

# **ECE 468: Digital Image Processing**

## **Lecture 9**

**Prof. Sinisa Todorovic**

**[sinisa@eecs.oregonstate.edu](mailto:sinisa@eecs.oregonstate.edu)**

# Outline

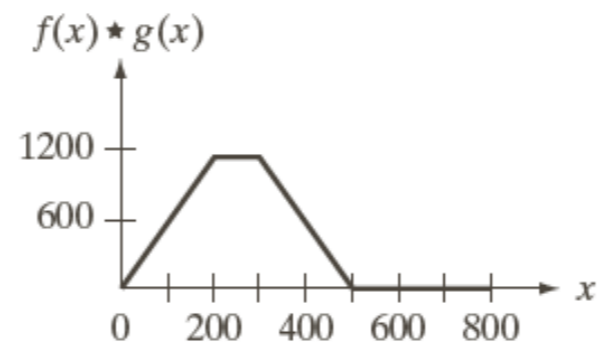
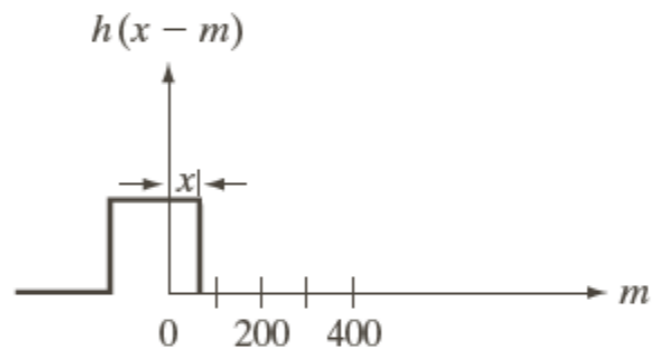
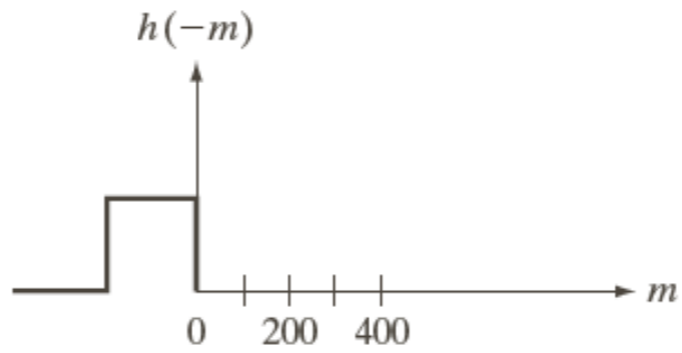
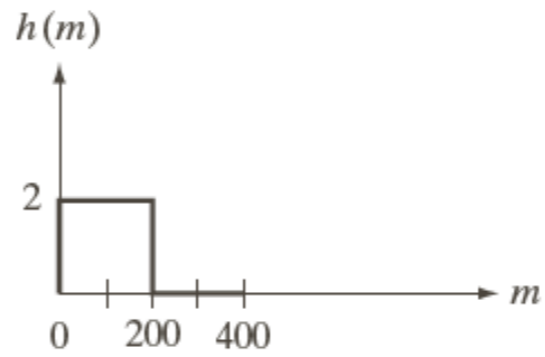
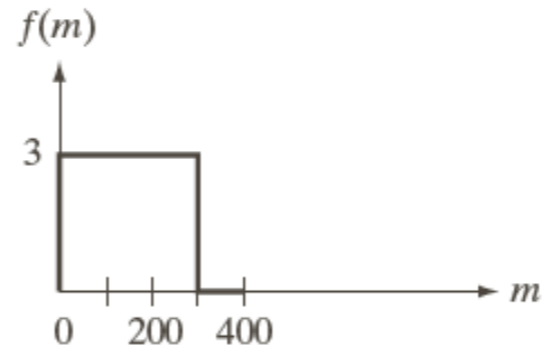
- 2D Continuous Fourier Transform (Textbook: 4.5, 4.6)

# Disclaimer

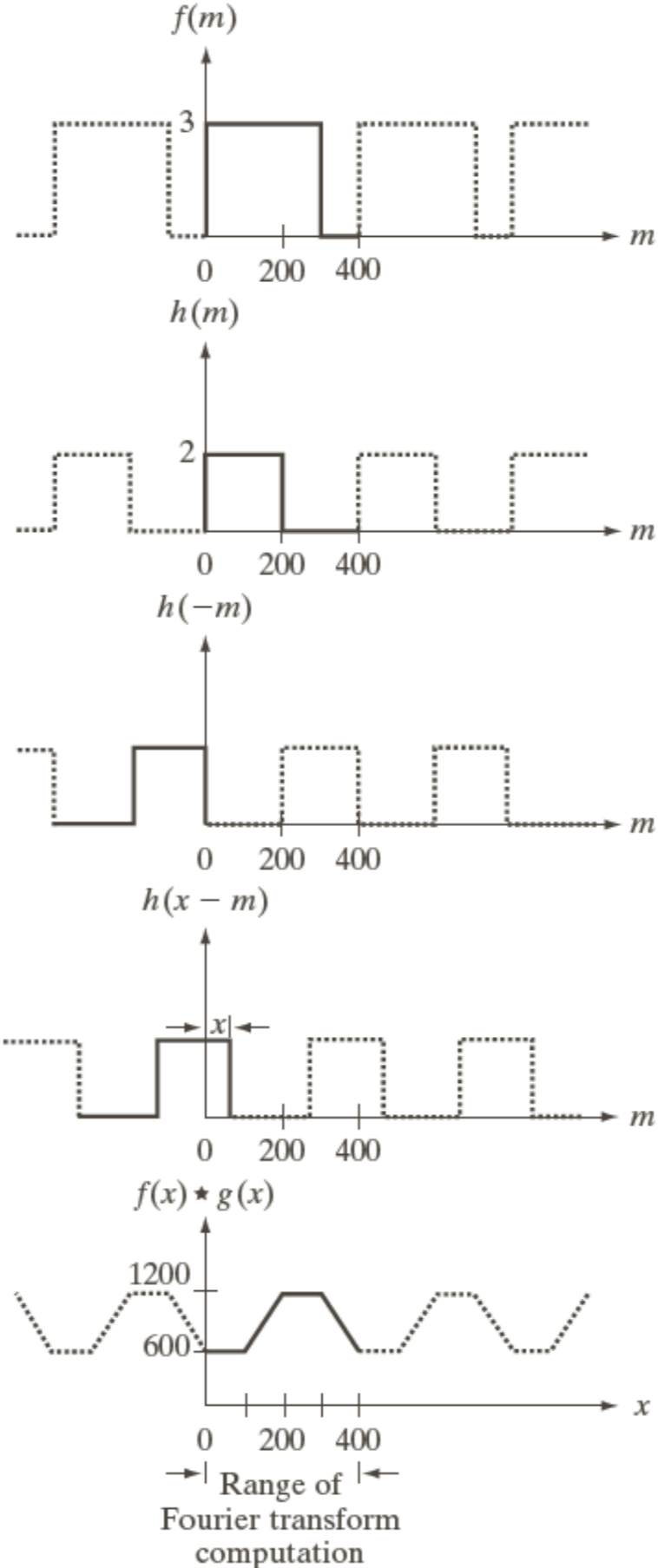
The following slides are just excerpts  
from the textbook.

You should learn all material presented  
in chapter 4 in the textbook!

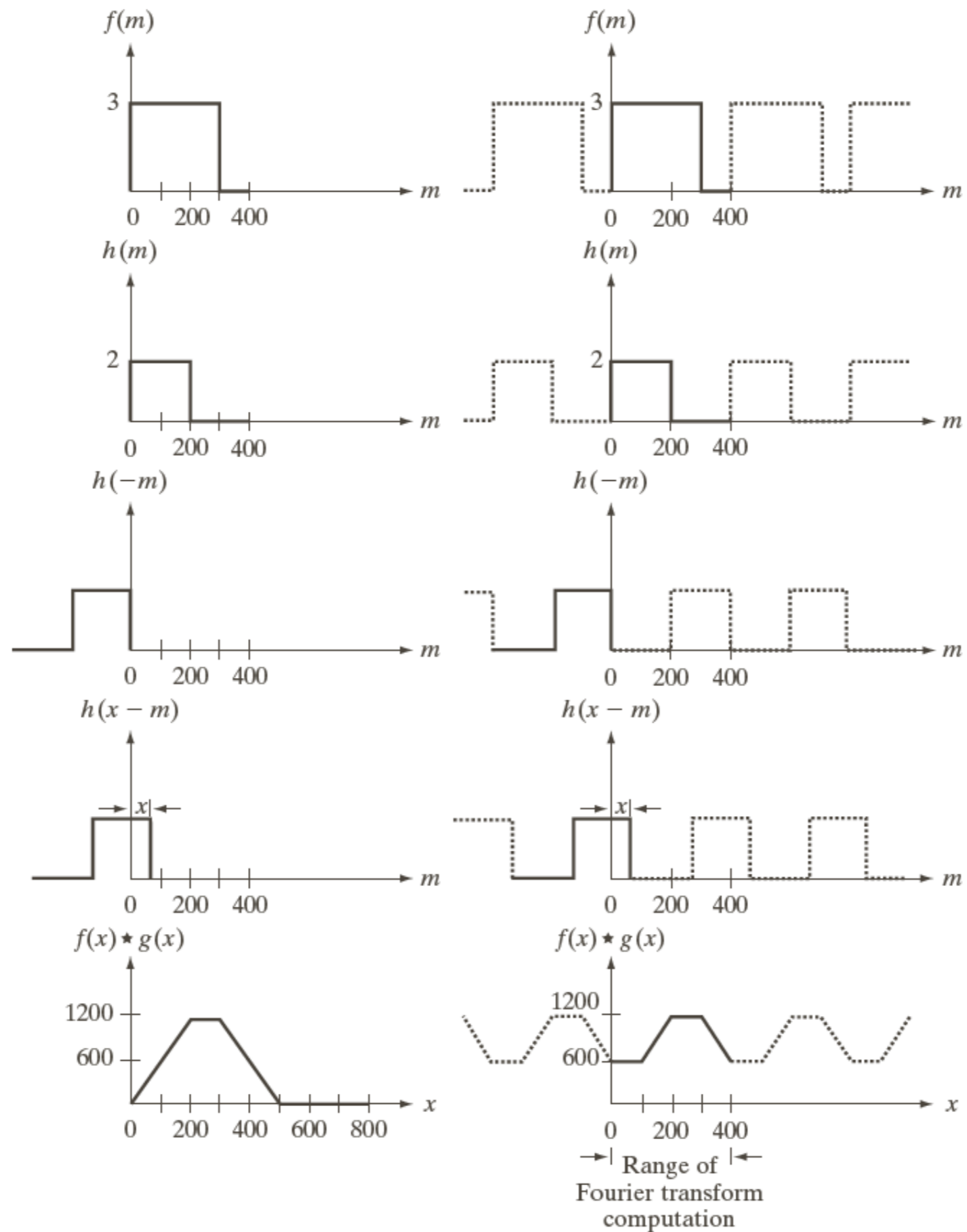
# Convolution



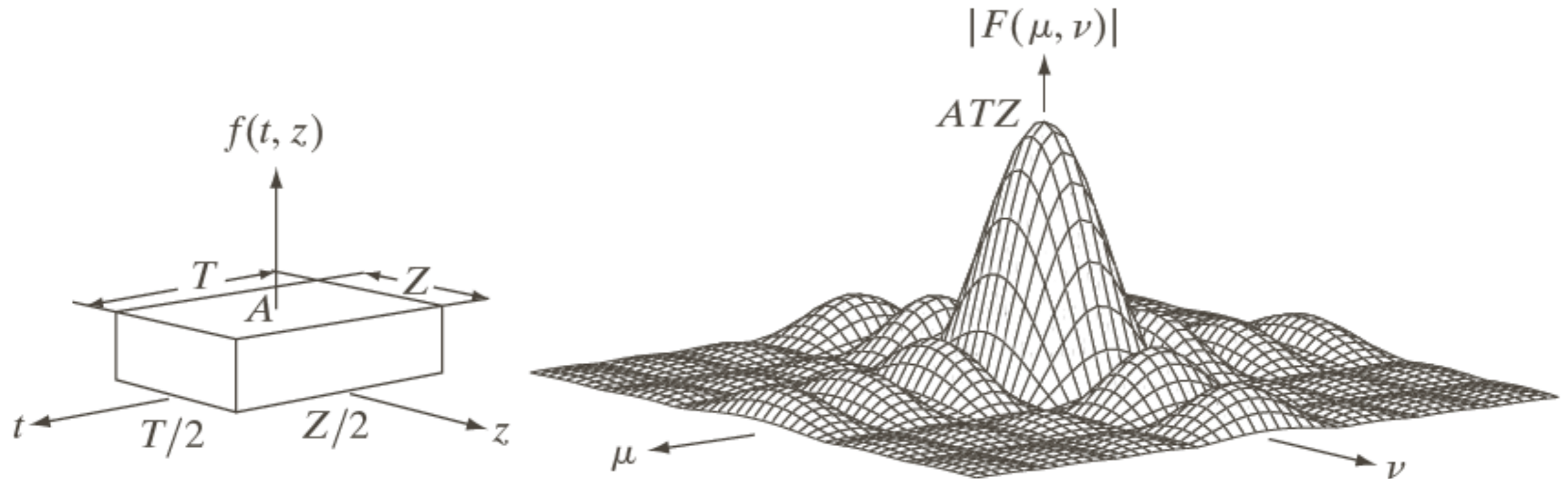
# Circular Convolution



# Convolution vs. Circular Convolution



# CFT of Rectangular Pulse



a b

**FIGURE 4.13** (a) A 2-D function, and (b) a section of its spectrum (not to scale). The block is longer along the  $t$ -axis, so the spectrum is more “contracted” along the  $\mu$ -axis. Compare with Fig. 4.4.

$$F(\mu, \nu) = ATZ \frac{\sin(\pi\mu T)}{\pi\mu T} \frac{\sin(\pi\nu T)}{\pi\nu T}$$

# Train of Impulses in 2D

