ABSTRACT

People use various kinds of vehicle to travel from one place to another. One of those vehicles is car. Car is the favourite vehicle used by most of the people in the whole world. The manufacturers always produce large numbers of car with different models. Each brand produced in a certain year has amount of fuel consumption varies from each other, depends on the factors affected to its machine, such as cylinder, displacement, horse power, and acceleration. The car's weight affects too. Due to large numbers of cars on the street, the needs of fuel is also increased. These can trigger the fuel shortages. To decrease the fuel shortages risk, the fuel must be used efficiently, and in order that the fuel can be used as thrift as possible, it is necessary to do the prediction of fuel consumption. Besides, the fuel used as efficient as possible would spare the outcome.

In this final Task, the differential evolution algorithm is used to solve the non-series prediction problem to optimize weights of artificial neural network and determine the optimal ANN structure, in order to predict the car's fuel consumption in miles per gallon. However, it differs from the other EAs which the new individuals generating process are random, DE generates new individuals using spesific formula and semi-directional, so that the optimum solutions would be found more quickly. Tests applied to the parameters of DE and the number of hidden neurons. The accuracy calculations use normalized data and denormalized data.

Keywords : differential evolution, non-time series prediction, artificial neural network, miles per gallon.