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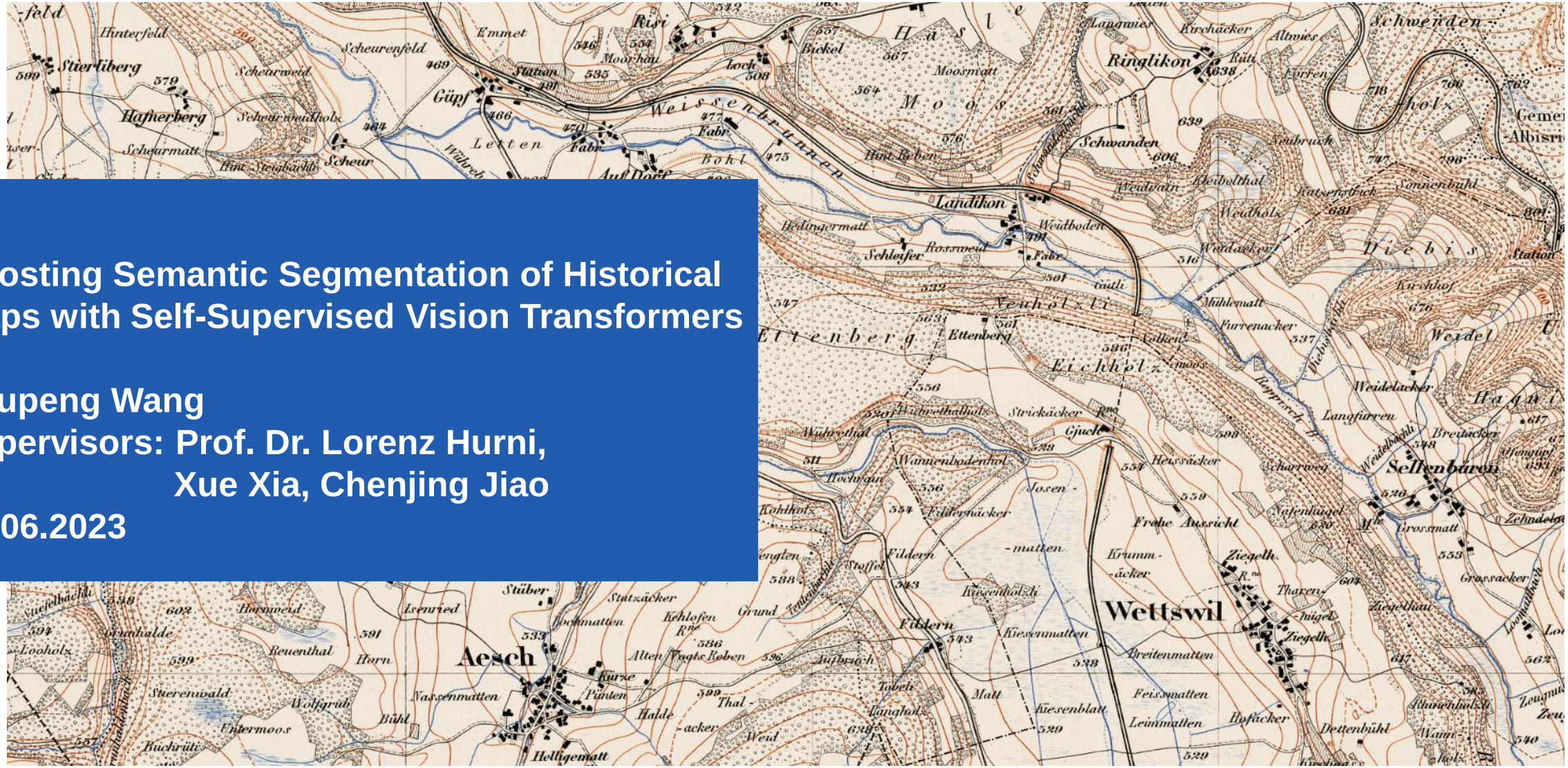

Boosting Semantic Segmentation of Historical Maps with Self-Supervised Vision Transformers

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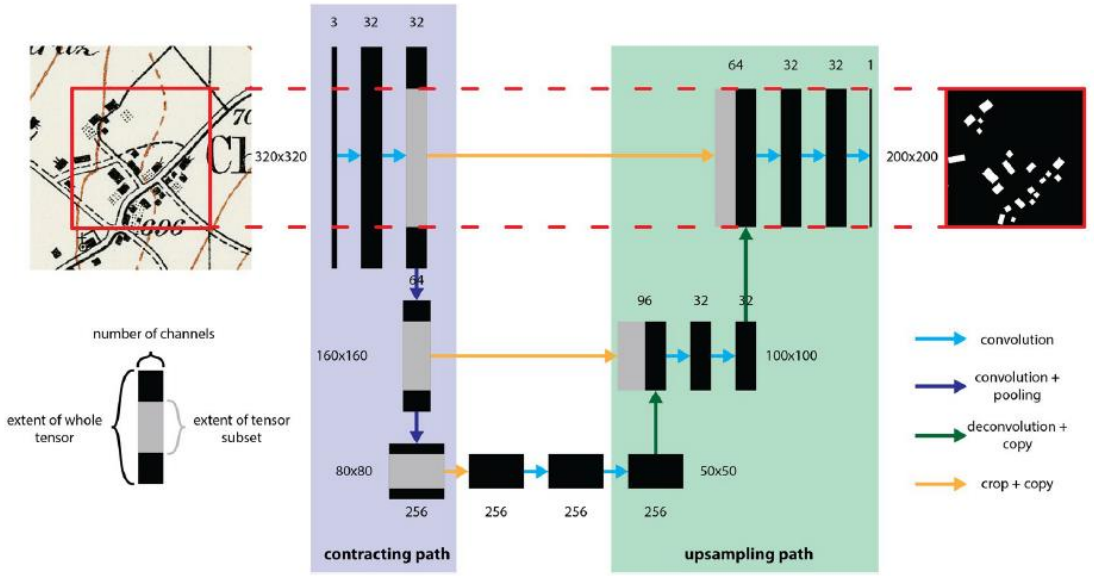
Agenda

1. Background and goals
2. Data
3. Methodology
4. Result
5. Conclusion and future directions
6. Reference

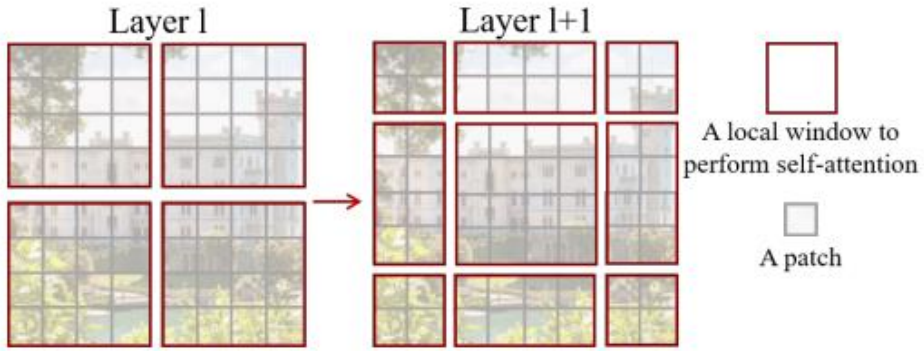
Background and goals



(Heitzler & Hurni, 2020)

CNNs

?



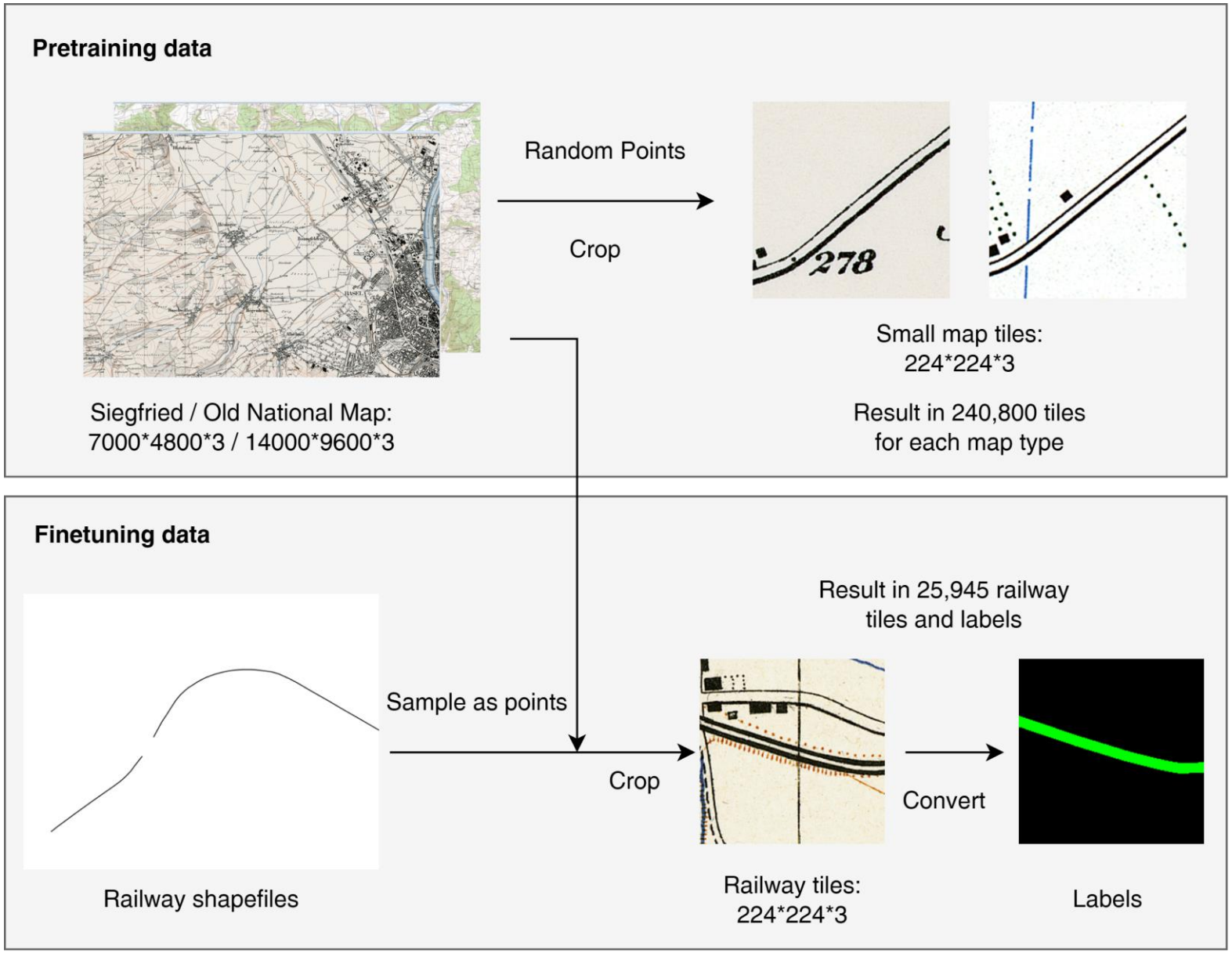
(Liu et al., 2021)

Swin Transformer

(Understanding Contrastive Learning)

Contrastive Learning

Data

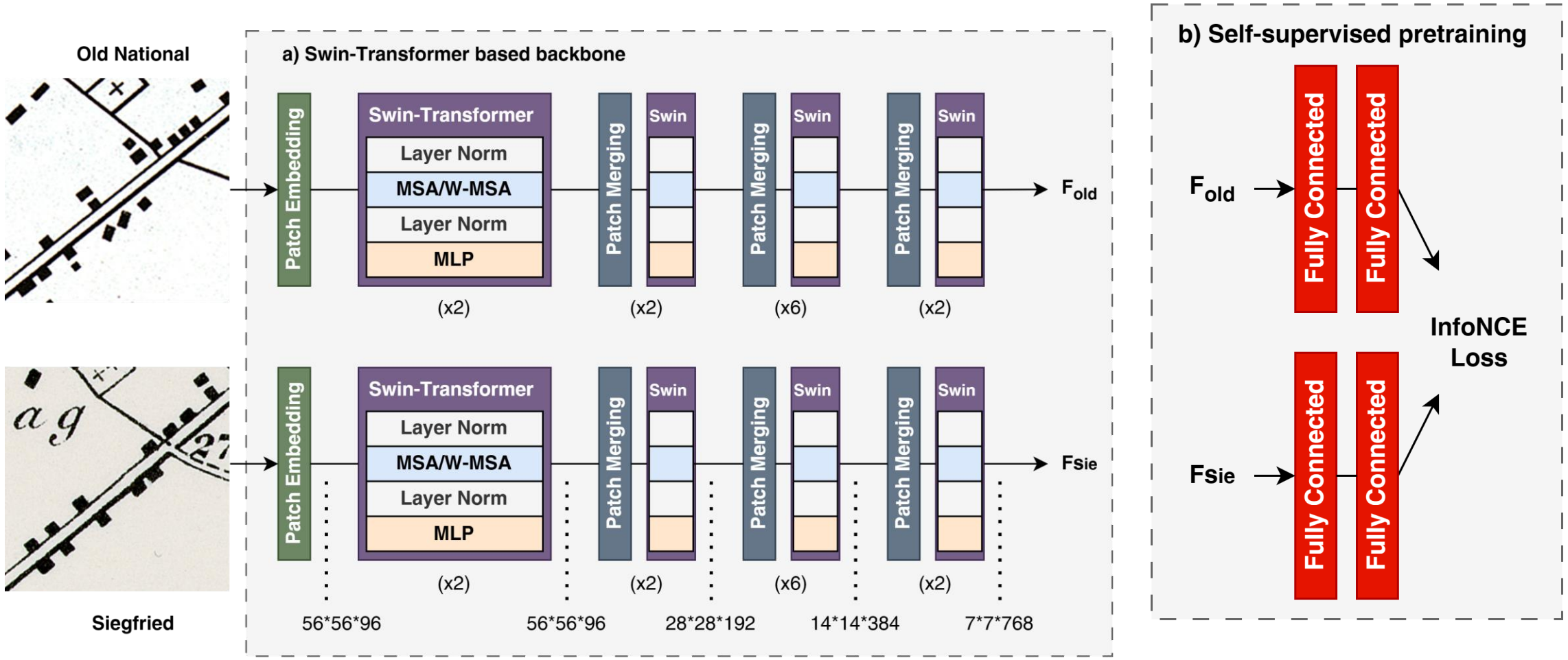


Also mixed with road tiles.

Small datasets are also prepared (10%, 5%, 2.5%)

Methodology

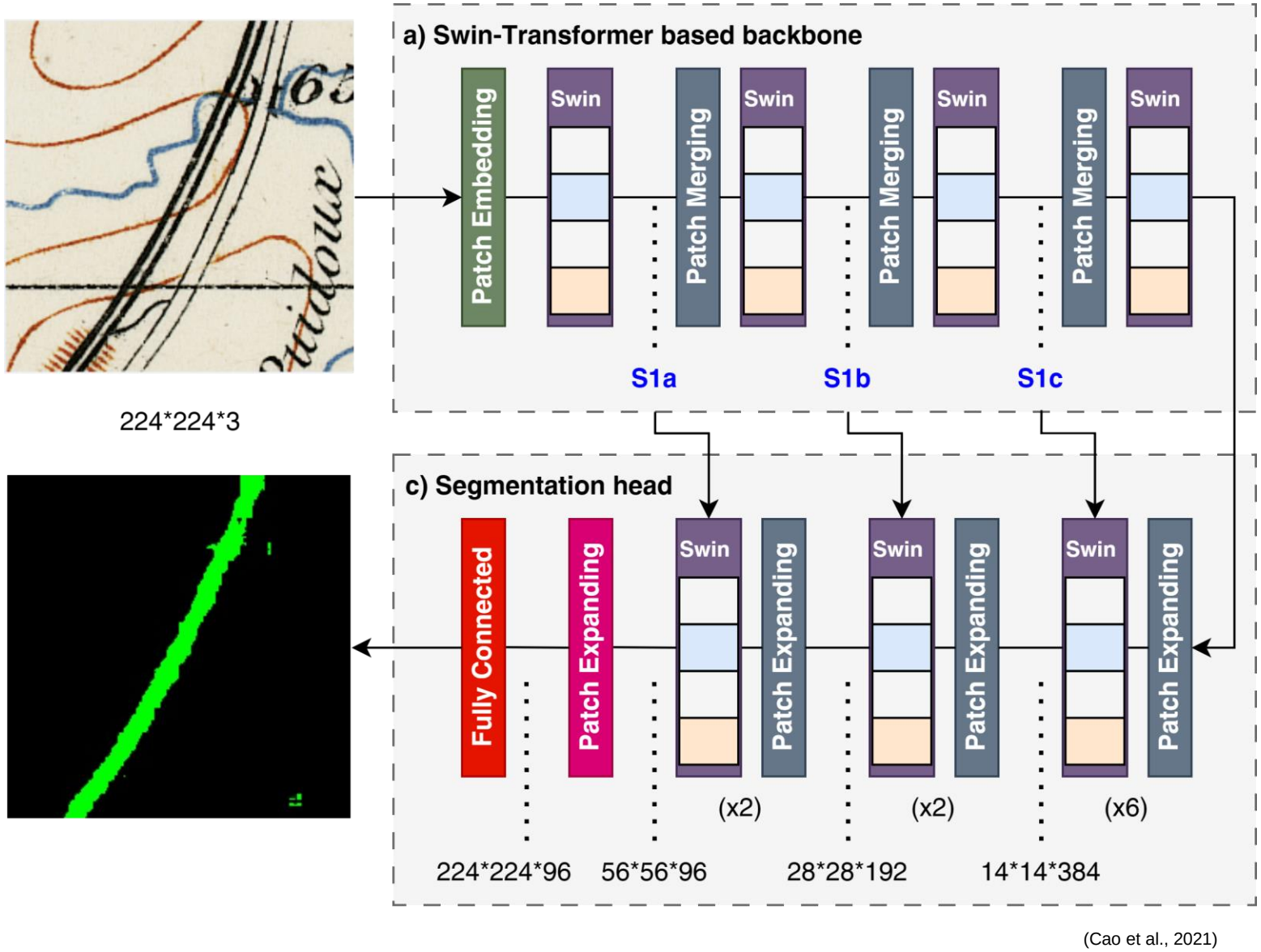
- Pretraining part



(Chen et al., 2020; Liu et al., 2021; Scheibenreif et al., 2022)

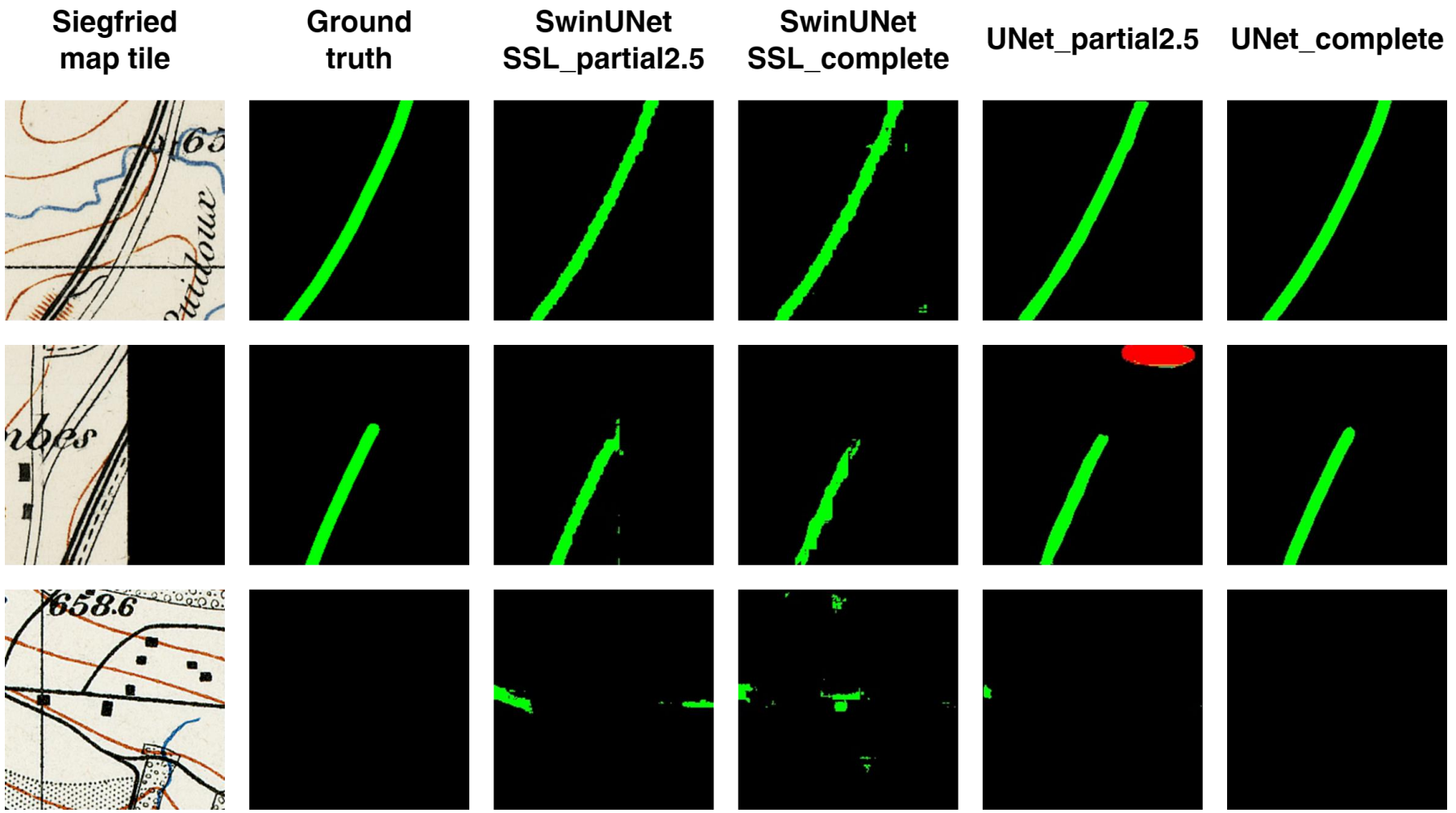
Methodology

- Finetuning part



(Cao et al., 2021)

Result and discussion



Model performance on the semantic segmentation of normal railways

Result and discussion

Conclusion and future directions

Strength

- Good performance with small training dataset
- Efficient training speed

Limitation

- Fair performance with large training dataset
- Difficulty in handling imbalanced training classes

Future directions

- Improve SimCLR performance (batch size + data augmentation)
- Explore alternative pretraining strategies (BEiT or MAE)
- Adopt different loss functions during finetuning (focal loss)

Reference

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