

# Multispectral Imagery Classification Using Unsupervised Approach

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**ABSTRACT:** Multispectral Imagery Classification can be implemented by either supervised or unsupervised method. The former mentioned approach requires a *prior* knowledge about the data such as the number of classes, training samples or data background, while the later one does not require any knowledge about the data or needs only little information. In general, a supervised approach yields higher performance than the unsupervised one since it has more information. However, some information, such as training samples, is limited. In addition, when the data is large, sample selection is time consuming and must be done carefully to obtain high quality samples. Therefore, an unsupervised approach is an alternative choice if the processing time is considered.

The objectives of this research are to classify the Chaopraya River in the area of Bangkok using K-mean clustering technique, an unsupervised approach, and to study the impact of initial centers to the convergent rate in the process of K-mean clustering technique. A multispectral image used in this research was taken by Quick Bird in January 10<sup>th</sup>, 2005 with a size of  $7459 \times 5289$  pixels. The reasons of selecting K-mean clustering technique are that the technique yields high performance and requires only the number of classes, and its computational process is not complex. There are three major steps in the process of the Chaopraya River classification. In the first step, the number of classes is estimated. In the second step, the number of classes obtained from step 1 is used for the number of centers/classes in K-mean clustering technique. In the final step, the Chaopraya River is classified. The results show that the accuracy of the classification is high, about 92%. The results also show that the initial centers affect to the convergent rate in the process of K-mean clustering technique. When the initial centers are initiated by extracted endmembers obtained from endmember extraction techniques, the convergent rate can be increased.

**KEY WORDS:** Classification, unsupervised classification, k-mean clustering