

A QUANTITATIVE ANALYSIS OF MIXED-TO-PURE PIXEL CONVERSION (MPCV)

Over the past years many algorithms have been developed for multispectral and hyperspectral image classification. Due to a lack of standardized data, these algorithms have not been rigorously compared within a unified framework. In this chapter, we present a comparative study of several popular classification algorithms through a standardized HYDICE data set with custom-designed detection and classification criteria. The algorithms to be considered for this study are those developed in Chapter 8, viz. the orthogonal subspace projection (OSP), unconstrained Gaussian maximum likelihood (GML) classifier, minimum distance, and Fisher's linear discriminant analysis (LDA). In order to compare mixed pixel classification (MPC) algorithms against pure pixel classification (PPC) algorithms, a mixed pixel is converted to a pure pixel via a mixed-to-pure pixel converter (MPCV). The standardized HYDICE data are then used to evaluate the performance of various PPC and MPC algorithms. Since the precise spatial locations of all the targets in the standardized HYDICE data are available, the candidate algorithms can be evaluated by tallying the number of targets detected and classified for quantitative analysis.