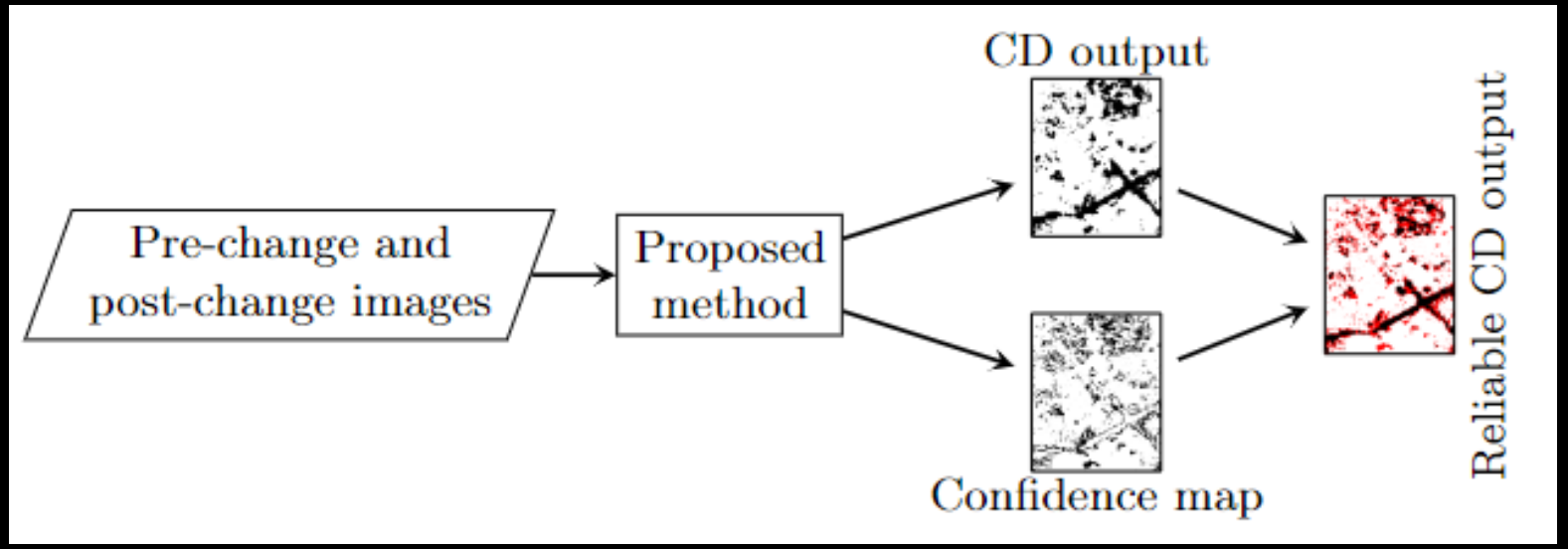
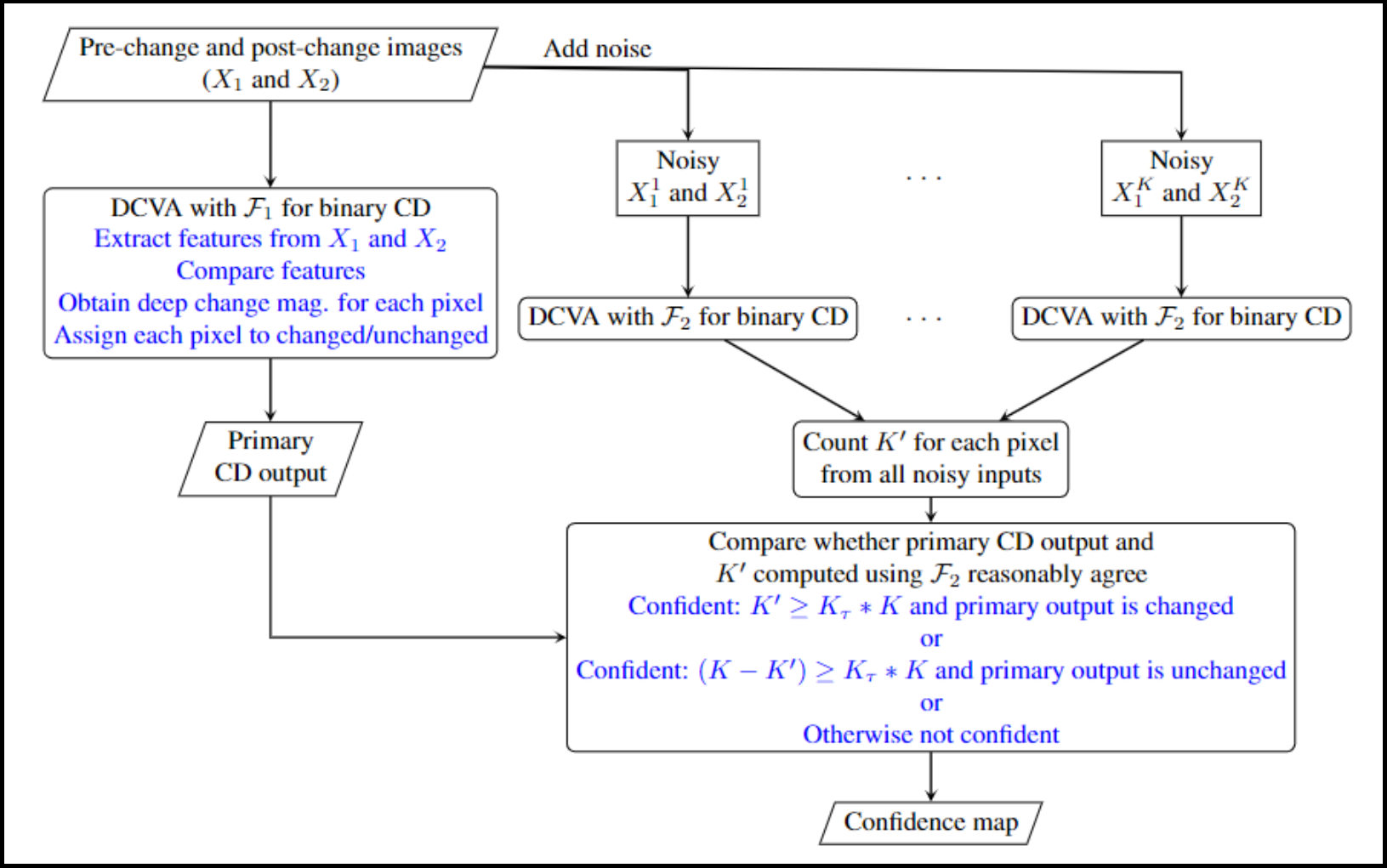
AIL 862

Lecture 23

Confidence Prediction in DCVA

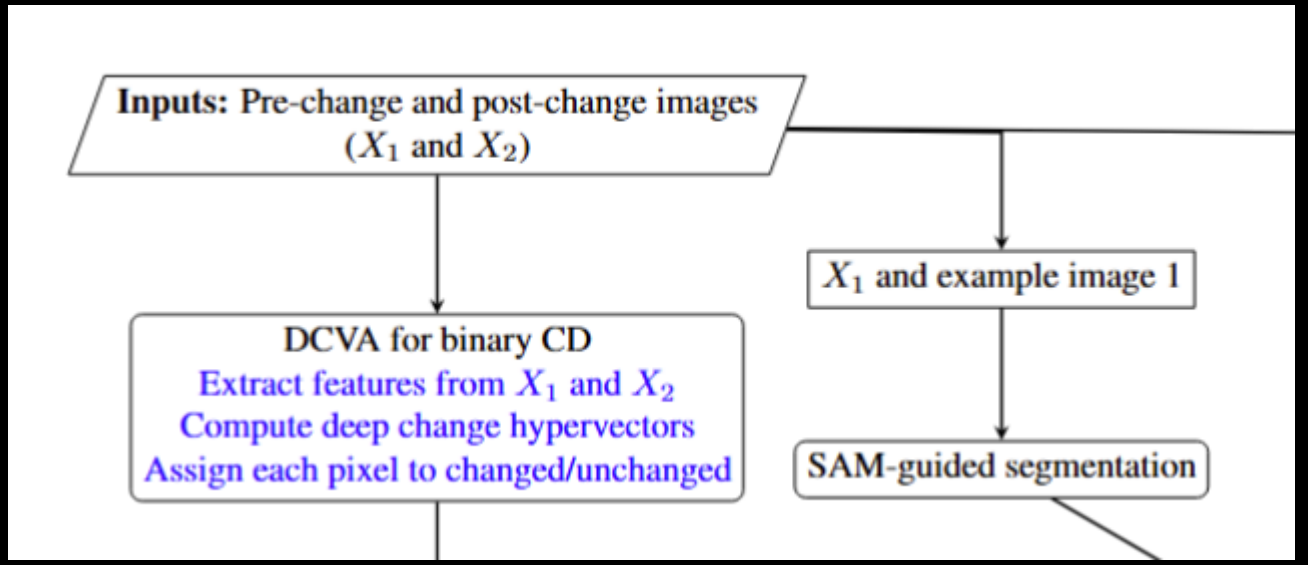


Confidence Prediction in DCVA

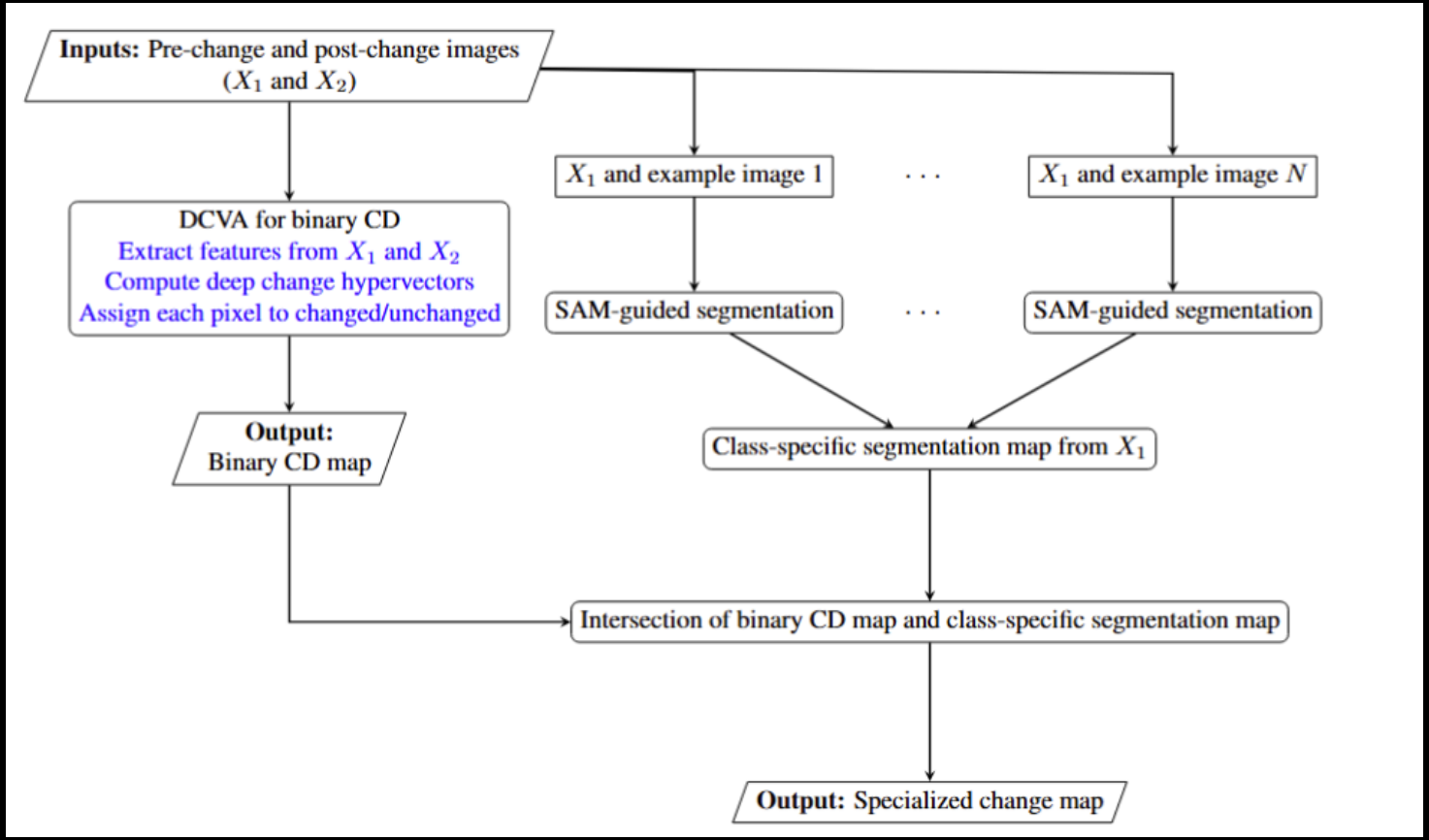


Detecting specialized change with DCVA

Detecting specialized change with DCVA



Detecting specialized change with DCVA



Other possible approaches

- DCVA + supervised training on few examples (maybe with U-Net)

Other possible approaches

- Supervised training on few examples (maybe with U-Net) + post-classification

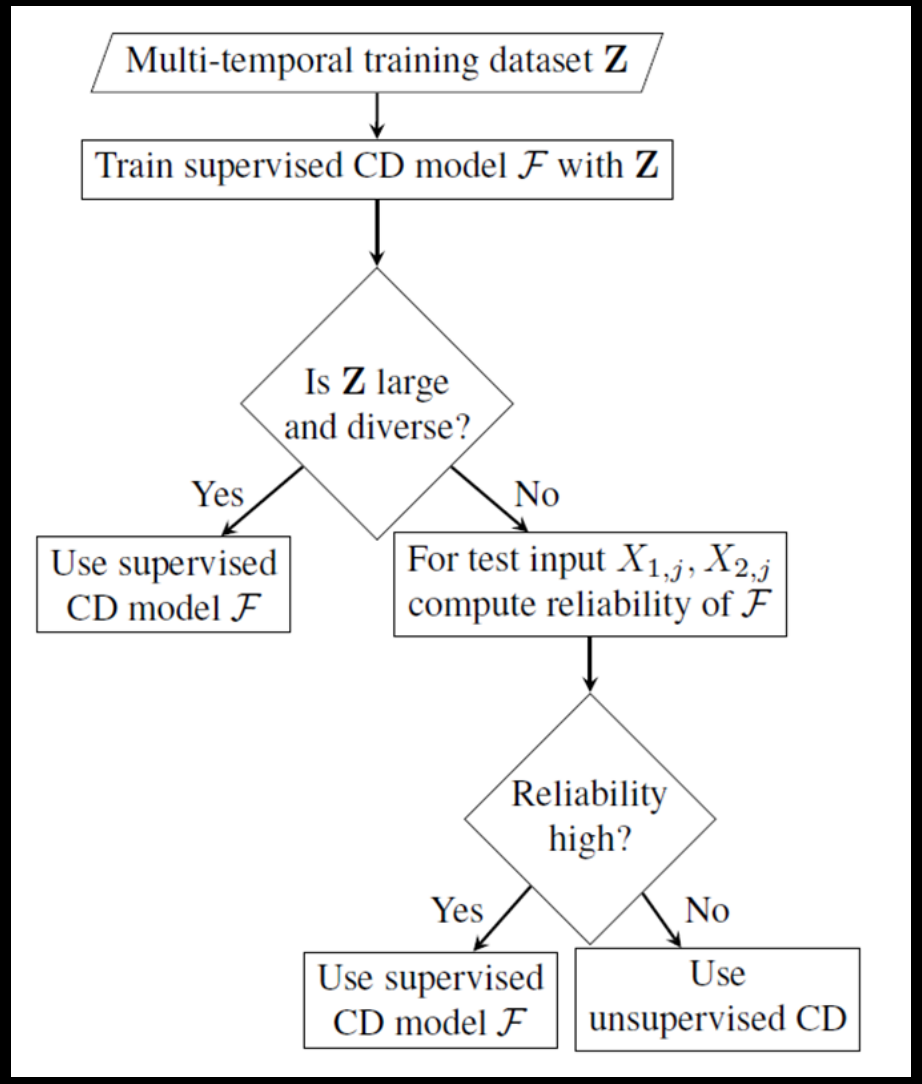
Other possible approaches

- DCVA + CLIP

Supervised CD

- Dependent on availability of training data
- Yields good result if abundant bi-temporal training data is available

Supervised or Unsupervised



Any semantic segmentation architecture can be used for supervised CD. How?

Siamese

Siamese with ViT?

Siamese-Multitask

Supervised CD via unsupervised CD

Deep Supervision

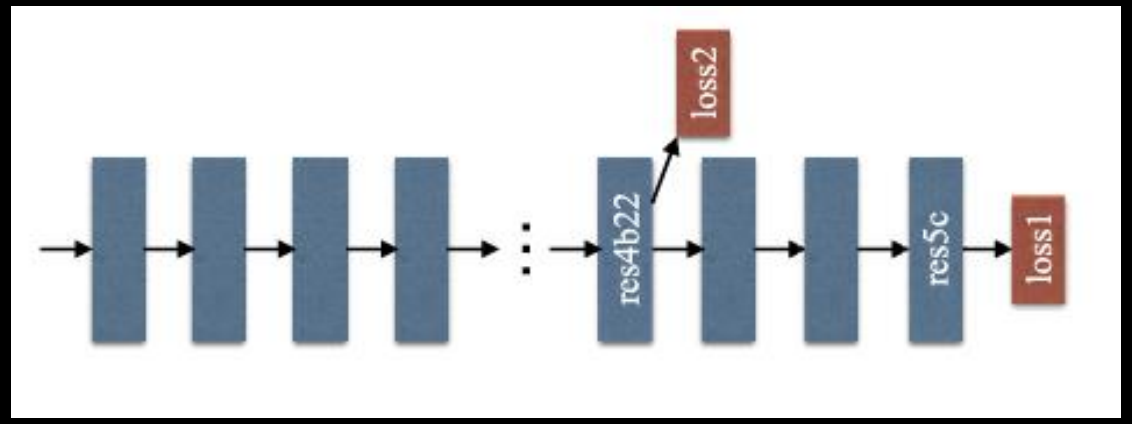


Figure from Pyramid Scene Parsing Network

Deep Supervision

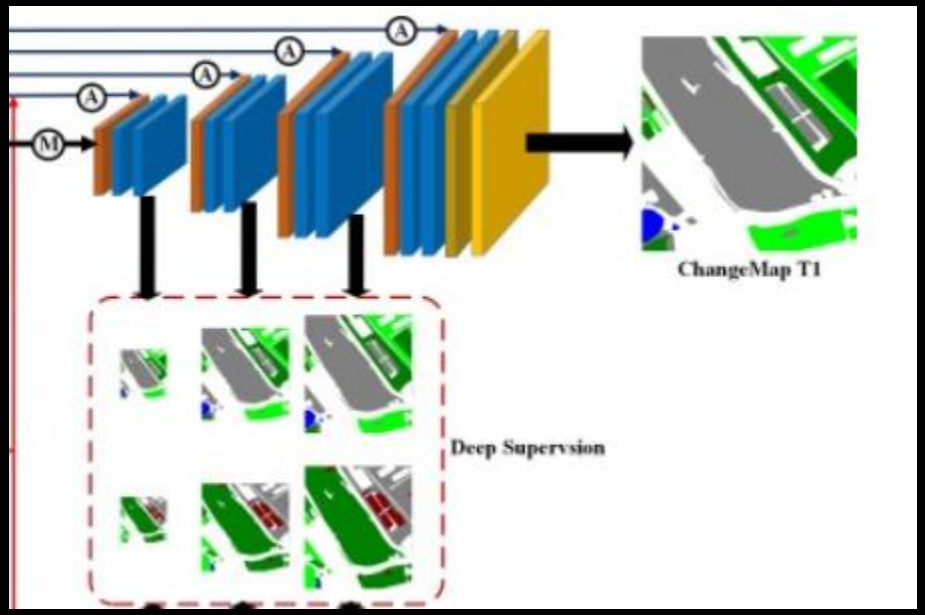


Figure from SCDNET: A novel convolutional network for semantic change detection in high resolution optical remote sensing imagery

Channel attention

- Channel attention is a broader concept that refers to any technique in a CNN that focuses on the importance of different channels within the feature maps.

- “Squeeze-and-Excitation Networks” by Hu et al.

- Seeks to strengthen the representational power of a CNN by enhancing the quality of channel relationships

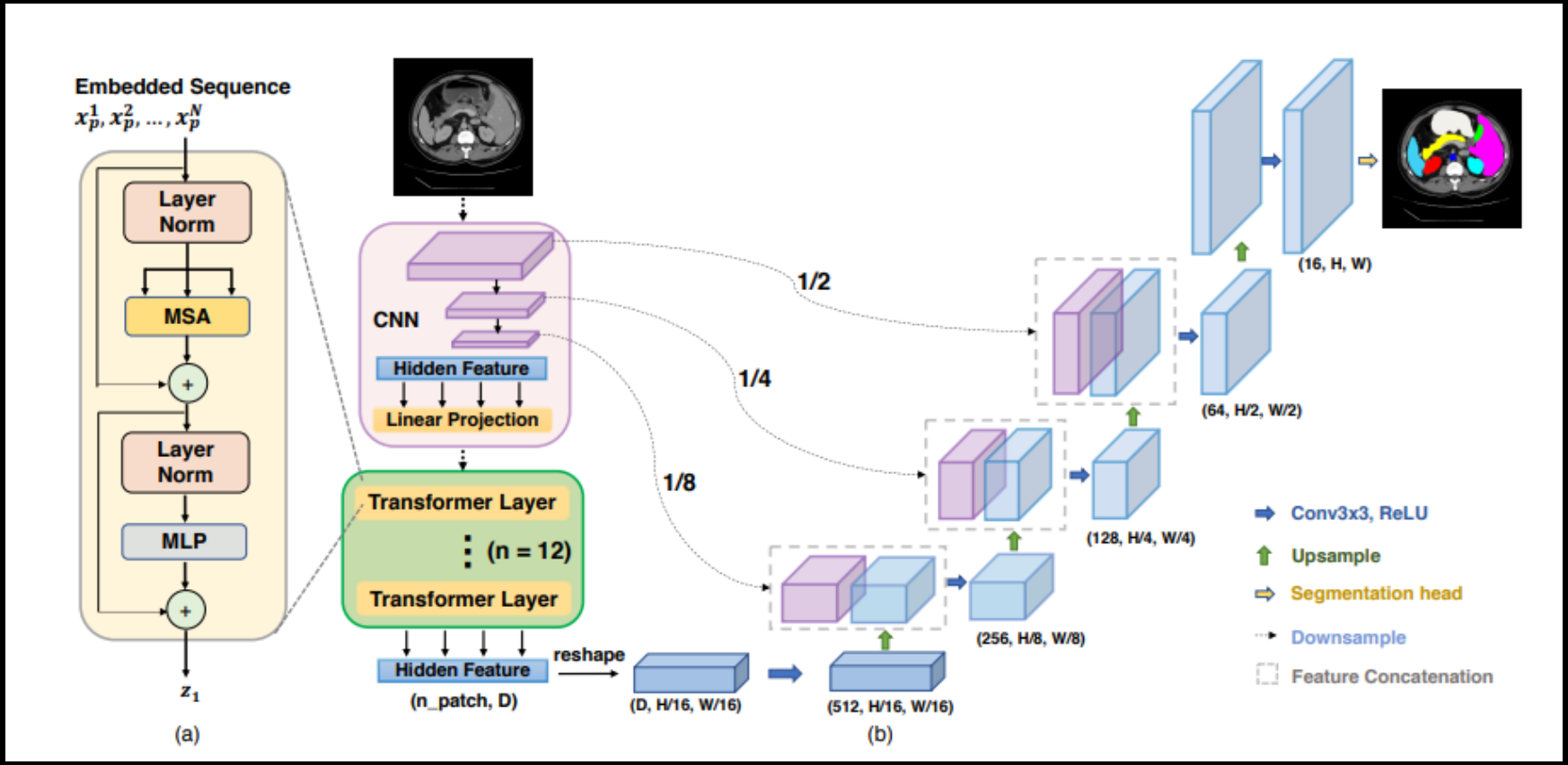
Multi-sensor input

- Multi-sensor Siamese

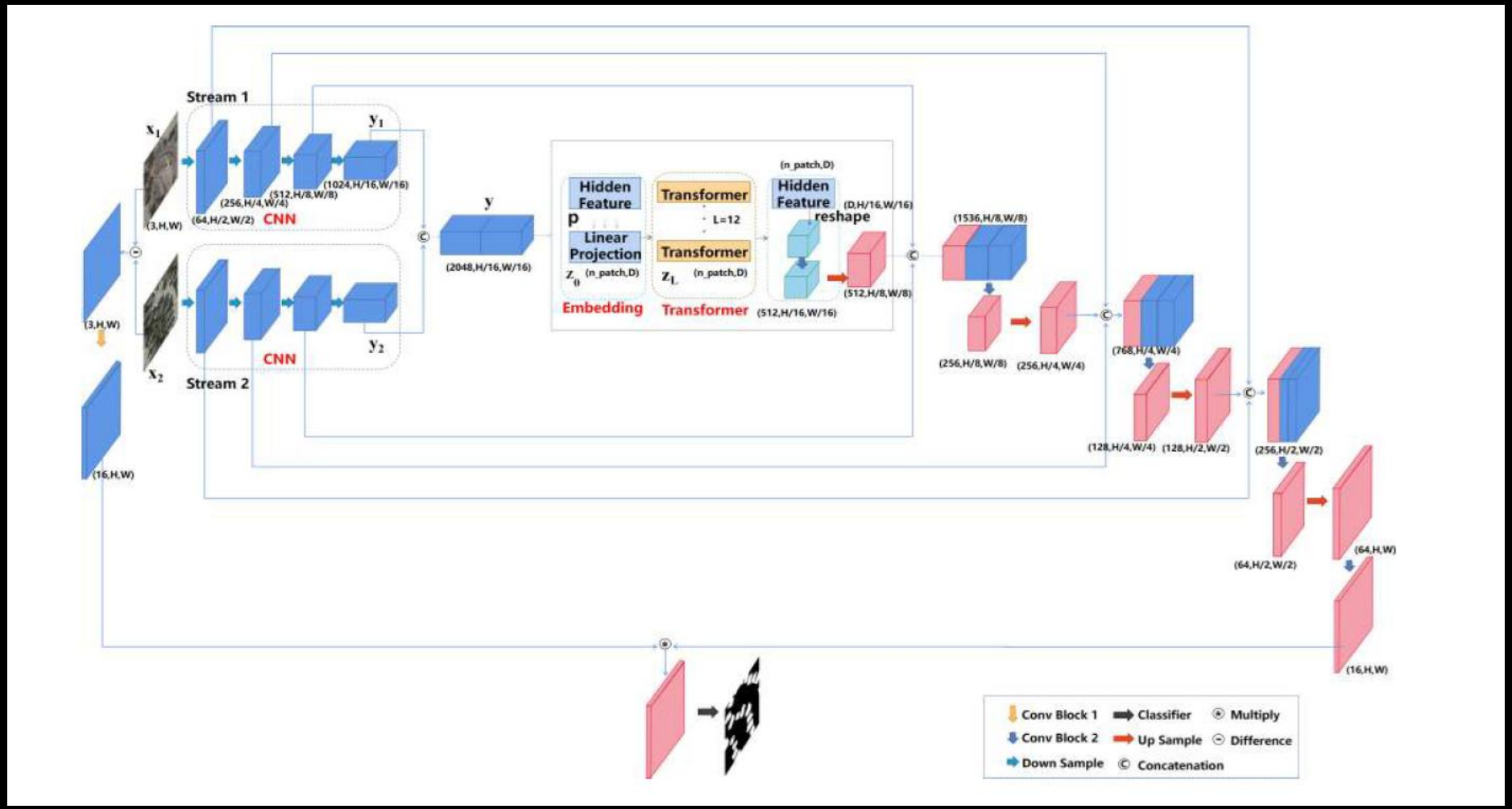
Multi-class output

- Class imbalance
- Concept of few-shot filtering
- Few shot filtering hyperparameters

TransUNet recap



TransUNet CD

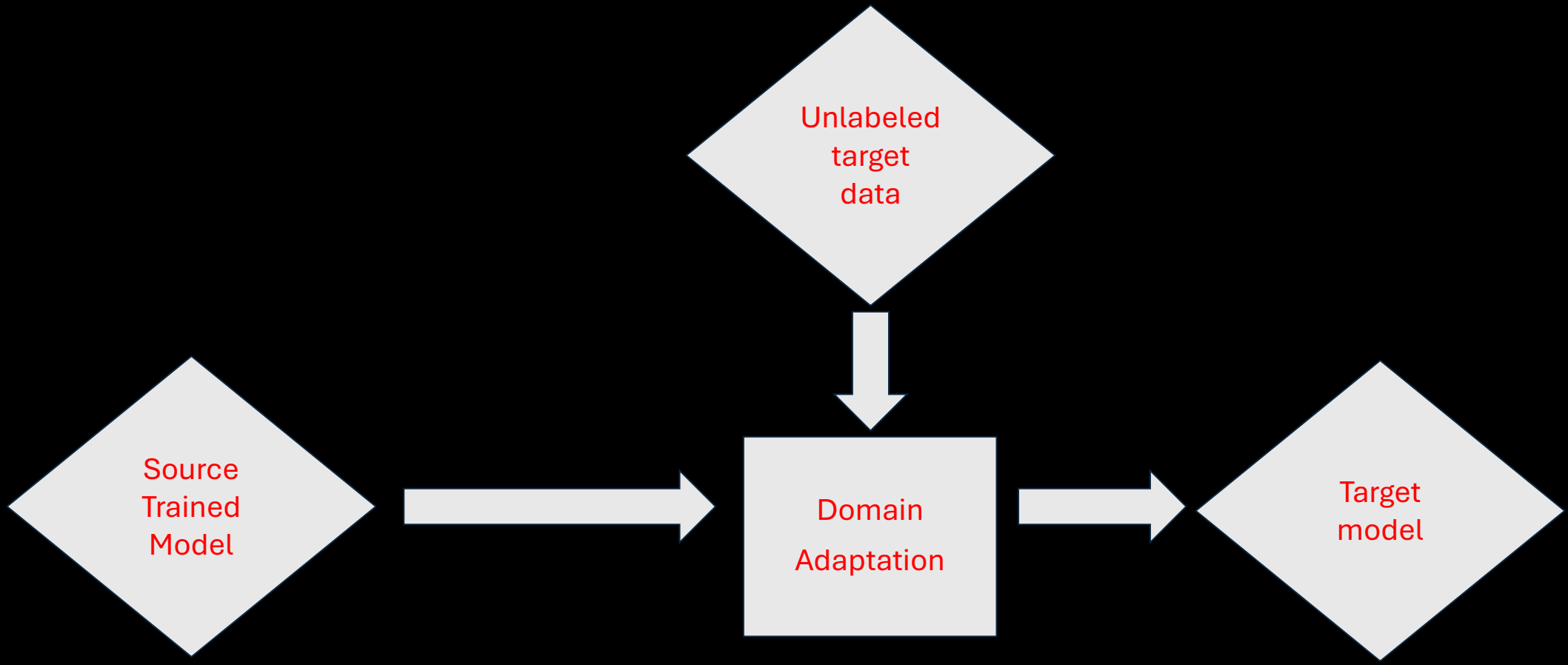


TransUNetCD: A Hybrid Transformer Network for Change Detection in Optical Remote-Sensing Images

Domain Adaptation

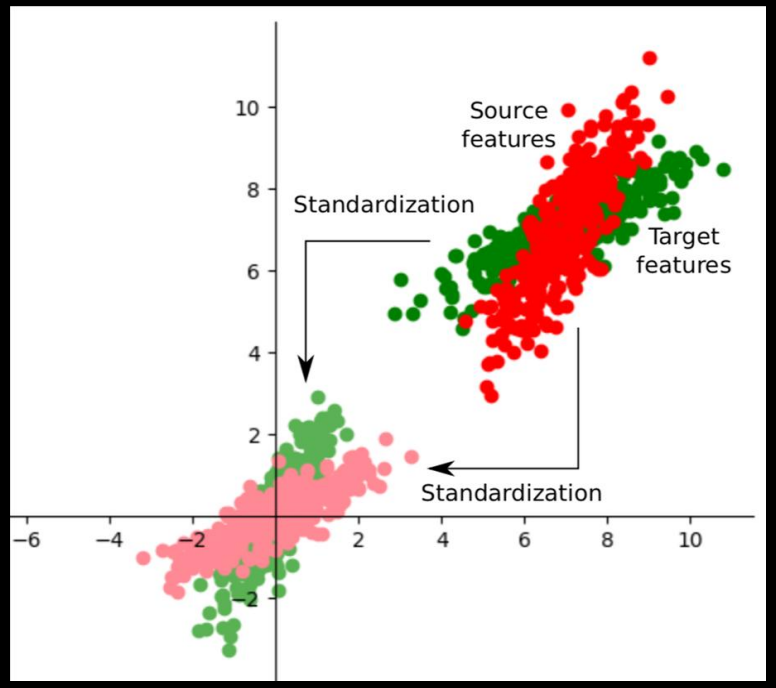
- We briefly covered domain adaptation previously.

Unsupervised Domain Adaptation



Unsupervised Domain Adaptation

Batch Normalization based DA methods align feature distributions through feature standardization by setting mean of features to 0 and variance to 1.



Ack: Subhankar Roy, UniTn for this slide

Batch Normalization

- Generally, running mean and variance are estimated during training.

- However, BN (for domain adaptation) suggests to estimate the above from test time minibatches.

Unsupervised Domain Adaptation

- Domain Translation (GAN? However, why not used so much?)

Unsupervised Domain Adaptation

- Domain Confusion / domain adversarial training