Mini Project
EC3093D Digital Signal Processing Lab
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EC04

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Abstract:

IMAGE and AUDIO COMPRESSION USING
PRINCIPAL COMPONENT ANALYSIS

Principal component analysis (PCA) is a technique for reducing the dimensionality of such datasets, increasing interpretability but at the same time minimizing information loss. It is done by creating new uncorrelated variables that successively maximize variance. This technique finds an application in compressing images and audios by the way of decreasing the size of the data required to construct the image.

We aim to achieve this by transforming the original image and audio data into a new set of variables, known as principal components, which are ordered according to their amount of variance. By selecting only the principal components that contain the most variance, we can effectively remove noise and other unwanted features from the image and audio data, while retaining the essential characteristics.

In addition, PCA can be combined with other processing techniques, such as Wavelet transforms and Fourier transforms, to further improve the performance of the system. PCA provides a powerful tool for image and audio processing, allowing for efficient and effective data reduction, while preserving the most important features of the original.

Software of Implementation: MATLAB