Sliced Wasserstein Discrepancy for Unsupervised Domain Adaptation

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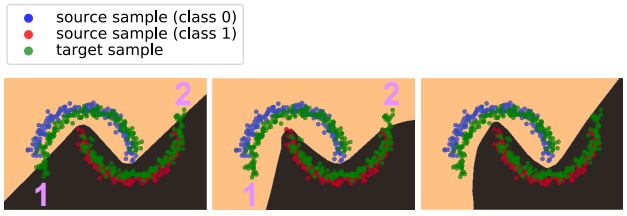
Supplementary Material

We perform a toy experiment on the inter twinning moons 2D dataset [1] to provide analysis on the learned decision boundaries as shown in Figure 1 below. For the source samples, we generate an upper moon (blue points) and a lower moon (red points), labeled 0 and 1, respectively. The target samples are generated from the same distribution as the source samples but with added domain shifts by rotation and translation. The model consists of a 3-layered fully-connected network for a feature generator and 3-layered fully-connected networks for classifiers.

After convergence, the source only model (Figure 1(a)) classifies the source samples perfectly but does not generalize well to the target samples in region 1 and region 2. The MCD approach (Figure 1(b)) is able to adapt its decision boundary correctly in region 1 but not in region 2. The proposed SWD method (Figure 1(c)) adapts to the target samples nicely and draws a correct decision boundary in all regions.



(a) Source only (b) MCD (c) SWD (ours)

Figure 1: Comparison of three decision boundaries on a toy example. Blue and red points indicate the source samples of class 0 and 1, respectively. Green points are the target samples generated from the same distribution as the source samples but with domain shifts by rotation and translation. The orange and black regions are classified as class 0 and 1, respectively, after convergence.

References

[1] Fabian Pedregosa, Gaël Varoquaux, Alexandre Gramfort, Vincent Michel, Bertrand Thirion, Olivier Grisel, Mathieu Blondel, Peter Prettenhofer, Ron Weiss, Vincent Dubourg, et al. Scikit-learn: Machine learning in python. *JMLR*, 2011.