Anomaly detection algorithms for hyperspectral imagery

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Abstract :

Nowadays the use of hyperspectral imagery specifically automatic target detection algorithms for these images is a relatively exciting area of research.
An important challenge of hyperspectral target detection is to detect small targets without any prior knowledge, particularly when the interested targets are insignificant with low probabilities of occurrence. The specific characteristic of anomaly detection is that it does not require atmospheric correction and signature libraries. Recently, several useful applications of anomaly detection approaches have been developed in remote sensing.
With this in mind, in this paper some anomaly detectors such as RX-based anomaly detectors(MRX,NRX,CRX,RX-UTD), Combined Fisher Test (CFT) model, as well as adaptive anomaly detectors such Nested Spatial Window-Based approach(NSW), dual window-based eigen separation transform (DWEST) and Gauss Markov Random field model (GMRF)are compared. Finally the most efficient method is proposed for implementation in a planned software system.