Improving Domain-Specific Classification by Collaborative Learning with Adaptation Networks

**ABSTRACT**

For unsupervised domain adaptation, the process of learning domain-invariant representations could be dominated by the labeled source data, such that the specific characteristics of the target domain may be ignored. In order to improve the performance in inferring target labels, we propose a target specific network which is capable of learning collaboratively with a domain adaptation network, instead of directly minimizing domain discrepancy. A clustering regularization is also utilized to improve the generalization capability of the target-specific network by forcing target data points to be close to accumulated class centers. As this network learns and specializes to the target domain, its performance in inferring target labels improves, which in turn facilitates the learning process of the adaptation network. Therefore, there is a mutually beneficial relationship between these two networks. We perform extensive experiments on multiple digit and object datasets, and the effectiveness and superiority of the proposed approach is presented and verified on multiple visual adaptation benchmarks, e.g., we improve the state-of-the-art on the task of MNIST→SVHN from 76.5% to 84.9% without specific augmentation.

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All are welcome!

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