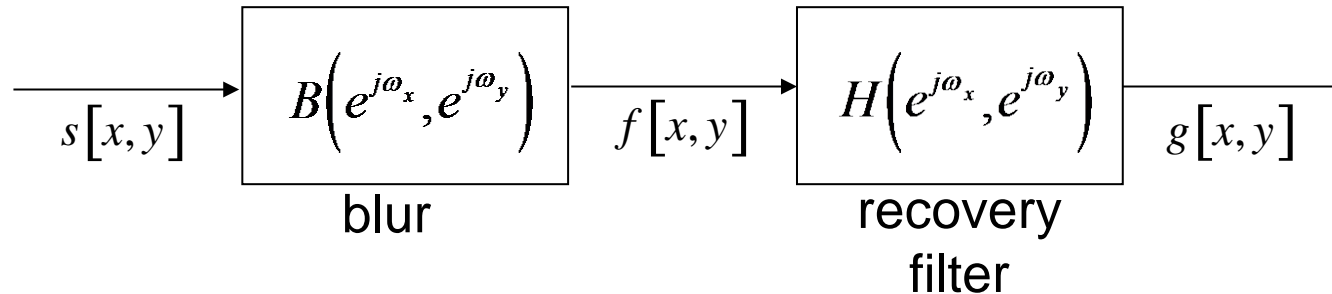


# Image deconvolution

- Given an image  $f[x,y]$  that is a blurred version of original image  $s[x,y]$ , recover the original image.
- Assume linear shift-invariant blur, transfer function  $B(e^{j\omega_x}, e^{j\omega_y})$



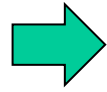
- Naive solution: inverse filter

$$H(e^{j\omega_x}, e^{j\omega_y}) = \frac{1}{B(e^{j\omega_x}, e^{j\omega_y})}$$

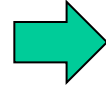
- Problem:  $B(e^{j\omega_x}, e^{j\omega_y})$  might be zero, noise amplification

# Naïve deconvolution

Original



Blurred w/  $B(e^{j\omega_x}, e^{j\omega_y})$



Deblurred w/  $B^{-1}(e^{j\omega_x}, e^{j\omega_y})$



+ white noise   $rms = 2.5$

