T-61.271 Information visualization

Exercise 2. Thu 16.10.2003:12-14 T4

- Basic visual percption
- Color perception and visualization

1. Aliasing and antialiasing. Show an example of aliasing effect and how it can be detrimental to visualizations. How can this be corrected with antialiasing? List and discuss the properties of a perfect 2D computer display (flat display that could not be made to look any better by adding more resolution or refresh frequency or color resolution etc.). Hint: Ware p. 66 onwards, and chapter 4.q

2. Create an image that shows a strong color contrast effect.
(The same color looks different when it is surrounded by different colors).

3. Plot the gamut of a color foto/image in CIELab space. You can convert RGB values to XYZ with the following equation.

$$\begin{bmatrix} X \\ Y \\ Z \end{bmatrix} = \begin{bmatrix} 0.431 & 0.342 & 0.178 \\ 0.222 & 0.707 & 0.071 \\ 0.020 & 0.130 & 0.939 \end{bmatrix} \begin{bmatrix} R \\ G \\ B \end{bmatrix} \tag{1}$$

The white point to be used in the CIELab formulas is D65:

$x_n = 0.312713$, $y_n = 0.329016$ and $Y_n = 1.0$.