

ECE 6364 Spring 2016 HW 1 Due 1/26

Problem 1 Answer the following

- a) Where $\underline{\mathbf{X}} = \begin{bmatrix} 2 & 3 & 1 \\ 4 & 8 & 5 \\ 7 & 9 & 6 \end{bmatrix}$ and $\underline{\mathbf{X}}(0,0) = 2$ is the bracketed entry, using matrix-indexing $\underline{\mathbf{X}}(1,2) = ?$; using image-indexing $\underline{\mathbf{X}}(1,2) = ?$
- b) form row-ordered vector $\bar{\mathbf{x}}$ from $\underline{\mathbf{X}}$
- c) form column-ordered vector $\bar{\mathbf{x}}$ from $\underline{\mathbf{X}}$

Problem 2. Read section 2.2 of the handout Jain - Digital Image Processing

Draw a 2-D plot of $f(x, y) = u(x, y - 1) - u(x - 2, y)$ where $u(\cdot, \cdot)$ is the 2-D step-function

$$u(x, y) = \begin{cases} 1 & (x, y) \geq 0 \\ 0 & \text{else} \end{cases}$$

Problem 3. Form a "functional" representation of $f(x, y)$ using at least one 2-D step function $u(\cdot, \cdot)$ (probably you will need to use more than one $u(\cdot, \cdot)$)

$$f(x, y) = \begin{cases} 1 & 1 \leq (x, y) \leq 4 \\ 0 & \text{else} \end{cases}$$