ECE 6364 Spring 2016 HW 2 Due 2/2

Problem 1. Fundamentals of Digital Image Processing - Jain: Problem 2.1 a,b

Problem 2. If the 2-D continuous Fourier transform of an arbitrary image $f(x,y)$ is $H(\omega_1,\omega_2)$ where (x,y) are in units of cm and (ω_1,ω_2) are in units of radians/cm, derive the Fourier transform $G(u,v)$ of that same image $f(x,y)$ where (u,v) are in units of cycles/cm as a function of $H(\cdot,\cdot)$

Problem 3.
(a) Draw a 2-D graph of $tri(x,y) = tri(x)tri(y)$ and find its 2-D continuous Fourier transforms in Hz by evaluating the FT integral.

(b) Draw a 2-D graph of $f(x,y) = 3\,rect(\frac{x}{2},2y)$ and find its 2-D continuous Fourier transforms in Hz using the tables of FTs and properties.

Problem 4. Fundamentals of Digital Image Processing - Jain: Problem 2.5 a