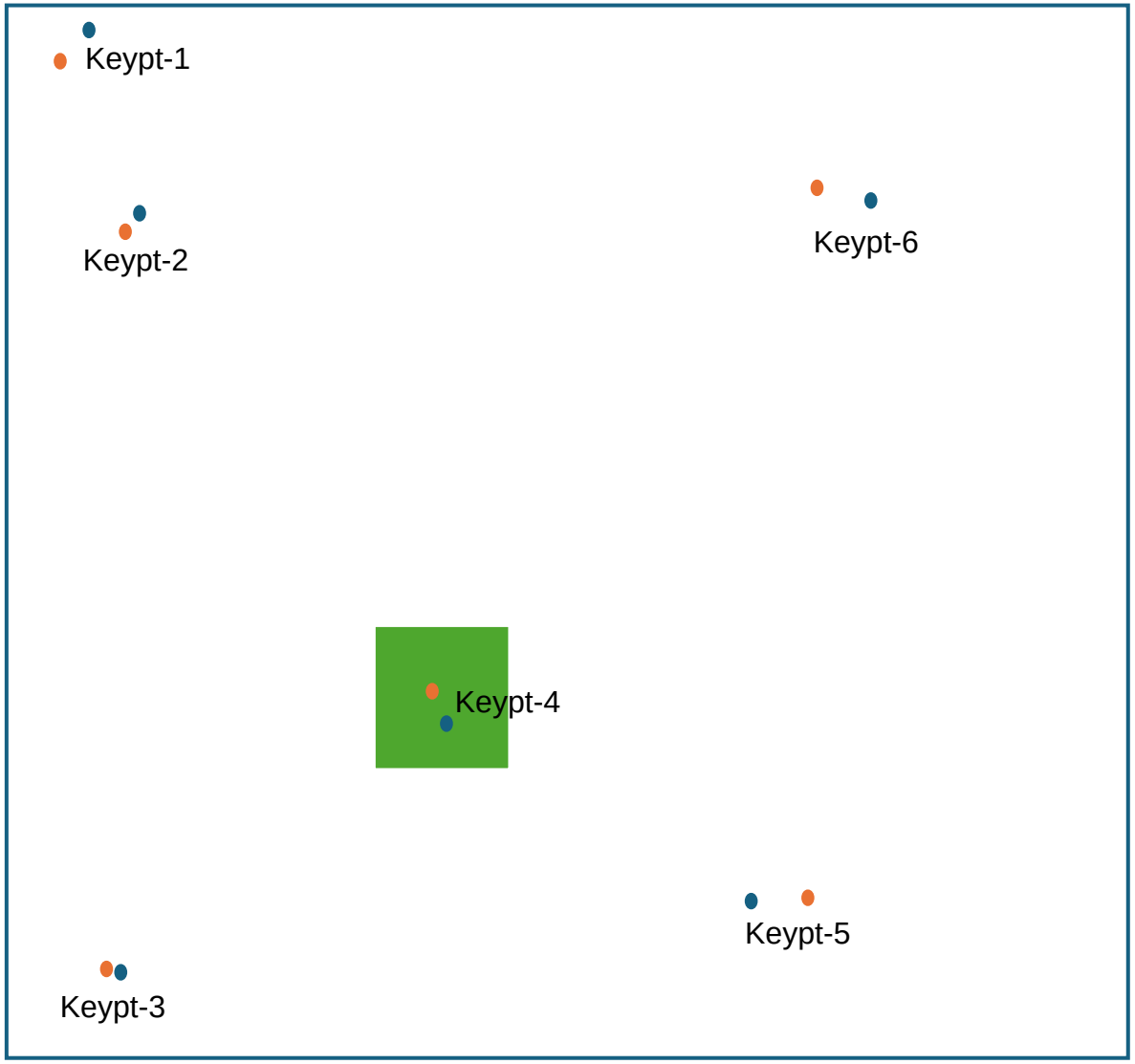
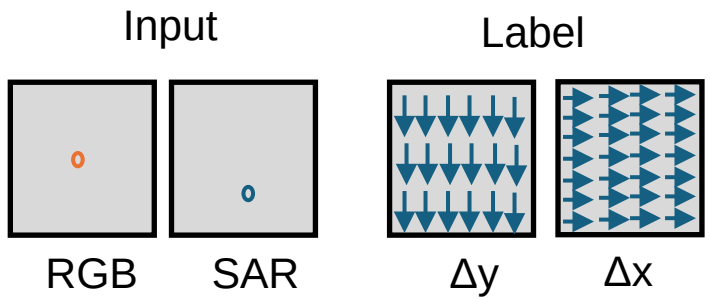
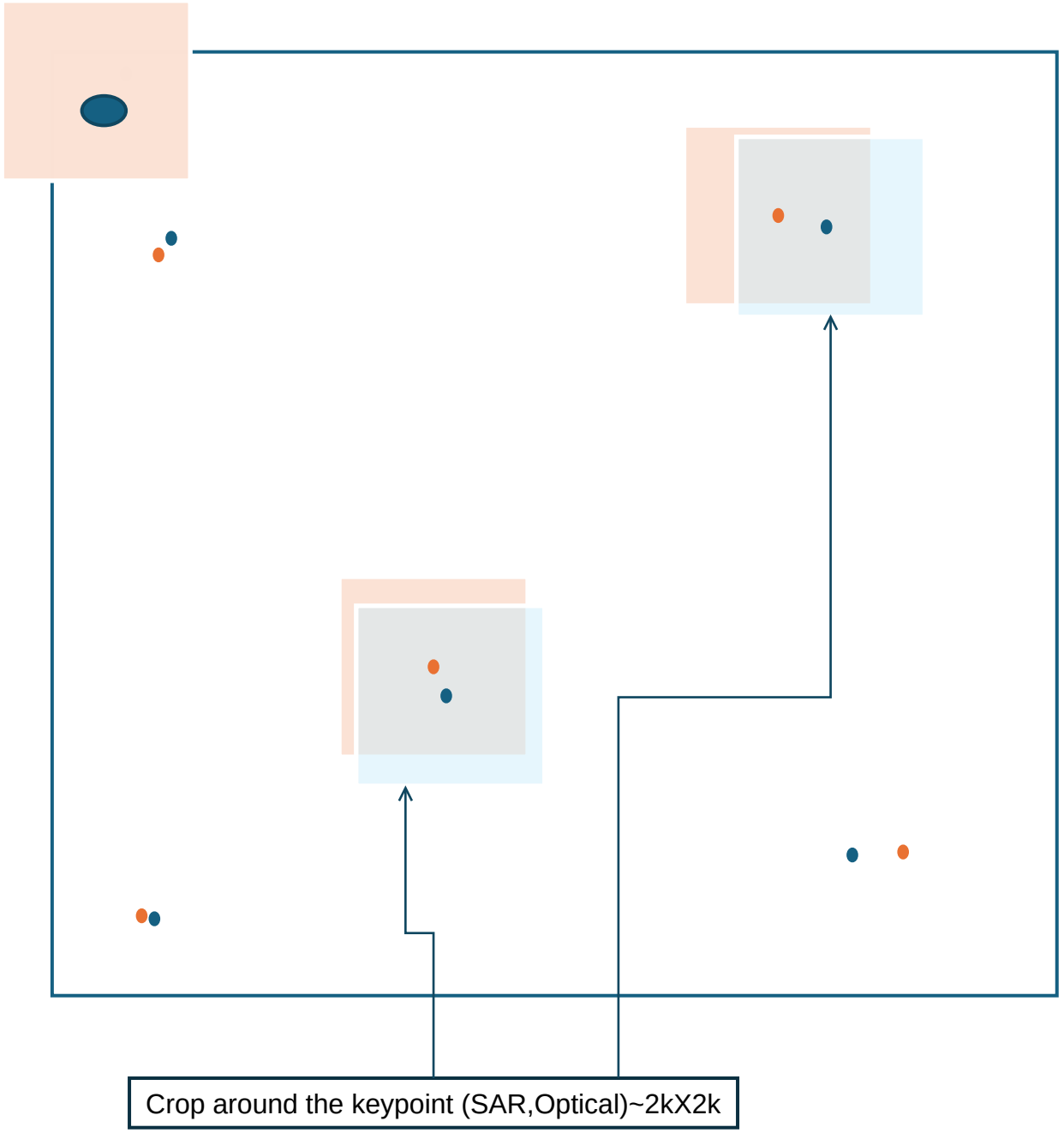
Proposal



RGB Keypoints

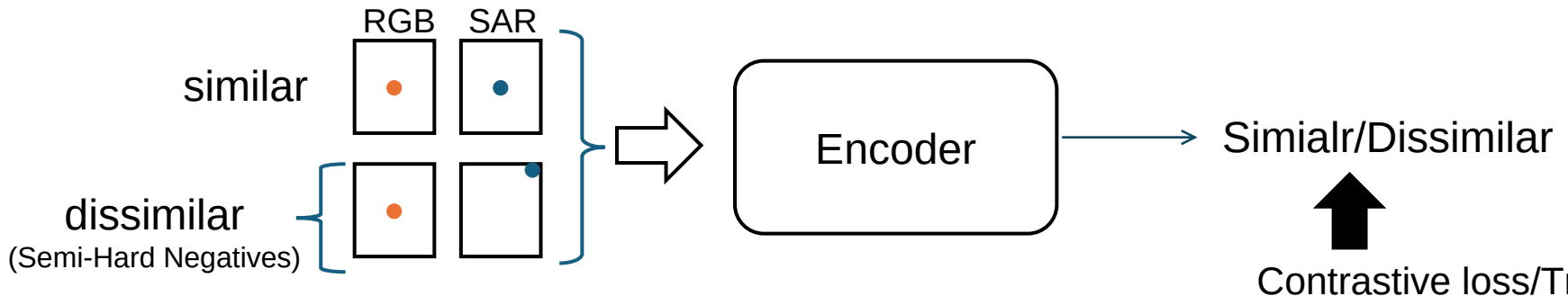
SAR Keypoints




RGB Keypoints
SAR Keypoints
Crop around the keypoint (SAR,Optical)~2kX2k

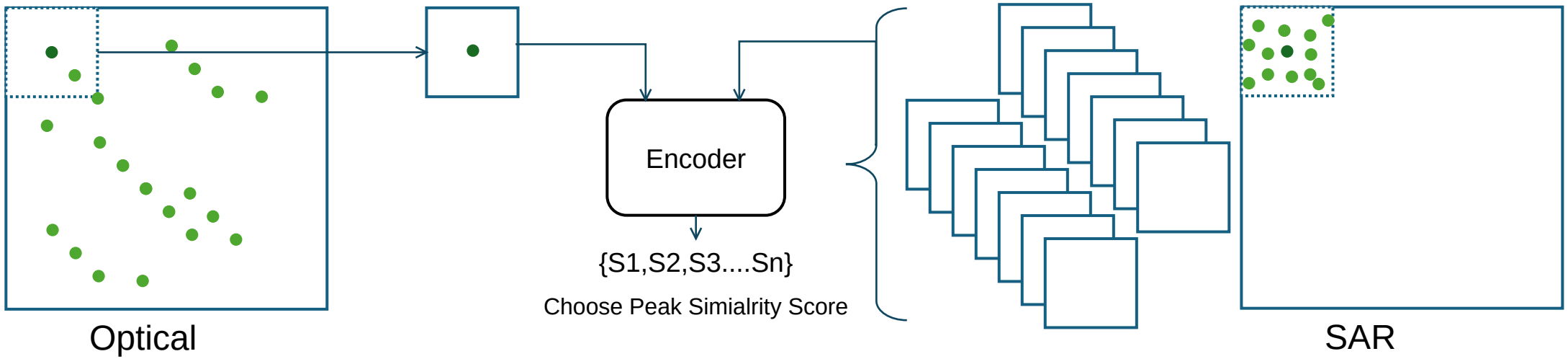
Option1: Contrastive Learning

Training Phase



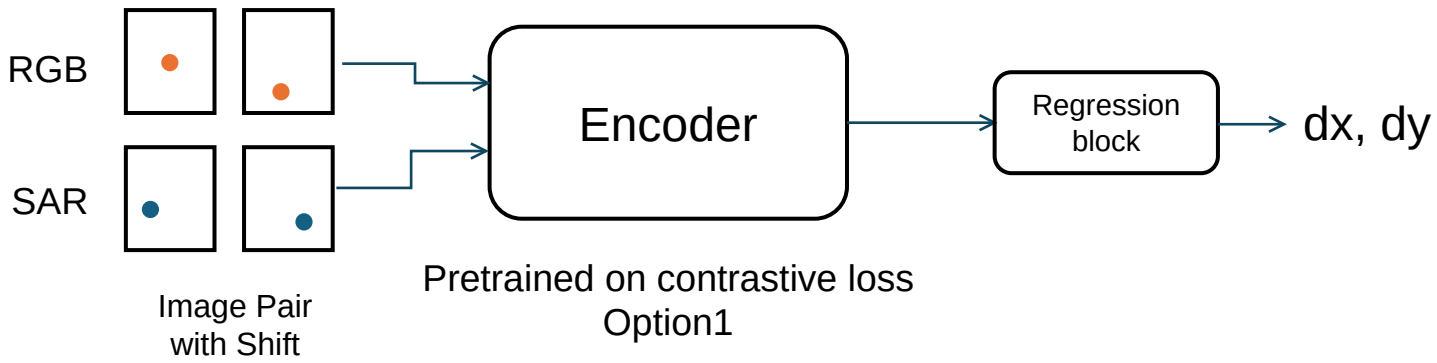
- Encourages embedding vectors of matched SAR-optical patches to be close.
- Embeddings from unrelated patches should be far apart.

Evaluation/Deployment Phase



Option2: Siamese Model

Training Phase



Stage	Description
Input 3	SAR-optical image pairs, 750 matched keypoints
Phase 1	Train ResNet encoder using contrastive loss with distance-weighted sampling
Phase 2	Use encoder in a Siamese setup to predict (dx,dy) via regression
Deploy	Option 1: Exhaustive search in embedding space Option 2: Dense shift prediction via sliding window regression

Inference