



A Clustering-based Pre-training Method for Remote Sensing Semantic Segmentation

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Introduction

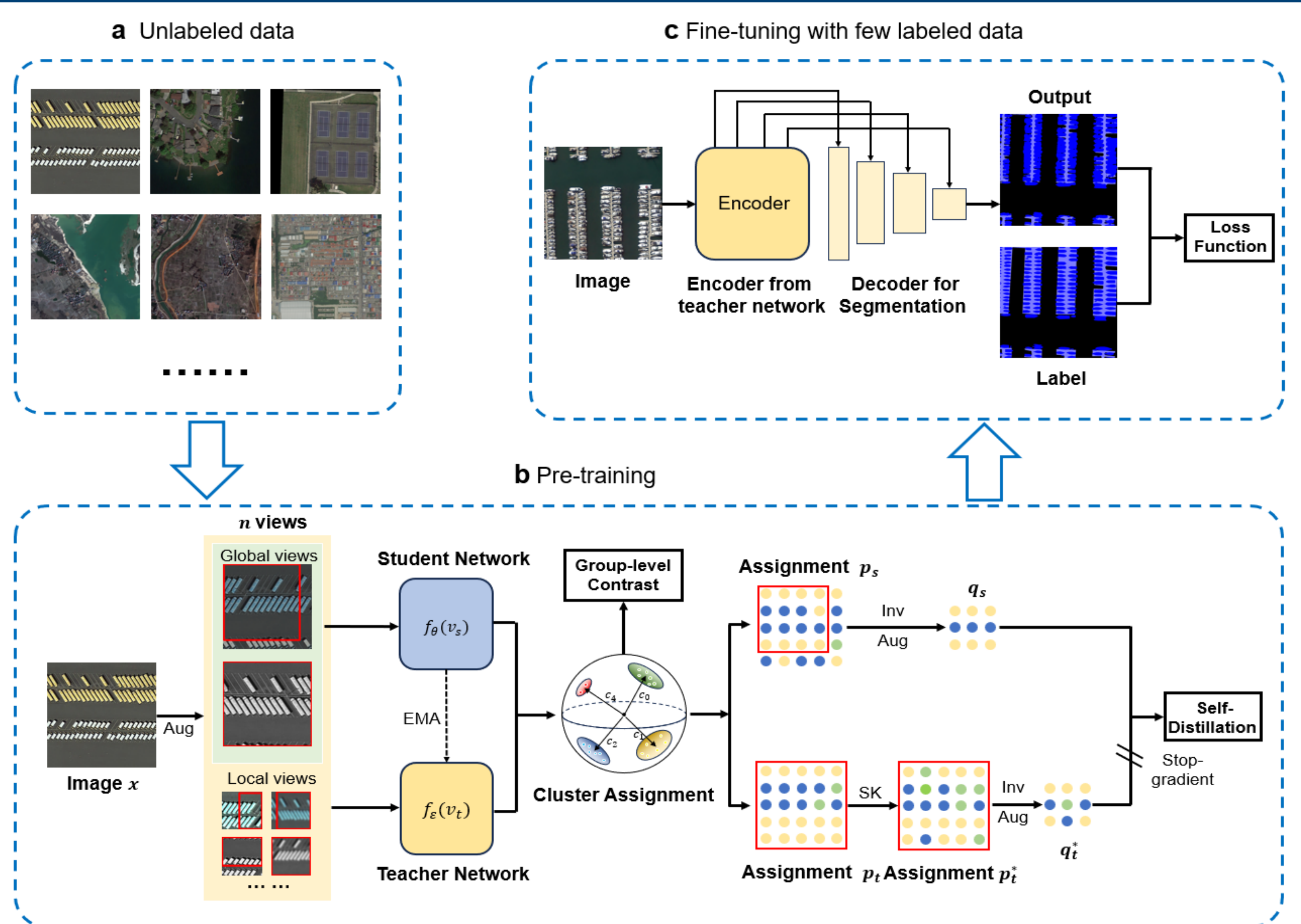
- Remote sensing semantic segmentation plays a crucial role in applications such as environmental monitoring and natural resource management.
- Most of these methods depend on supervised learning, necessitating a substantial number labeled data for training deep neural networks
- Costly annotations make limited-data remote sensing segmentation models crucial.

Motivation

- Methods based on contrastive learning and MIM are approaches to few-shot semantic segmentation.
- However, most of the pretext tasks of the contrastive learning and MIM are not designed for semantic segmentation.
- This research proposes a clustering-based self-supervised pretraining method for remote sensing semantic segmentation task.

Method

- **Unlabeled data:** A large number of unlabeled data is prepared for pre-training.
- **Pre-training:** A clustering-based pre-training method, which contains five parts: data augmentation, student and teacher networks, cluster assignment module, self-distillation training, and clustering constraint module.
- **Fin-tuning:** After pre-training, a segmentation model can be obtained with few labeled data through fine-tuning.



Results



Building extraction along the river in Shaanxi Province.