

DENSITY ESTIMATION ON MANIFOLDS

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Abstract: A guiding principle in high-dimensional learning is that the observed data live on a small-dimensional structure. One of the most straight-forward way to model such a structure is to assume that it is a submanifold of the Euclidean space. We aim at studying the problem of density estimation in this setting: first, in designing a statistical model that takes into account the regularities of both the supporting manifold and the underlying density; and second, in analysing the competitive effect between these regularity parameters in a minimax sense. We'll exhibit adaptive estimators that are minimax under mild smoothness conditions, and further investigate the situation when the support is one-dimensional, showing that, in this case, the regularity of the support plays no role at all.