Utilizing the Principal Component Analysis on Multispectral Aerial Imagery for Identification of Underlying Structures

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Abstract : Aerial imagery is a powerful tool when it comes to analyzing temporal changes in ecosystems and extracting valuable information from the observed scene. It allows us to identify and assess various elements such as objects, structures, textures, waterways, and shadows. To extract meaningful information, multispectral cameras capture data across different wavelength bands of the electromagnetic spectrum. In this study, the collected multispectral aerial images were subjected to principal component analysis (PCA) to identify independent and uncorrelated components or features that extend beyond the visible spectrum captured in standard RGB images. The results demonstrate that these principal components contain unique characteristics specific to certain wavebands, enabling effective object identification and image segmentation.