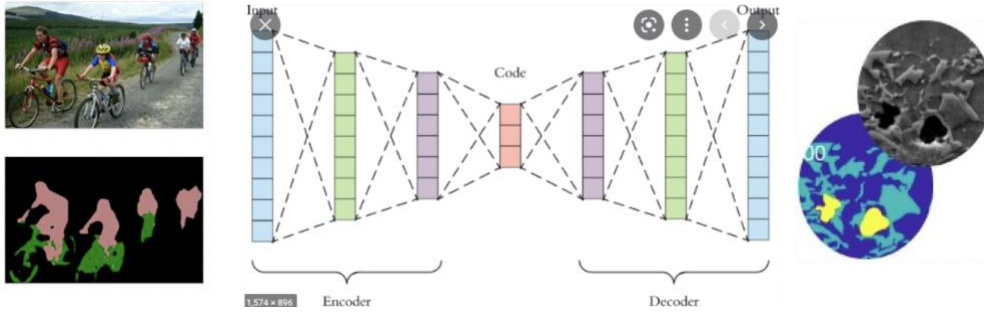


Unsupervised Semantic segmentation of electron microscopy images

Institut für
Metallkunde und
Materialphysik

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Motivation:



To improve the mechanical and functional properties of metals and materials, we must study their microstructure. Deep learning and in particular image segmentation has been used in electron microscopy for years to investigate the microstructure. Semantic segmentation can help us find and quantify phase fractions and defects in electron microscopy images.

However, for the supervised image segmentation, long and tedious labeling of the data is required. Although we want to use large datasets to improve the segmentation quality, the bigger the dataset, the harder the labeling. Therefore, current research is focusing on unsupervised and semi supervised methodologies to do the segmentation and classification tasks without having to label data.

Task:

- Unsupervised semantic segmentation of electron microscopy images from both IMM and MCH departments

What we offer:

- Experience in state-of-the-art machine learning methods and algorithms
- Access to valuable electron microscopy data to learn from both IMM and MCH departments
- Working with a young and enthusiastic team
- A high-ranking publication/conference presentation of results

The ideal candidate will have:

- high motivation for developing and implementing machine learning - deep learning-based algorithms on images.
- Programming skills (preferably Python), some familiarity with Pytorch or TensorFlow.
- Any engineering, physics, mathematics background.

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