

## On a regularization of unsupervised domain adaptation in RKHS

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We analyze the use of the so-called general regularization scheme in the scenario of unsupervised domain adaptation under the covariate shift assumption. Learning algorithms arising from the above scheme are generalizations of importance weighted regularized least squares method, which up to now is among the most used approaches in the covariate shift setting. We explore a link between the considered domain adaptation scenario and estimation of Radon-Nikodym derivatives in reproducing kernel Hilbert spaces, where the general regularization scheme can also be employed and is a generalization of the kernelized unconstrained least-squares importance fitting. We estimate the convergence rates of the corresponding regularized learning algorithms and discuss how to resolve the issue with the tuning of their regularization parameters. The theoretical results are illustrated by numerical examples, one of which is based on real data collected for automatic stenosis detection in cervical arteries.

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