

1145-90-2491

**Nandini Rakala\*** (nrakala2015@my.fit.edu), 150 W. University Blvd., Melbourne, FL 32901, and **Munevver Mine Subasi** and **Ersoy Subasi**. *Logical Analysis of Data using Multi-Objective Optimization*.

We propose a multi-objective machine-learning model for a classification technique known as Logical Analysis of Data (LAD). LAD is a multi-step procedure consisting of discretization, support set selection, pattern generation, classification, and cross-validation. The key ingredient of two-class LAD method is the identification of patterns, distinguishing between pairwise disjoint subgroups of observations in a data-set. In this paper, we present a multi-objective pre-classification process of feature selection involving two conflicting goals of minimizing the number of features and maximizing the prediction accuracy, in a Pareto-based dominance form. We compare the accuracy and run-times of different classification techniques such as Decision Trees, Naive-Bayes, Nearest Neighbor, and SVM, on various data-sets and show how the proposed algorithmic approach outperforms the rest. The proposed approach identifies the set of strong/weak Pareto-optimal LAD patterns to predict the slow and rapid progressions of Chronic Kidney Disease patients in the African-American Study of Kidney Disease. (Received September 25, 2018)