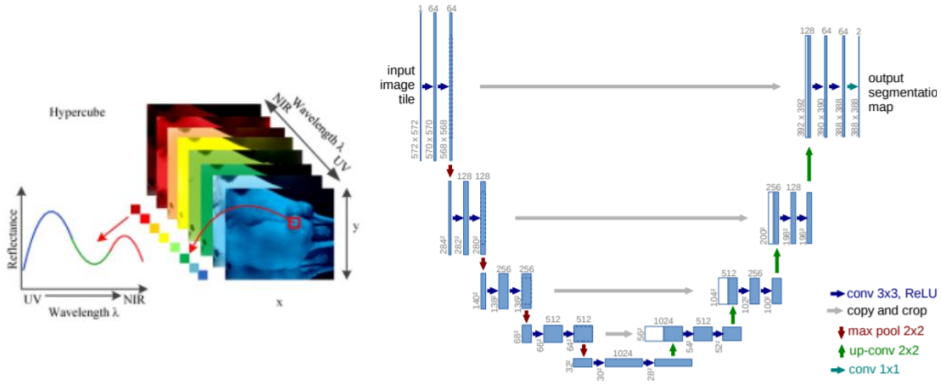
Bachelor/Master Thesis/Engineering Practice

Machine learning for hyperspectral microscopy images segmentation of 2D materials

Background

The combination of microscopy and spectroscopy, which is called microscale spectroscopic mapping, could offer microscale spatial information with high resolution and extra spectral information, and therefore provides more detailed characteristic information including quantitative information of the imaged area. Hyperspectral imaging microscopy is proven a promising technique for two-dimensional (2D) materials characterization before they can be further processed for devices fabrication in optics, photonics, and optoelectronics. Compared to widefield optical microscopy, hyperspectral imaging microscopy is advantageous in abundant spectral information acquisition.



Scope

In this work, deep learning technique is applied for hyperspectral image segmentation of monolayer, bilayer, and trilayer transition metal dichalcogenides (TMDs), providing important flake information including profiles, distribution, and layer numbers.

References

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(2) Lu, G. and Fei, B., 2014. Medical hyperspectral imaging: a review. Journal of biomedical optics, 19(1), p.010901.

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