Feature Extraction of Multimodal Images Based on Tensor Decomposition and Mathematical Morphology

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Motivation

- Enhancing feature extraction from HSIs by incorporating spatial information as tensors.

Morphological Filtering of Hyperspectral Images (HSIs)

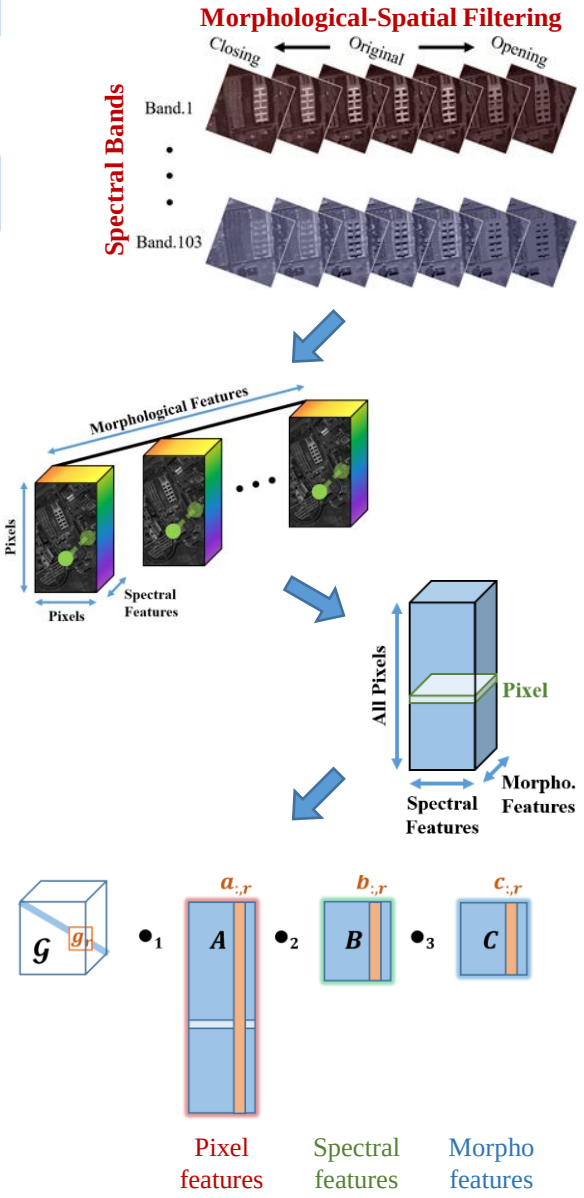
- Additional criterion to separate between the materials, extracted from the image itself.
- We want to extract the features without destroying the structure of the data.

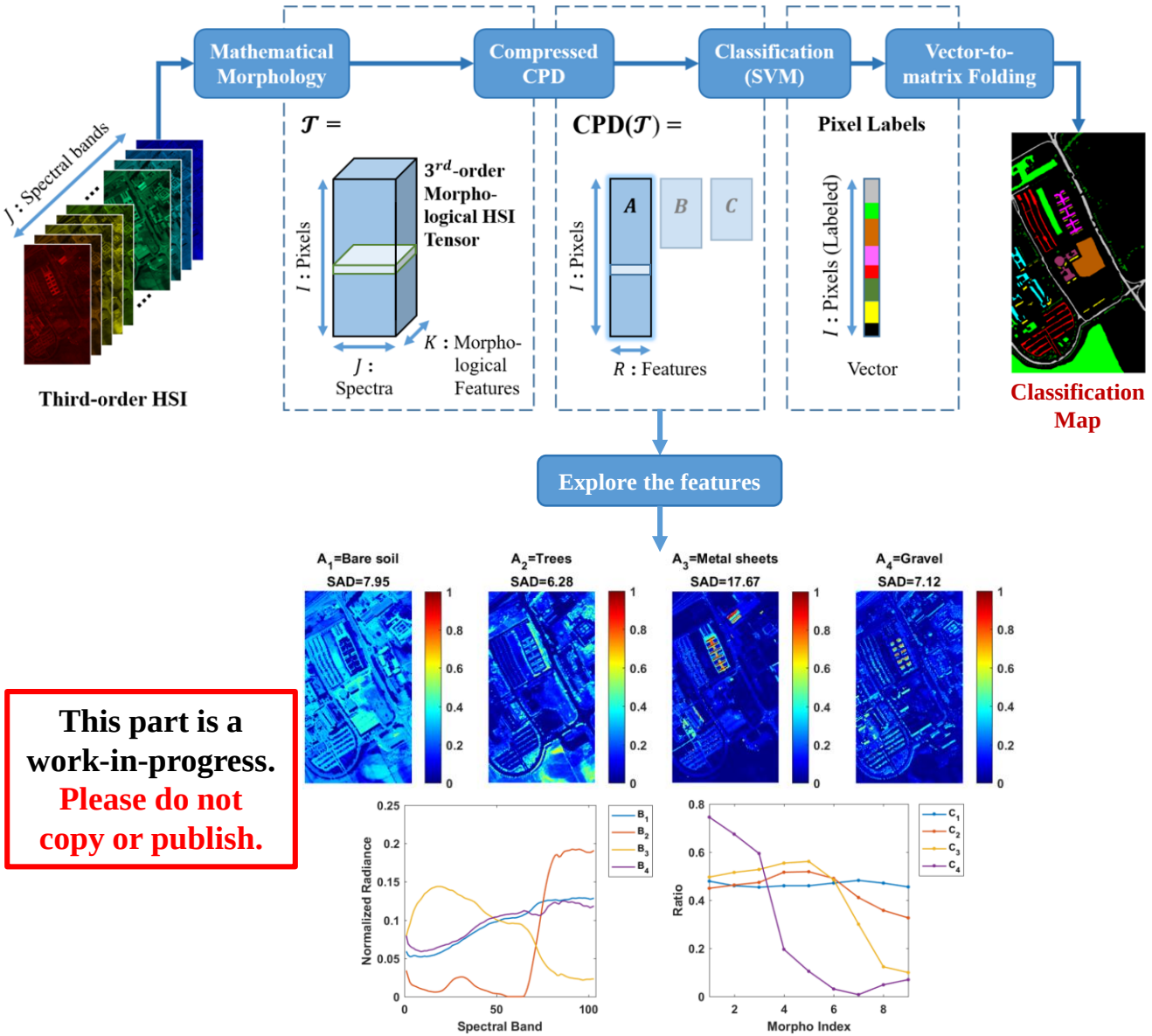
Tensor Representation

- Having two modes of pixels increases the rank of the data => Vectorize the image
- Even though vectorized, we do not need all the spatial information at once.
- Using Morphology with small neighborhoods accounts to enough spatial information where we can still have a low rank!

Feature Extraction Through CPD

- Using CPD, we can extract some features by looking at the columns of {A,B,C}.
- Experimental validation can be done on scene classification and blind source separation, where features are observed to be enhanced compared to the state-of-the-art.
- The obtained results can be further studied in algebraic or statistical terms.





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