Anatomy-Aware Self-Supervised Learning for Aligned Multi-Modal Medical Data

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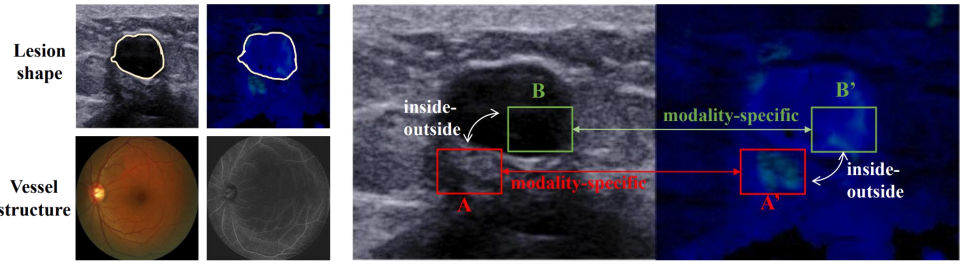
What Happened in Different Modalities?

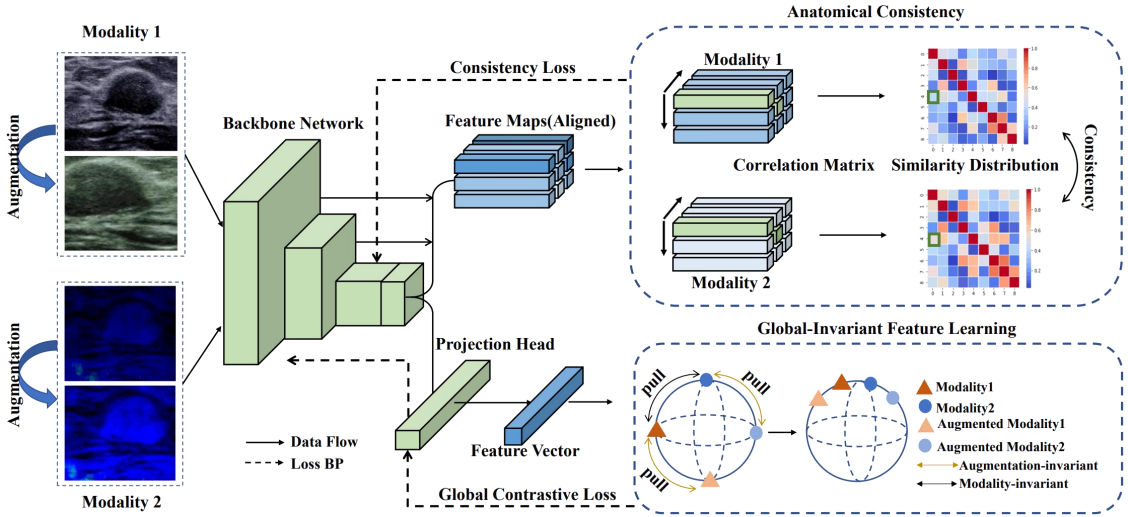
Both anatomical similarity and modality-specific attributes exist.



Directly applying dense contrastive methods to multi-modality data would be sup-optimal: they simply pull corresponding regions closer in feature space , but **modality-specific attributes incur a strong bias**.

Our Method

In this work, we propose a novel **anatomy-aware** self-supervised learning method for multi-modality data. **Spatial similarity distribution** is explored to reflect the variations among anatomical structures.



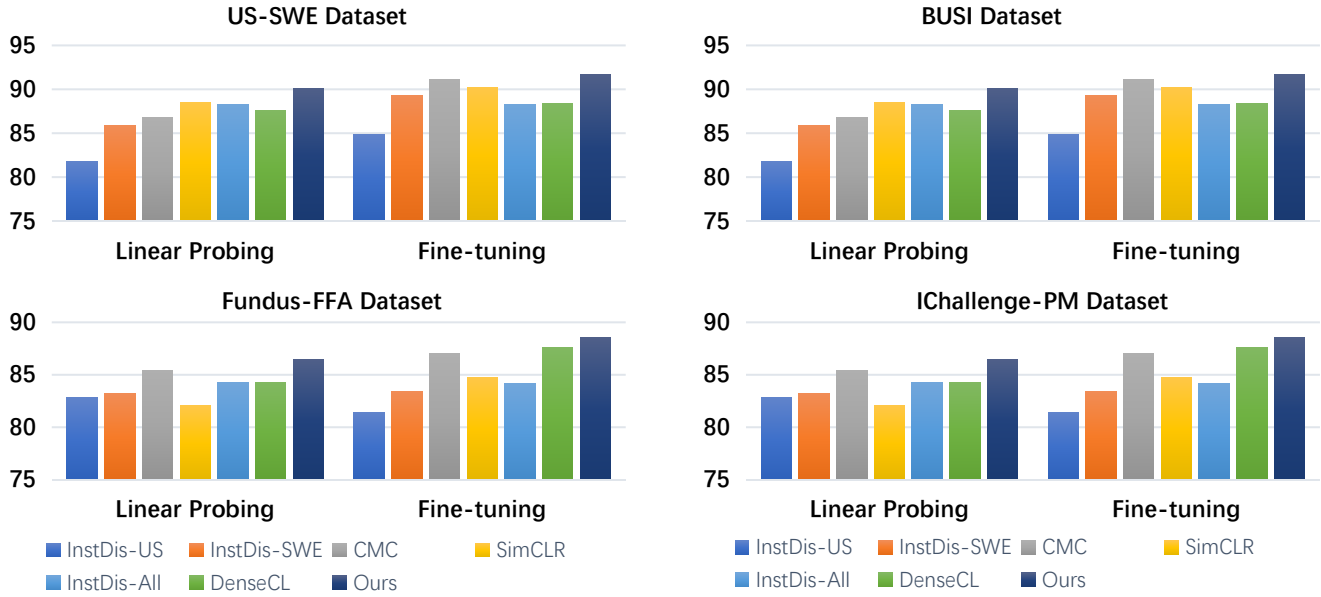
Experiments

Two Datasets:

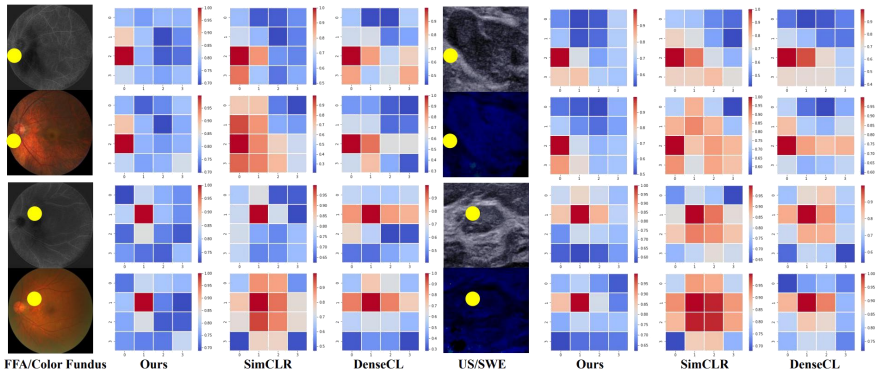
- US-SWE: ultrasound and shear wave elastography
-Fundus-FFA: color fundus and fundus fluorescein angiography for retinal disease

Transfer to Other Datasets:

- BUSI: breast ultrasound
- IChallenge-PM: color funds for diagnosis of pathological myopia



Qualitative Results——Similarity Distribution



-Given the same anchor (yellow), our proposed method obtains more consistent similarity distribution across modals .

- Our method captures better anatomy consistency