

# BME 51:185 — Homework 1

DUE: September 10, 2004 at start of class

1. GW 2.19
2. GW 3.10
3. GW 3.17
4. Given the convolutional mask operator

$$\frac{1}{16} \cdot \begin{bmatrix} 1 & 2 & 1 \\ 2 & 4 & 2 \\ 1 & 2 & 1 \end{bmatrix}$$

- (a) Find the 2D DTFT of this operator.
- (b) Let  $\Omega_2 = 0$  in the DTFT. Using MATLAB, plot the 1D frequency response  $H(\Omega_1, 0)$  for this system.
- (c) Compare the results in part (b) to the frequency response for the  $3 \times 3$  neighborhood averaging mask discussed in class. How do the frequency responses differ?