**A NEW APPROACH FOR IMAGE SEGMENTATION USING  
PILLAR-KMEANS ALGORITHM**

**ABSTRACT**

This paper presents a new approach for image segmentation by applying Pillar-Kmeans algorithm. This segmentation process includes a new mechanism for clustering the elements of high-resolution images in order to improve precision and reduce computation time. The system applies K-means clustering to the image segmentation after optimized by Pillar Algorithm. The Pillar algorithm considers the pillars’ placement which should be located as far as possible from each other to withstand against the pressure distribution of a roof, as identical to the number of centroids amongst the data distribution. This algorithm is able to optimize the K-means clustering for image segmentation in aspects of precision and computation time. It designates the initial centroids’ positions by calculating the accumulated distance metric between each data point and all previous centroids, and then selects data points which have the maximum distance as new initial centroids. This algorithm distributes all initial centroids according to the maximum accumulated distance metric. This paper evaluates the proposed approach for image segmentation by comparing with K-means and Gaussian Mixture Model algorithm and involving RGB, HSV, HSL and CIELAB color spaces. The experimental results clarify the effectiveness of our approach to improve the segmentation quality in aspects of precision and computational time.

Keywords—Image segmentation, K-means clustering, Pillar algorithm, color spaces.