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Wolfgang Polonik- Topologically penalized regression on manifolds

Tuesday, October 4, 2022 10:00 AM (1 hour)

We study a regression problem on a compact manifold. In order to take advantage of the underlying geometry and topology of the data, we propose to perform the regression task on the basis of eigenfunctions of the Laplace-Beltrami operator of the manifold that are regularized with topological penalties. We will discuss the approach and the penalties, provide some supporting theory and illustrate the performance of the methodology on some data sets, illustrating the relevance of our approach in the case where the target function is “topologically smooth”. This is joint work with O. Hacquard, K. Balasubramanian, G. Blanchard and C. Levrard.