

DSP in VLSI Design

Homework (I)

Introduction to Digital Signal Processing Systems

Deadline: Sept. 22

1. Please prove that the circuits in Slide 53 and Slide 54 are equivalent.
2. Consider a 2D moving average filter for an image, which can be shown as the following equation:

$$y(i, j) = \sum_{m=-1}^1 \sum_{n=-1}^1 x(i+m, j+n),$$

$$i, i+m \in [0, W]$$

$$j, j+n \in [0, H],$$

where $x(i,j)$ is the input image, $y(i,j)$ is the filtered image, and W and H are the width and height of the image, respectively. Please draw the dependence graph.

Please deliver the homework in PDF format on NTU COOL