**Reduction in Dimensions of Hyperspectral Images**

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**Abstract:** As the use of hyperspectral imaging techniques increases for various applications like astronomy, agriculture, biomedical imaging and mineralogy it becomes extremely important to reduce the complexity of the data obtained. Complex data increases computation time by several manifolds and hence it is difficult to process this data. One way to reduce the complexity of this data is to reduce the dimensionality of the hyperspectral images. This paper focuses on two linear algorithms for the same, name Principal Component Analysis (PCA) and Information Gain (IG).

**Introduction:**  Satellites transacts huge volumes of data between different sources. So reduction of these stack is always a must. Hyperspectral data use a number of dimensions which can be reduced by mapping them into lower order of dimensions without actually losing any considerable amount. Principal Component Analysis (PCA) is perhaps the most popular dimension reduction technique for remotely sensed data. The growth in data volumes due to the large increase in the spectral bands and high computational demands of PCA has prompted the need to develop a fast and efficient algorithm for PCA. In this work, we present on an implementation of Information Gain with PCA dimension reduction of hyper spectral data

**Information gain :** The **information gain** for an attribute is **defined** in terms of entropy as follows: The mutual **information** is equal to the total entropy for an attribute if for each of the attribute values a unique classification can be made for the result attribute.