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MUEN D156, 09:15–10:50 M–F

Homework 2: Contrast Sensitivity
20 Points: Due at the beginning of class, Wednesday, 21 June 2006

There are two parts to this homework assignment. Each part counts 10 points. Late homework will receive a grade of zero.

Part 1:

In the table below are given the contrasts for detecting (at $d_a = 1.0$) sine wave gratings of various spatial frequencies. Assume that stimuli having amplitude less than these values would not be visible.

cpd	contrast
1.0	0.00409
1.25	0.00377
1.90	0.00274
2.65	0.00229
3.75	0.00175
5.50	0.00157
7.50	0.00164
8.00	0.00198

cpd	contrast
9.00	0.00208
10.65	0.00278
15.00	0.00489
18.50	0.00845
21.25	0.0150
26.50	0.0377
30.00	0.0702
40.00	0.362

a. Will a 3.0 cpd sine wave grating with contrast of 0.005 be visible? Why?

b. Will a 30.0 cpd sine wave grating with contrast of 0.005 be visible? Why?

Part 2:

Use the contrast threshold data in the table and plot two graphs of the contrast sensitivity function (CSF) with contrast sensitivity (S = 1/(contrast)) on the vertical axis and spatial frequency on the horizontal axis. Make both the x- and the y-axes have logarithmic coordinates. Compare this graph with CSFs in the textbook. Are they the same or are there differences?