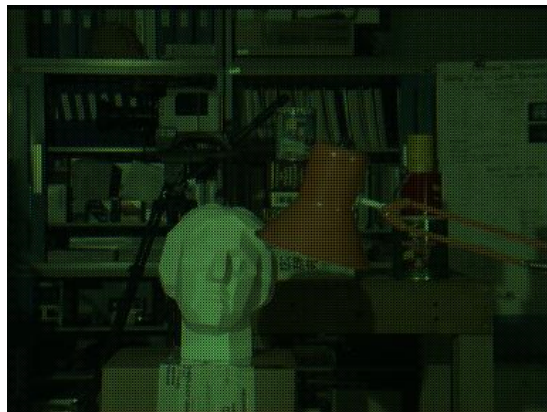


Homework #1

Due: 3/31/2011 (11:59am)

1. (40pts) Write a nearest-neighbor-based image demosaicing program that interpolates the missing color values for all pixels in the image from the Bayer-pattern sampled color values, shown in the following two images. Show the demosaiced image and the associated PSNR values for each of the three color channels separately by comparing the demosaiced image with the ground-truth image.



2. (60pts) For the following grayscale image of size 256x256, partition the image into non-overlapping blocks of size 8x8 and compute the 2D DCT for all the 8x8 blocks. For each set of 8x8 DCT coefficients, retain (a) the 2x2 lowest-frequency coefficients, (b) the 4x4 lowest-frequency coefficients, and (c) all the 8x8 coefficients, and set the remaining coefficients to zero. Then, compute the inverse DCT for each block to reconstruct the compressed image. Show the reconstructed images and compute the PSNR values for the three different settings.



Original Image



Reconstructed Image