ABSTRACT

This work presents a system for induction of fuzzy classifiers. Instead of the traditional fuzzy based rules, it was used a model called Fuzzy Pattern Trees (FPT), which is a hierarchical tree-based model, having as internal nodes, fuzzy logical operators and the leaves are composed of a combination of fuzzy terms with the input attributes. The classifier was obtained by creating a tree for each class, this tree will be a "logic class" description which allows the interpretation of the results. The learning method originally designed for FPT was replaced by Cartesian Genetic Programming in order to provide a better exploration of the search space. The FPT classifier was compared against Support Vector Machines, K Nearest Neighbour and Random Forests on several datasets from the UCI Machine Learning Repository and it presented competitive results. It was also compared with Fuzzy Pattern trees generated by the former learning method and presented comparable results with smaller trees and a lower number of functions evaluations.

Keywords: Machine Learning, Fuzzy Pattern Trees, Cartesian Genetic Programming, Classification, interpretability.