**List of revisions**

1. The paper is copy edited by professional person.
2. Acronym FKM (for fuzzy k-means algorithm) is replaced by acronym FCM.
3. Figures 1,2 and 5 are removed.
4. References regarding fuzzy k-means algorithm are added:

Viattchenin, D.A. An Algorithm for Detecting the Principal Allotment among Fuzzy Clusters and its Application as a Technique of Reduction of Analyzed Features Space Dimensionality. *Journal of Information and Organizational Sciences*, 33(1), 205-217, 2009.

And

Bezdek, J.C. *Pattern Recognition with Fuzzy Objective Function Algorithms*. Plenum Press, New York, 1981.

1. Variables are checked for normality, but normality of observed variables is not obeyed. Nevertheless, normality of distribution is not mandatory is the case of our application. We do not use principal components for testing, but merely for transformation of variables to obtain representation in the lower dimensional space. This is confirmed by literature (R.A. Johnson, D.W. Wichern. Applied Multivariate Statistical Analysis, Second edition, Prantice Hall International, London, 1988, page341):

...”Their development does not require multivariate normal assumption. On the other hand, principal components derived for multivariate normal populations have useful interpretations in terms of constant density ellipsoids.”

In our paper we are not using interpretation as described above.

Motivation for applying projection on principal components and centroids of classes came from text mining where projection on principal components (which is equivalent to application of SVD decomposition) is known as Latent Semantic Indexing and is applied on term-documents matrix without checking for normality of representation of documents (which is not obeyed since representations of documents are sparse).