

Math 155. Instructor: Wen Li.

Teaching Assistant: Siting Liu.

Homework # 6, due on Friday, February 21

[1] (a) Implement the Gaussian lowpass filter in Eq. (4.8-7), using a radius $D_0 = 25$, and apply the algorithm to Fig4.45(a).

(b) Highpass the input image used in (a), using a highpass Gaussian filter of radius $D_0 = 25$ (see eq. (4.9-4)).

(Please print out code and figures.)

[2] Consider the two-dimensional continuous case.

(a) Write the inverse Fourier transform formula by expressing $f(t, z)$ as a function of $F(\mu, \nu)$.

(b) Assume f is twice differentiable. Using (a), find the Fourier transform of the mixed partial derivative $\frac{\partial^2 f}{\partial t \partial z}$. (Express Fourier transform of the mixed partial derivative as a function of μ , ν and F).