

Data driven estimation of the Laplace-Beltrami operator

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Time : May 20th, 2017 9:30AM

Approximations of Laplace-Beltrami operators on manifolds through graph Laplacians have become popular tools in data analysis and machine learning. These discretized operators usually depend on bandwidth parameters whose tuning remains a theoretical and practical problem. In this talk, we address this problem for the unnormalized graph Laplacian by establishing an oracle inequality that opens the door to a well-founded data-driven procedure for the bandwidth selection. Our approach relies on recent results by Lacour and Massart on the so-called Lepskis method. This is a joint work with Ilaria Giulini (Inria Saclay Universit Paris Diderot) and Bertrand Michel (Ecole Centrale de Nantes)