1163-46-522   **Palle E. T. Jorgensen**, **Sooran Kang** and **Myung-Sin Song*** (`msong@siue.edu`), Department of Mathematics & Statistics, Southern Illinois University Edwardsville, Edwardsville, IL 62026, and **Feng Tian**. *Data Dimension Reduction using Kernel Principal Component Analysis.*

In linear data case, Principal Component Analysis is used for data dimension reduction. In nonlinear data dimension reduction , kernel-Principal Component Analysis is used instead with manifold and feature space transforms. The results extend earlier work for probabilistic Karhunen-Loève transforms on compression of wavelet images which were algorithms for optimization, selection of efficient bases, or components, which serve to minimize entropy and error; and hence to improve digital representation of images, and hence of optimal storage, and transmission. Several new theorems for data-dimension reduction will be presented, and with the use of frames in Hilbert space, and a new Hilbert-Schmidt analysis, we identify when a choice of Gaussian kernel is optimal. (Received September 08, 2020)