

A modified artificial neural network (ANN) algorithm to control shunt active power filter (SAPF) for current harmonics reduction

ABSTRACT

Proliferation of nonlinear loads /devices in power systems generates a major concern to power system engineers, courtesy of its severe contamination effects (polluting the distribution networks with current harmonics). This paper depicts artificial intelligence (AI) application on resolving the power quality problem mentioned above by using the parallel active power filter (APF) strategy in two-wire distribution systems. The proposed AI adopted is an artificial neural network (ANN) responsible to detect current harmonics for the active power filtering process. The novelty control design is an artificial neural network (ANN) adopting a modified mathematical algorithm (a modified delta rule weight-updating W-H) and a suitable alpha value (learning rate value) which determines the filters optimal operation. The proposed scheme is achieved via simulation studies (under MATLAB SIMULINK environment) and results obtained are discussed to verify its performance.

Keyword: Harmonic; Neural network; Shunt active power filter; Total harmonic distortion; Power