

CHARACTERIZING POWER QUALITY DISTURBANCES VIA WAVELET-NEURAL SCHEME

A. Elmitwally, A. Abdelmageid and S. Fathy
Electrical Engineering Department
Mansoura University
Mansoura 35516, Egypt
Phone (002) 050/2300779, Fax (002) 050/2224426
E-mail: kelmitwally@yahoo.co.uk

Keywords: power quality, disturbances, multi-resolution analysis, artificial neural network, characterization.

ABSTRACT

A voluminous amount of disturbance waveforms are captured and recorded by power quality survey projects. These disturbances need to be automatically classified and characterized to provide informative and useful results about the power quality condition of the system. Intensive research is conducted to accomplish efficient automatic classification tools. There is still a notable scarcity in apt techniques for characterization or quantification of disturbances. A scheme based on discrete wavelet transform and neural networks is proposed in this paper to characterize the recorded power quality disturbances. A routine is presented to compute the disturbance duration. A dedicated neural network is used to estimate the duration-magnitude product of the disturbance. The design and structure of neural estimator is addressed. An alternative scheme for designing the estimator is also proposed and described. The performance of the two methods is tested with many disturbances of 6 different types. The results are compared to select the best estimators relevant to each disturbance type.