

Euclidean space data projection classifier with cartesian genetic programming (CGP)

ABSTRACT

Most evolutionary based classifiers are built based on generated rules sets that categorize the data into respective classes. This research work is a preliminary work which proposes an evolutionary-based classifier using a simplified Cartesian Genetic Programming (CGP) evolutionary algorithm. Instead of using evolutionary generated rule sets, the CGP generates i) a reference coordinate ii) projection functions to project data into a new 3 Dimensional Euclidean space. Subsequently, a distance boundary function of the new projected data to the reference coordinates is applied to classify the data into their respective classes. The evolutionary algorithm is based on a simplified CGP Algorithm using a 1+4 evolutionary strategy. The data projection functions were evolved using CGP for 1000 generations before stopping to extract the best functions. The Classifier was tested using three PROBEN 1 benchmarking datasets which are the PIMA Indians diabetes dataset, Heart Disease dataset and Wisconsin Breast Cancer (WBC) Dataset based on 10 fold cross validation dataset partitioning. Testing results showed that data projection function generated competitive results classification rates: Cancer dataset (97.71%), PIMA Indians dataset (77.92%) and heart disease (85.86%).