EE 146 COMPUTER VISION

Department of Electrical & Computer Engineering
University of California at Riverside
Tues., Thurs. 3:30 - 4:50pm, Online Class, WCH 142, Winter Quarter 2022
Labs Wed 8:00 --10:50am, Online; Thurs. 11:00 -- 1:50pm, Online

EE 146 Lab 9, March 2 & 3, 2022

Goal: Understand co-occurrence matrices as a characteristic of texture in images.

Problem 1: Co-occurrence matrices and features

A co-occurrence matrix is a two-dimensional array C in which both the rows and the columns represent a set of possible image values V. Co-occurrence matrix **C(i, j)** indicates how many times gray scale value **i** co-occurs with gray scale value **j** in some designated spatial relationship d. d is a displacement vector **(dr, dc)** where **dr** is a displacement in rows and **dc** is a displacement in columns.

Co-occurrence matrix **C(i, j) is defined by**

C(i, j) = |{[r, c]| I(r, c)=i and I(r + dr, c + dc)=j}|

In this lab, first, you will calculate co-occurrence matrices from images and then you will compute several features, such as energy, entropy, contrast, homogeneity and correlation from the normalized co-occurrence matrix.

Steps:
1) Download images from ilearn.
2) For each image
    a) Compute co-occurrence matrix C(1, 2), C(2,2), C(2, 3).
    b) Normalize the co-occurrence matrix.
    c) Compute energy, entropy, contrast and correlation.

3) Display co-occurrence matrices as gray scale images and submit them.
4) Submit the calculated features.