Index Based Extraction of Impervious Surfaces Using RGB and NIR Band Combinations in AVIRIS-NG Hyperspectral Imagery

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Abstract:
The remote sensing imageries are helpful in monitoring the urban environment, specifically the growth analysis of urban impervious surfaces as they can provide quick and accurate information about these surfaces over the large geographical areas. The recently developed high spatial and spectral resolution hyperspectral sensors are capable of extracting impervious surfaces with very high accuracy. Therefore, this study utilizes AVIRIS-NG hyperspectral data of Jodhpur, Rajasthan region of India for the analysis. Further, on the basis of existing literature, RGB and NIR bands are selected for generation of three Impervious Surface Index (ISI). The results of the analysis suggest that, Green-NIR combination provides best extraction result with an Overall Accuracy (OA) of 95.20 %, while result of Blue-NIR with OA 90.28 % appears to be better than Red-NIR, which is having OA as 85.29 %. These results have also been verified using histogram plot of various urban land cover classes.

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