

1056-41-1525

Lawrence Carin* (lcarin@ece.duke.edu), Electrical & Computer Engineering Department, Box 90291, Durham, NC 27708-0291. *Nonparametric Manifold Learning and Compressive Sensing*.

Nonparametric Bayesian methods are employed to constitute a mixture of low-rank Gaussians, for data that are of high dimension N but are constrained to reside in a low-dimensional subregion of \mathbb{R}^N . The number of mixture components and their rank are inferred automatically from the data. The resulting algorithm can be used for learning manifolds and for reconstructing signals from manifolds, based on compressive sensing (CS) projection measurements. The statistical CS inversion is performed analytically. We derive the required number of CS random measurements needed for successful reconstruction, based on easily computed quantities, drawing on block-sparsity properties. The proposed methodology is validated on several synthetic and real datasets. (Received September 22, 2009)