

*NOTAM*²: Nonparametric Bayes Multi-Task Multi-View Learning

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Abstract

Heterogeneous learning refers to addressing problems with multiple types of heterogeneity, e.g., task heterogeneity, view heterogeneity, etc. It finds abundant applications in cross-lingual document classification, cross-domain sentiment analysis, web image classification, etc. Traditional approaches handle different types of heterogeneity *separately* via multi-task learning, multi-view learning, etc. More recently, researchers start to *jointly* model different types of heterogeneity in order to improve the learning performance with limited training data. In this paper, we advance state-of-the-art in heterogeneous learning by jointly modeling task and view relatedness via nonparametric Bayes method. To be specific, we model task relatedness using normal penalty with sparse covariances to couple multiple tasks and view relatedness using matrix Dirichlet process. We also propose *NOTAM*² algorithm, which is based on an efficient Gibbs algorithm. Experimental results demonstrate the effectiveness of *NOTAM*².

KEYWORDS: Heterogeneous Learning; Multi-task Multi-view Learning; Matrix Dirichlet Process; Gibbs Sampler.