How does Histogram equalization work?

by Nasser Abbasi, Oct 23, 2004

We are given an image, that we need to perform histogram matching on.
So we are given an images with pixels at some gray level, we want to generate a new image with pixels at some new gray levels such that the new image will have a Probability distibution function which is uniform.

First find its histogram H.

Next find P, the probability density function, which is $\frac{H}{n}$ where n is the number of pixels.

Next find the CDF, which is the cummulative probability distribution function. This is found from P ofcourse by summing the probbailities.

That is all. Now to find the new gray levels, simply scan the inout image, for each pixel, look at its gray level, find the CDF corresponding to that that gray level from by looking up the CDF table. The value of the CDF is the new gray level.

The result of doing this will give a new image with uniform probabiliy distribution.

from the net:
"Typical use of histogram matching is to make two images with a small, but noticeable, difference in intensity look the same way before mosaicking the images."