

Image segmentation based on spectral clustering methods

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Image segmentation is a process of partitioning a digital image into smaller parts or small region to highlight the much important parts of an image. Segmented parts of an image should possess similar properties such as intensity, texture, color *etc.* Spectral clustering methods are based on eigenvectors of Laplacian matrices associated with the graphs. In this study, we considered a digital image as a graph and used various existing clustering methods to find the segmentations. Second smallest eigenvector of generalized eigensystem, the recursive two way normalized cut method, simultaneous k-way cut with multiple eigenvectors and k-means algorithms are used to partition the images. We compare the clusters obtained from these methods and identify the most efficient method in order to classify the images we considered. Calinski – Harabasz measure and gap evaluation criterion are used to evaluate the quality of clusters. Simulations are carried out using Matlab.

Keywords: Clustering, Eigenvectors, Image segmentation, K- means, Normalized cut