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Multinomial Dirichlet Gaussian Process Model for Classification of Multidimensional Data

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Abstract : We present probabilistic multinomial Dirichlet classification model for multidimensional data and Gaussian process priors. Here, we have considered an efficient computational method that can be used to obtain the approximate posteriors for latent variables and parameters needed to define the multiclass Gaussian process classification model. We first investigated the process of inducing a posterior distribution for various parameters and latent function by using the variational Bayesian approximations and important sampling method, and next we derived a predictive distribution of latent function needed to classify new samples. The proposed model is applied to classify the synthetic multivariate dataset in order to verify the performance of our model. Experiment result shows that our model is more accurate than the other approximation methods.

Keywords : multinomial dirichlet classification model, Gaussian process priors, variational Bayesian approximation, importance sampling, approximate posterior distribution, marginal likelihood evidence
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