

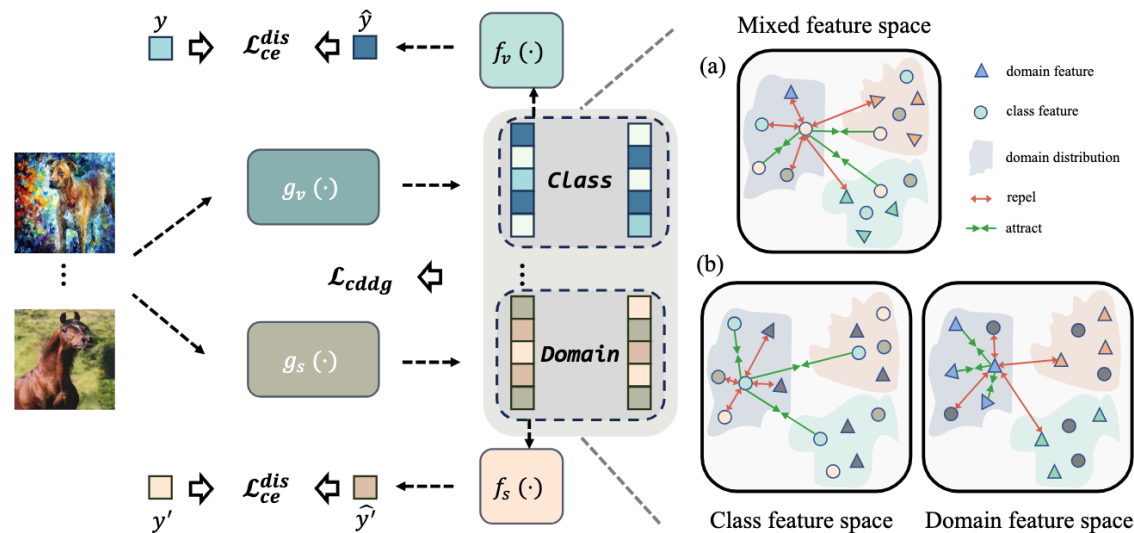
Embracing the Overlooked: Harnessing Feature Disentanglement for Cross- Domain Learning

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Problems & Ideas

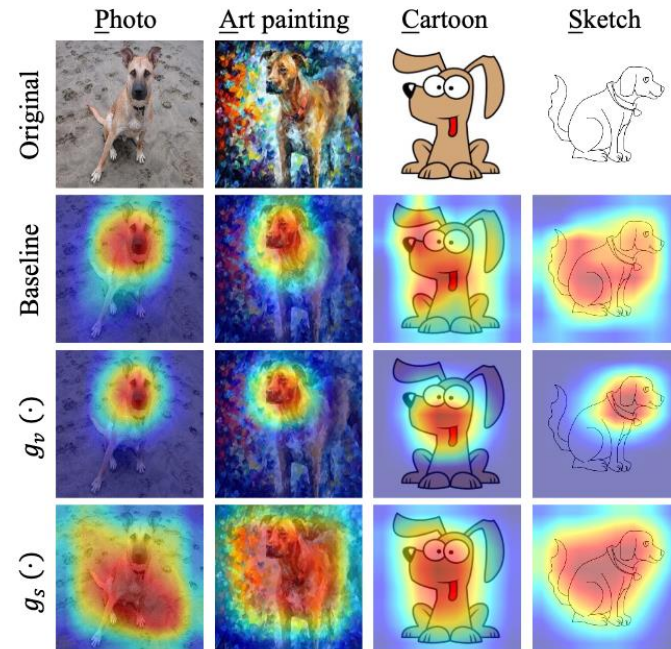
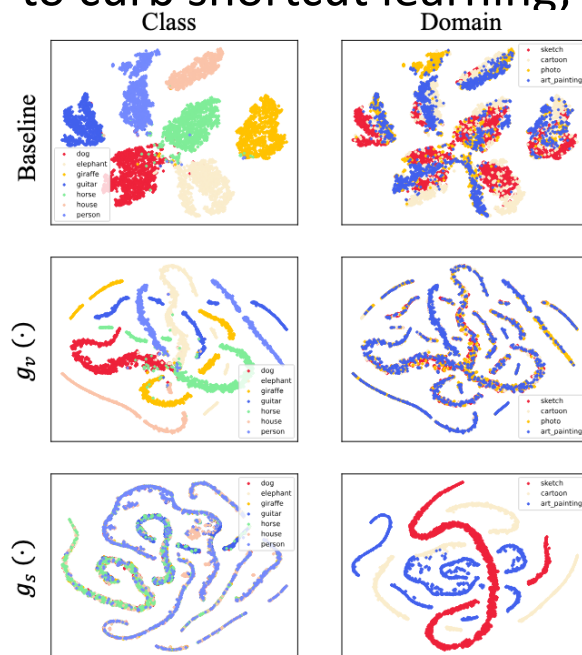
- Problems of conventional stereo matching approaches:
 - Models trained under i.i.d. assumptions entangle class cues with domain artifacts causing sharp accuracy drops under distribution shift.
 - Existing domain generalization methods tend to overlook the irrelevant domain features, discarding useful constraints.
- Ideas: Two-branch disentanglement: one branch learns class-invariant features, the other captures domain traits.



The input images are first fed into class feature extractor and domain feature extractor. After that, class feature classifier and domain-specific feature classifier are employed to predict class label and domain label. There are two ways of mapping two features from one sample. The first is mapping both class feature and domain feature into one mixed feature space; the other is to individually map one single type of feature into one feature space, and take the other type of feature as extra negative samples.

Main Contributions

- Contributions:
 - A two-branch framework (class-invariant vs. domain-aware) trained with supervised contrast; cross-domain differences act as hard negatives. A compact mixed-label mapping further limits capacity to reduce overfitting;
 - View domain cues as *structured constraints* rather than pure noise, and explicitly disentangle class-relevant signals from domain artifacts to curb shortcut learning;



Analysis of the method. Left: t-SNE visualization; Right: Areas of interest of models (GradCAM).