

# Bachelor/Master Thesis



Technische Universität München

## Image fusion of hyperspectrometry and microscopy: a multimodal study of two-dimensional van der Waals structures



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### 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. From remote sensing to industrial quality inspection, spectral imaging acts as a strong tool for sensing the world around us.

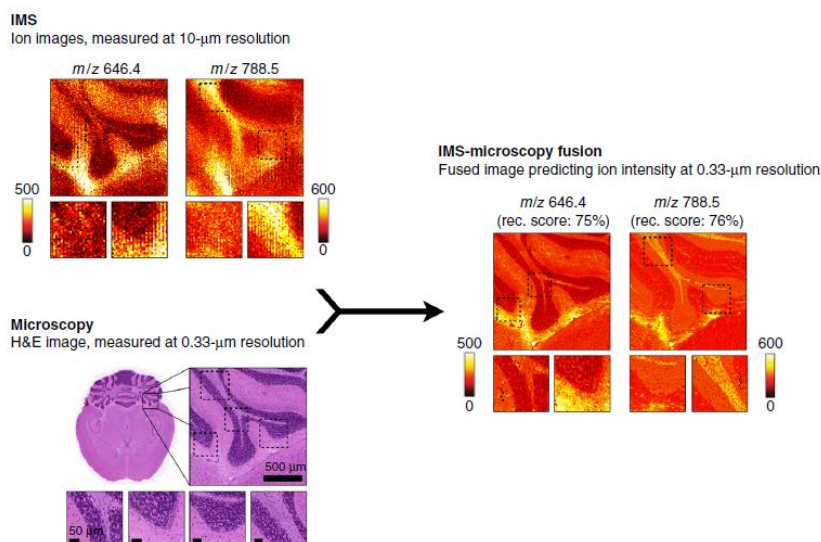
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### Scope

To make better use of the hyperspectral information acquired by our customly-built setup, image fusion will be employed to better understand the information and physical mechanisms. The objective of image fusion is to merge information from several source images into a single image or to deliver a more accurate description of an imaged sample. The imaged target will be two-dimensional heterostructures ( $\text{MoS}_2$  on  $\text{SiO}_2/\text{Si}$  substrate) which is a hot research area for potential optoelectronic applications.

### Reference

Van de Plas, Raf, et al. "Image fusion of mass spectrometry and microscopy: a multimodality paradigm for molecular tissue mapping." *Nature methods* 12.4 (2015): 366.

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