

عنوان مقاله:

Application of GA in Feature Optimization of Nearest Neighbor Classifiers

محل انتشار:

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خلاصه مقاله:

The design of a pattern classifier includes an attempt to select, among a set of possible features, a minimum subset of weakly correlated features that better discriminate the pattern classes. This is usually a difficult task in practice, normally requiring the application of heuristic knowledge about the specific problem domain. The selection and quality of the features representing each pattern have a considerable bearing on the success of subsequent pattern classification. Feature extraction is the process of deriving new features from the original features in order to reduce the cost of feature measurement, increase classifier efficiency, and allow higher classification accuracy. Many current feature extraction techniques involve linear transformations of the original pattern vectors to new vectors of lower dimensionality. While this is useful for data visualization and increasing classification efficiency, it does not necessarily reduce the number of features that must be measured since each new feature may be a linear combination of all of the features in the original pattern vector. In this paper a new approach is presented to feature extraction in which feature selection, feature extraction, and classifier training are performed simultaneously using a genetic algorithm. The genetic algorithm optimizes a vector of feature weights, which are used to scale the individual features in the original pattern vectors in either a linear or a nonlinear fashion.

کلمات کلیدی:

(feature reduction, genetic algorithm, pattern classification, nearest neighbor rule classifiers (k-NNR

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