

Development of a user-friendly software for forestry application of the k-nearest neighbour method

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Abstract: the work deals the presentation of a software designed for the applications of the k-Nearest Neighbour (k-NN) method for continuous estimates of biophysical attributes measured in the context of forest inventories or management plans. The software is designed to work together with the IDRISI system from which reads images data input. On the basis of a user-friendly interface, the software is simple to use, going ahead with the following steps: extraction of spectral features, optimization of the k-NN method, spazialization of the biophysical attributes. It allows the use of several k values and five different spectral distances: simple Euclidean distance, Mahalanobis, modified fuzzy Mahalanobis, local multiregressive, local not parametric multiregressive. Automathic stratification methods can also be used such as horizontal distances or vertical distances on the basis of Digital Elevation Models or other auxiliary data. A leave-one-out procedure is used to find the best configuration of the k-NN method. The software is developed within the framework of the activities of forestlab.net, a consortium of Laboratories of Forest Geomatics made of four Universities in Italy.