Cross-domain Semantic Decoupling for Weakly-Supervised Semantic Segmentation

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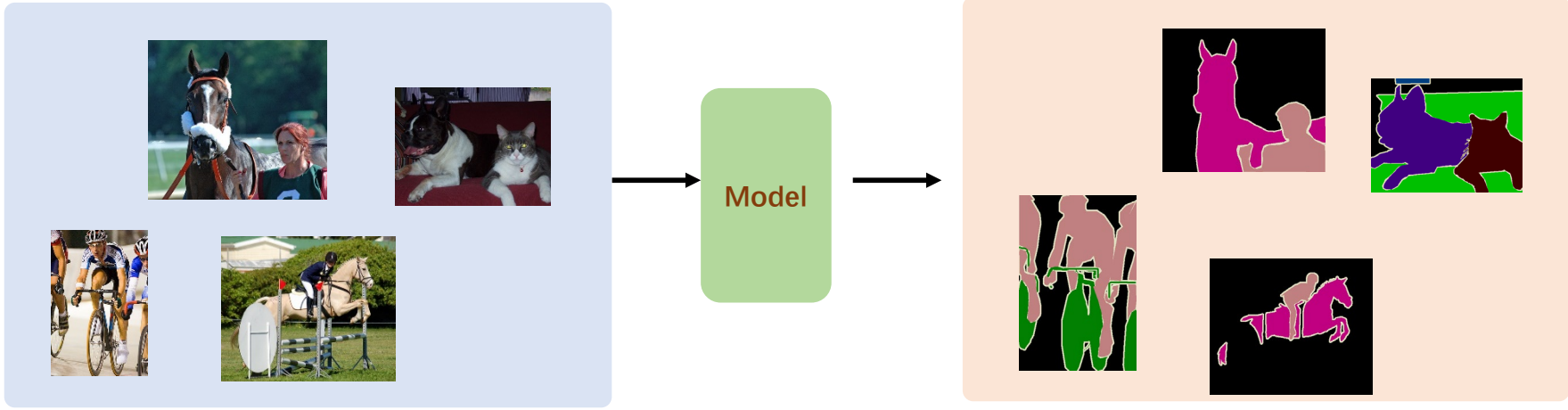
Weakly-Supervised Semantic Segmentation



Datasets consisting of images and corresponding coarse annotations

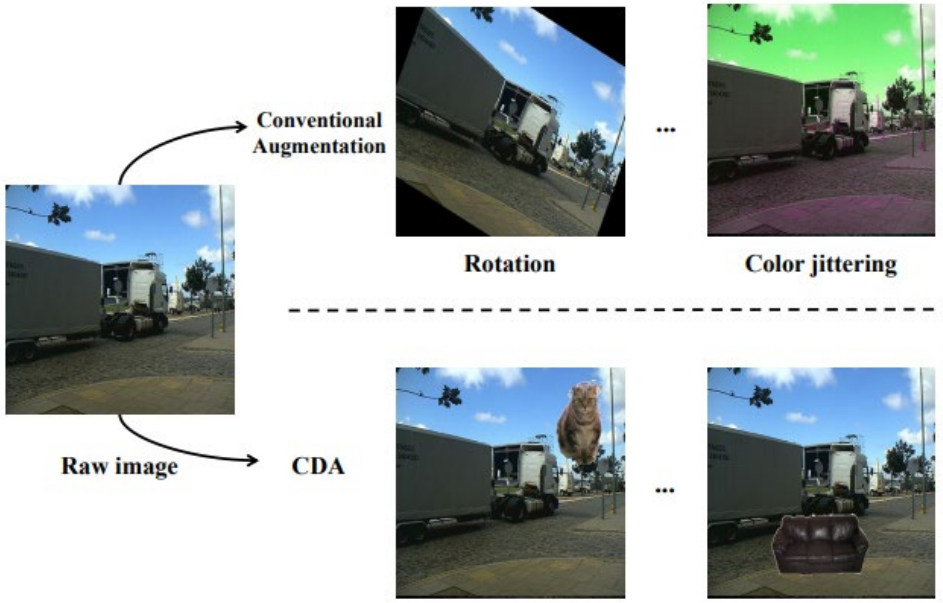
pixel-level labels of the datasets for training dense semantic task

Limitation of Current Methods

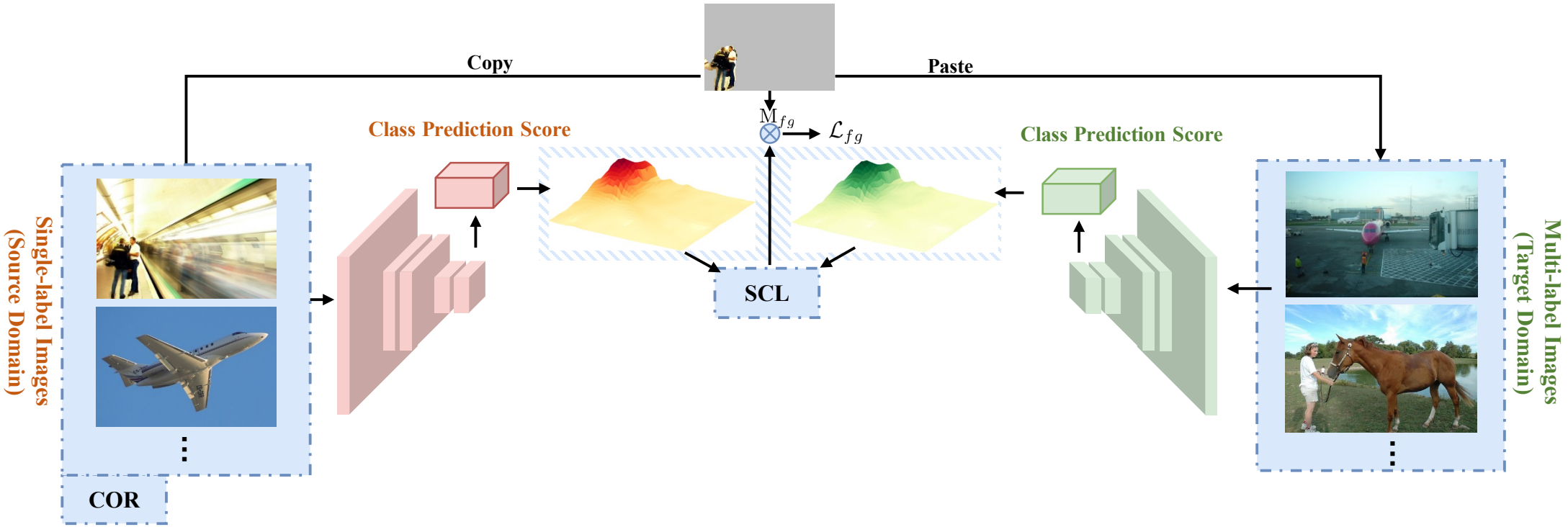
Obtaining precise pixel-wise labels remains challenging !

Semantic ambiguity

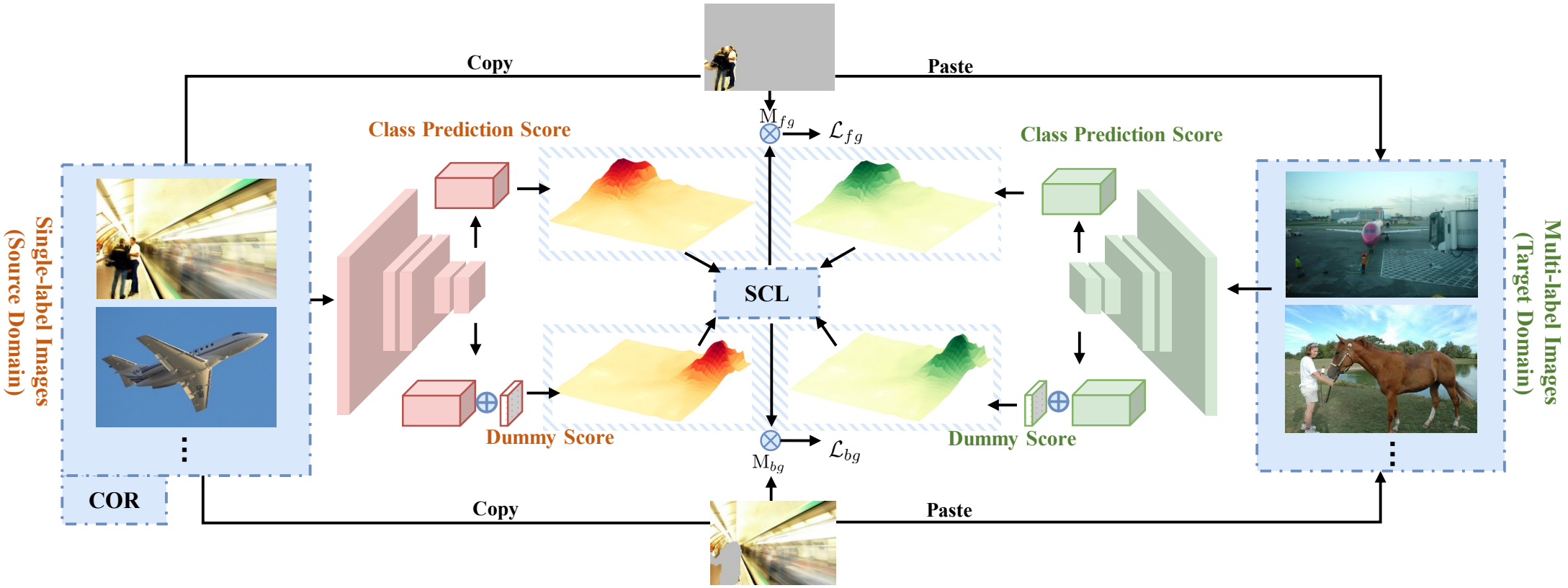
Previous work removes the dependence between target objects and contextual background by copy-and-paste augmentation, But still less efficient.



Cross-domain Semantic Decoupling for WSSS

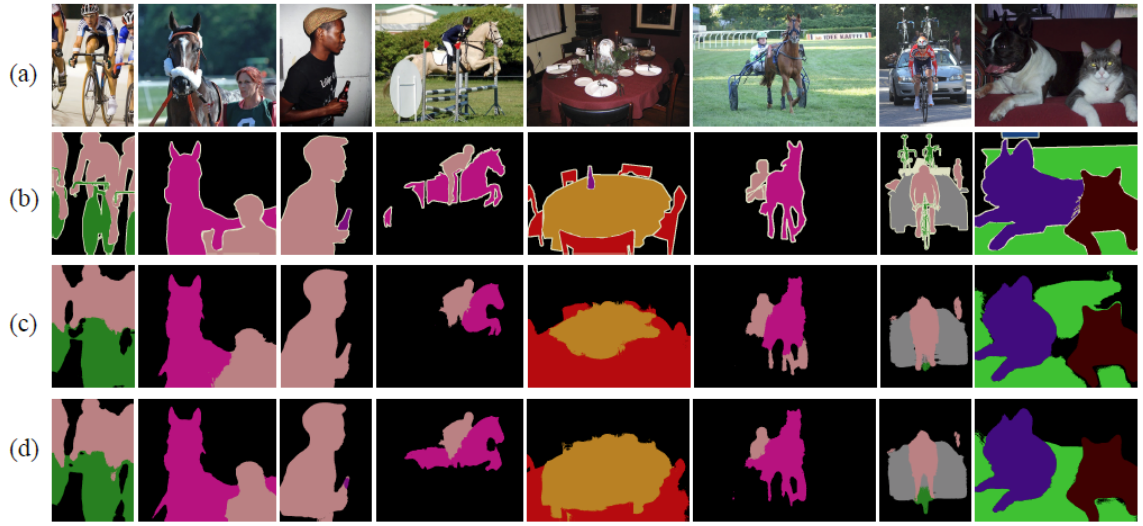


Cross-domain Semantic Decoupling for WSSS



Experiments

Method	Backbone	Seed	Mask	Val	Test
PSA [1] CVPR'2018	ResNet38	48.0	61.0	61.7	63.7
SEAM [25] CVPR'2020	ResNet38	55.4	63.6	64.5	65.7
CONTA [30] NeurIPS'2020	ResNet38	56.2	66.1	66.1	66.7
EDAM [26] CVPR'2021	ResNet101	52.8	68.1	70.9	70.6
AdvCAM [16] CVPR'2021	ResNet38	55.6	68.0	68.1	68.0
CDA [24] ICCV'2021	ResNet38	55.4	63.4	66.1	66.8
SIPE [5] CVPR'2022	ResNet101	58.6	69.3	68.8	69.7
CLIMS [27] CVPR'2022	ResNet101	56.6	70.5	70.4	70.0
ViT-PCM [22] ECCV'2022	ResNet101	63.6	67.1	70.3	70.9
Improvement over baseline:					
IRN [2] CVPR'2019	ResNet50	48.3	66.5	63.5	64.8
IRN **w/CSD** BMVC'2023	ResNet50	**50.6** ↑ 2.3	**68.2** ↑ 1.7	**64.9** ↑ 1.4	**66.1** ↑ 1.3 [1]
MCTformer [29] CVPR'2022	ResNet38	61.7	69.1	70.0	71.6
MCTformer **w/CSD** BMVC'2023	ResNet38	**63.8** ↑ 2.1	**70.9** ↑ 1.8	**71.4** ↑ 1.4	**72.8** ↑ 1.2 [2]



Extensive experiments on PASCAL-VOC 2012 and qualitative results demonstrate the validity of proposed CSD method.