

POWER QUALITY CLASSIFICATION USING STATISTICAL APPROACH

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ABSTRACT

This paper presents a power disturbance classification using statistical method simple clustering technique that is cluster data and a conventional partitioning method that is K-Means clustering. The key idea is to compare the clustered data between these two techniques. These two approaches have the same objectives i.e. to recognize similarities, clusters and classify the disturbance to one of the identified categories. The proposed method has the potential to evaluate various power quality disturbances, such as sag, swell and notches. It also evaluates the performance of each method and discusses the strength and weaknesses of both approaches based on the simulated results.

Keywords:

power quality, clustering, clusterdata, k-means.

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CHAPTER 1

INTRODUCTION

1.1 Introduction

In recent years, concerns over the quality of electric power have been rapidly increasing since poor electric power quality causes many problems to the supplied loads and for the supplying utilities, such as malfunctions, instabilities, reducing the life time of equipment and so on. Power disturbances can interrupt sensitive devices which may result in very expensive consequences.

Transient power quality deterioration includes transient disturbances within a cycle as well as rms Voltage swells and sags. These require continuous monitoring to capture the disturbance when it occurs. The measured value at any point is usually the effect of a single deforming device at some point in the network. Hence, one usually assigns a single source to this type of problem.

The steady state power quality deterioration includes phase unbalance, cyclic fluctuation of rms values (flicker) and harmonic distortion of waveform. Measurement of this type of quality deterioration at any point is reasonably independent of the time period of observation. This type of quality deterioration originates simultaneously at several points in a network.

To control power quality problems, standards have been established world wide identifying the various aspects of the subject and defining the acceptable limits of many of its known measures. Before taking any effective means to amend power quality problems, it is necessary to first analyse and assess them.