Multi-source contribution learning for domain adaptation

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Abstract: Transfer learning becomes an attractive technology to tackle a task from a target domain by leveraging previously acquired knowledge from a similar domain (source domain). Different source domains contain different transferable information. Hence, the source contribution should be taken into account when predicting a target task. In this article, we propose a novel multi-source contribution learning method for domain adaptation (MSCLDA). As proposed, the similarities and diversities of domains are learned simultaneously by extracting multi-view features. Then multi-level distribution matching is employed to improve the transferability of latent features, aiming to reduce misclassification of boundary samples by maximizing discrepancy between different classes and minimizing discrepancy between the same classes. Concurrently, instead of averaging source predictions or weighting sources using normalized similarities, the original weights learned by normalizing similarities are adjusted using pseudo target labels to increase the disparities of weight values, which is desired to improve the performance of the final target predictor if the predictions of sources exist significant difference. Experiments on real-world visual data sets demonstrate the superiorities of our proposed method.

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