# Optimal bandwidth matrices in functional principal component analysis of density functions

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| Résumé en anglais | In order to explore and compare a finite number T of data sets by applying functional principal component analysis (FPCA) to the T associated probability density functions, we estimate these density functions by using the multivariate kernel method. The data set sizes being fixed, we study the behaviour of this FPCA under the assumption that all the bandwidth matrices used in the estimation of densities are proportional to a common parameter h and proportional to either the variance matrices or the identity matrix. In this context, we propose a selection criterion of the parameter h which depends only on the data and the FPCA method. Then, on simulated examples, we compare the quality of approximation of the FPCA when the bandwidth matrices are selected using either the previous criterion or two other classical bandwidth selection methods, that is, a plug-in or a cross-validation method. |
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## Liens

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