

Domain Adaptation for Object Detection in target domain using weakly-supervised / self-supervised or semi-supervised settings

Computer Vision (CS6350)
TPA-1

1. Problem Statement

This problem introduces the task of domain adaptation in object detection using weakly-supervised or unsupervised data in the target domain. Given data from two different domains, the source domain and the target domain, the goal is to generalize well on the target domain data which is weakly labeled or completely unlabelled. The classes to be detected in the target domain are all or a subset of those in the source domain.

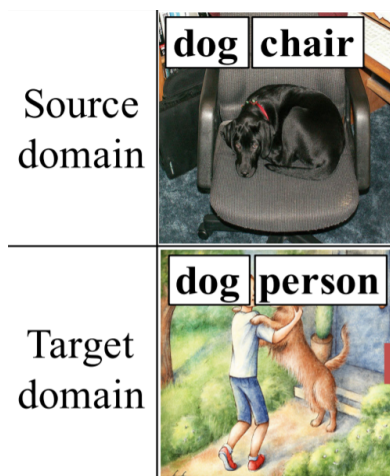
2. Input

- Images from source and target domain.
- Annotations for data in the source domain.
- Annotations for data in the target domain (in case of weakly labeled data only).

3. Expected Output

- 2D Bounding boxes for objects detected in the target domain.
- Quantitative performance evaluated on the target domain dataset using mAP metric.
- Qualitative Results on the target domain data.

A sample input output is shown below:



Source Domain: Image in daylight



Target Domain: Image at night

4. Datasets

- Cityscapes & Foggy Cityscapes
- PASCAL VOC & Clipart 1K

5. References

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4. Inoue, Naoto, et al. "Cross-domain weakly-supervised object detection through progressive domain adaptation." Proceedings of the IEEE conference on computer vision and pattern recognition. 2018.
5. Chen, Yuhua, et al. "Domain adaptive faster r-cnn for object detection in the wild." Proceedings of the IEEE conference on computer vision and pattern recognition. 2018.
6. Yao, Xingxu, et al. "Multi-source domain adaptation for object detection." *Proceedings of the IEEE/CVF International Conference on Computer Vision*. 2021.
7. Wu, Jiayi, et al. "Target-Relevant Knowledge Preservation for Multi-Source Domain Adaptive Object Detection." *Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition*. 2022.

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