Dynamic Classifier Alignment for Unsupervised Multi-Source Domain Adaptation

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Abstract: Unsupervised domain adaptation leverages the previously gained knowledge from a labeled source domain to tackle the task from a different but similar unlabeled target domain. Most existing methods focus on transferring knowledge from a single source domain, but the information from a single domain may be inadequate to complete the target task. Some previous studies have turned to multi-view representations to enrich the transferable information. However, they simply concatenate multi-view features, which may result in information redundancy. In this paper, we propose a dynamic classifier alignment (DCA) method for multi-source domain adaptation, which aligns classifiers driven from multi-view features via a sample-wise automatic way. As proposed, both the importance of each view and the contribution of each source domain are investigated. To determine the important degrees of multiple views, an importance learning function is built by generating an auxiliary classifier. To learn the source combination parameters, a domain discriminator is developed to estimate the probability of a sample belonging to multiple source domains. Meanwhile, a self-training strategy is proposed to enhance the cross-domain ability of source classifiers with the assistance of pseudo target labels. Experiments on real-world visual datasets show the superiority of the proposed DCA.

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