

1106-47-2934

**Pando G. Georgiev\*** ([pando.georgiev@ucf.edu](mailto:pando.georgiev@ucf.edu)), Department of Mathematics, University of Central Florida, Orlando, FL 32816-1364. *Reproducing Kernel Banach Spaces and their Applications to Classification, Clustering and Big Data Problems.*

We present a generalization of the Lax-Milgram theorem and use it for defining a new class of Reproducing Kernel Banach Spaces. The substantial idea in the definition is to use also surjectivity-type theorems. Several applications are presented to: classification problems (a generalization of the support vector machine classifier, sparse proximal support vector machines), subspace clustering, and big data problems. A particular case of subspace clustering leads to signal separation problems based on sparsity assumptions of the source signals. Similarly, subspace clustering leads to sparse approximate representation of multivariate signals. Applications to non-linear dimensionality reduction, non-linear skeletons of data sets and non-linear signal separation are presented. (Received September 17, 2014)