

Abstract – Detection and recognition are two primary tasks of hyperspectral imaging, with the objective of detecting and identifying materials remotely. Frequently these are done separately, with anomaly detection or signature recognition being applied, but not both in conjunction. Here, we introduce a fully automatic hyperspectral-based target recognition system through the combination of automatic anomaly detection, anomaly segmentation, pixel cueing methods for background reduction filtering, signature matching, automatic atmospheric compensation, and vegetation index thresholding for automatic atmospheric compensation. Of interest herein are the handling of pixels and groupings of pixels detected as a statistical anomaly; various methods of processing anomaly groups are examined. Results are provided using HYDICE hyperspectral radiance images and collected ground reflectance data.

Key Words – ATD, ATR, Automatic Target Recognition, Automatic Target Detection, chipping, cluster identification, cueing, hyperspectral, remote sensing.