# ECE 285, Spring 2020
Image and Video Compression
DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING
UNIVERSITY OF CALIFORNIA, SAN DIEGO

LAB 2: Transform decorrelation efficiency

This lab requires to compare the decorrelation efficiency of 2D transforms: DCT, DST, and KLT like an example figure below. The size of the correlation matrix, $R_{xx}(\rho)$ is 8x8 and apply each transform to the correlation matrices to obtain the transform coefficients, $Y = Transform(R_{xx}(\rho))$ where ρ=[0.98, 0.9, 0.8, 0.7, 0.5, 0.3, 0.1]. The decorrelation efficiency is defined as $\eta_c = 1 - \dfrac{\sum \sum_{i \neq j} |y_{ij}|}{\sum \sum_{i \neq j} |r_{ij}|}$.

Use the type-II DCT and the type-I DST. You should derive the basis functions of KLT from the correlation matrix of the estimated correlation coefficients ρ from image1 ('Foreman_cif.mat') and image2 ('random_img.mat'), respectively. Use 500 random samples of image1 and image2 to estimate the correlation coefficients. The result of the image below is only for an example. You shouldn't expect the same result.
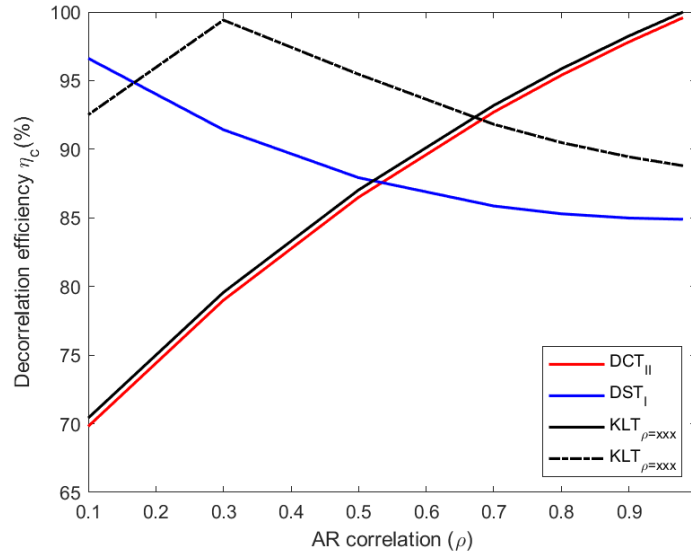
Programming language: Matlab or Python