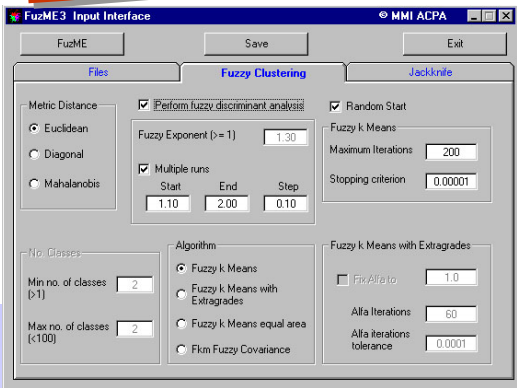
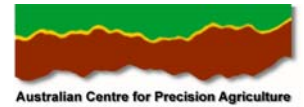




FuzME

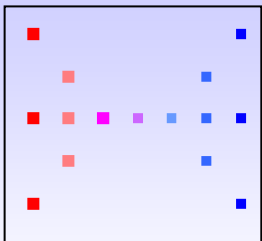
A computer program for fuzzy *k* means analysis

Budiman Minasny
Alex. McBratney

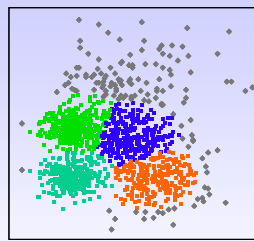


FuzME is a PC Windows-based program for general fuzzy classification. It has been used extensively worldwide for different purposes ranging from applications in soil science (classification of soil physical and chemical properties, attributes derived from digital elevation models, Landsat imagery, and delineating fields into management zones for precision agriculture) to identifying spatial dynamics of woodland caribou (Schaefer, 2001), classifying seasonal locations of grizzly bears, and road accidents.

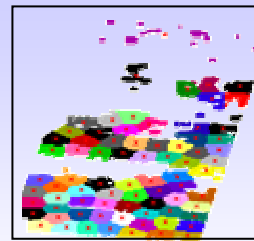
Features



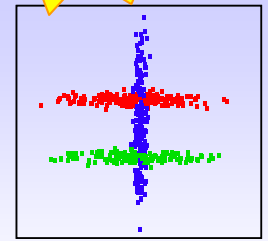
Fuzzy *k* means (fkm) (Bezdek, 1981)



fkm with extragrades (De Gruijter & McBratney, 1988)



fkm equal area (Minasny & McBratney, 1999)



fkm with fuzzy covariance Matrices (Gustafson & Kessel, 1979)

Fuzzy Discriminant Analysis

We have generalized the linear discriminant analysis as described by Webster and Oliver (1990) to a fuzzy linear discriminant analysis, which considers the membership of each individual to each of the classes. The program computes the sums of squares and products within- and between classes. This enables the calculation of a fuzzy Wilks' criterion, and projection of the data onto canonical axes.

FuzME is provided as freeware on the world-wide-web.

It can be downloaded at:
<http://www.usyd.edu.au/su/agric/acpa>

References:

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

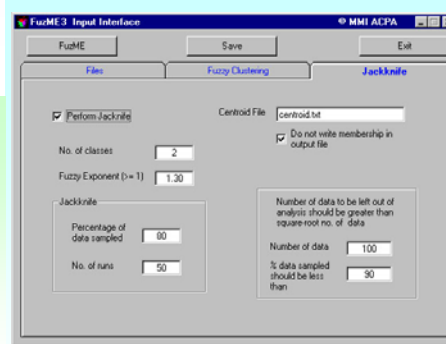
De Gruijter, J.J., McBratney, A.B., 1988. A modified fuzzy *k*-means for predictive classification. In: Bock, H.H.(ed) Classification and Related Methods of Data Analysis. pp. 97-104. Elsevier Science, Amsterdam.

Gustafson, D.E., Kessel, W., 1979. Fuzzy clustering with a fuzzy covariance matrix. Proc. IEEE-CDC 2, 761-766.

Minasny, B., McBratney, A.B., 1999. FuzME version 1.0. Australian Centre for Precision Agriculture, The University of Sydney.

Schaefer, J.A., Veltch, A.M., Harrington, F.H., Brown, W.K., Theberge, J.B., Luttich, S.N., 2001. Fuzzy structure and spatial dynamics of a declining woodland caribou population. *Oecologia* 126, 507-514.

Webster, R., Oliver, M.A., 1990. Statistical Methods in Soil and Land Resource Survey. Oxford University Press, Oxford.



Jackknife

Jackknife analysis samples a user-defined percentage of the whole data and perform fuzzy clustering. This procedure is repeated *n* times, and *n* series of class centroids are produced. The program returns the centroids of each run along with its statistics.

The FuzME web-page is ranked number one when searching for the keyword "Fuzzy k means" under the search engines Altavista™, Google™, Go.com, Hotbot®, msn® search, and Yahoo!®