CS148: Reading Guide, Thursday 26 June

Shirley Ch. 22: Visual Perception

This reading covers basic concepts in perceptual effectiveness - that is, images that accurately convey the information they are intended to. Don't worry about memorizing the technical terms introduced here, but do carefully consider the examples given in the chapter, and think about their implications in computer graphics.

1) Although it is available online, some students may prefer to read the textbook in paper format. Relate what you learned in 22.2.1 to this preference. (Hint: at a normal viewing distance, text printed at 300 dpi has contrast of approximately 30 cycles/degree.)

Since the best LCD monitors only have a contrast of 20 cycles/degree the contrast of printed text will have higher contrast. This higher contrast probably puts less stress on the eye when reading over longer periods.

2) Name a stimulus the visual system is very sensitive to:

Edges consisting of lines of discontinuity in brightness.

3) Name a stimulus the visual system is not very sensitive to:

Slowly varying intensity patterns.

4) You see something yellow. What are two possibilities for the wavelengths of light exciting the cone cells in your retina?

A single wavelength of 580 nm or a combination of light at wavelengths of 700 nm and 540 nm, with appropriately chosen relative strengths.

5) Check out how cool figure 22.18 is (p. 574). We'll talk much more about depth of field (DOF) next week. Was the illusion easy for you to see?

Yes it was. In the first picture the square appears to be on top of the background. In the other, it looks as like there is a square cut in the foreground showing the pattern underneath.

6) What are some ways we determine surface orientation? (See figures 22.26-7).

Assuming that the elements of a repetitive texture are the same size over a surface the orientation can be determined by the changes of element size and separation as a function of distance from the viewer.

Fun fact: the incompatibility between North American NTSC (60Hz) and the more common PAL (50Hz) refresh rates is a direct result of the use of the metric system, which requires cycling AC at multiple of 5 or 10. (p. 571)