عنوان مقاله:

Combining artificial neural network and genetic algorithm to predict and reduce fuel consumption and exhaust emissions of DI diesel engine

محل انتشار:

اولین کنفرانس رویکردهای نوین در نگهداشت انرژی (سال: 1390)

تعداد صفحات اصل مقاله: 8

نویسندگان:

majid bakhshi - *Urmia University, Department of Mechanical Engineering Urmia University*

shahram khalilarya - *Urmia University, Department of Mechanical Engineering Urmia University*

خلاصه مقاله:

Rising energy prices, shortage of energy resources and stringent environmental regulations have enforced the automotive companies to provide new methods to increase engine efficiency. This paper studies the combination of artificial neural network (ANN) and genetic algorithm (GA) to optimize the diesel engine operating parameters. The objective of the optimization was to find settings of engine that be able to reduce exhaust emissions while also maintaining, or even reducing the fuel consumption. In this paper the multi-layer back propagation algorithm with Levenberg-Marquardt training algorithm was used to predict and model the network -using experimental data of a sample engine -, receiving as inputs the engine operating parameters, and producing as outputs the emissions and fuel consumption. The ANN outputs were then used to evaluate the objective function of the optimization process which was performed with a GA approach. Obtained results showed sensible reductions in exhaust emissions and fuel consumption of engine.

کلمات کلیدی:

DI diesel engine, Brake specific fuel consumption, Emissions, ANN, GA