An adaptive approximation for Gaussian wavelet kernel

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***Abstract*—Kernel machine plays a critical role in science community since temporal data become more important and popular with rapidly increasing big data analysis. A major problem for the machine is difficulty in constructing kernel function. We show that it is possible to adaptively estimate the parameters of Gaussian wavelet kernel in Laplace method. Our approach is constructed on an obvious fact that the gradient of the kernel with respect to a central variable of feature space becomes zero. It is remarkable that the complexity of our estimation method is O(*N*) for *N* data. In order to validate the performance of the proposed approach, we simulate two kernel regression models which exploit the proposed approach on real electricity load data from Korea power exchange and electricity consumption data from Ireland's Commission for Energy Regulation.**

***Keyword*—Gaussian wavelet kernel, adaptive inference, Laplace approximation, electricity load/consumption forecast.**

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