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Examination of PCA Utilisation for Multilabel Classifier of Multispectral Images

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This paper investigates the utility of Principal Component Analysis (PCA) for multi-label classification of multispectral images using ResNet50 and DINOv2, acknowledging the high dimensionality of such data and the associated processing challenges. Multi-label classification, where each image may belong to multiple classes, adds further complexity to feature extraction. Our pipeline includes an optional PCA step that reduces the data to three dimensions before feeding it into a three-layer classifier. The findings demonstrate that the effectiveness of PCA for multi-label multispectral image classification depends strongly on the chosen deep learning architecture and training strategy, opening avenues for future research into self-supervised pre-training and alternative dimensionality reduction approaches.

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