companion. Thomson Engineering, 2008.

The Matlab Companion homepage <http://visionbook.felk.cvut.cz> offers images used in the problems. The Matlab code is well commented and is provided for educational purposes.