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EMPIRICAL MODE DECOMPOSITION WITH ANALYTIC SIGNAL FOR POWER-QUALITY ASSESSMENT

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Submitted by

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Certificate

This is to certify that the dissertation title **"Empirical Mode Decomposition with Analytic Signal for Power- Quality Assessment"** submitted by **Mr Amarendra Kumar Mishra**, Roll. No. *2K13/SPD/02*, in partial fulfilment for the award of degree of Master of Technology in Signal Processing & Digital Design at **Delhi Technological University, Delhi**, is a bonafide record of student's own work carried out by him under my supervision and guidance in the academic session 2014-15. To the best of my belief and knowledge the matter embodied in dissertation has not been submitted for the award of any other degree or certificate in this or any other university or institute.

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Table of Contents

Certificate ii

Acknowledgement iii

List of table vii

List of figure viii

Acronyms ix

Abstract x

Chapter-1 Introduction 1-2

1.1 Use of Power Quality 2

1.2 Literature Review 2

1.3 Thesis Organization 4

Chapter-2 Wavelet Transform 5-10

2.1 Continuous-Time Wavelet 5

2.2 Definition of Continuous Wavelet 5

2.3 Properties of Wavelet Transform 6

2.4 Continuous Wavelet Transform as a Correlation 6

2.5 Inverse Continuous wavelet Transform 7

2.6 Haar Wavelet 8

2.7 Morlet Wavelet 9

2.8 Application of Wavelet Transform 10

Chapter-3 Analytic Signal Using Hilbert Transform and Wavelet Transform 11-12

3.1 Hilbert Transform 11

3.2 Discrete Time Hilbert Transform 11

3.3 Application of Hilbert Transform 12

3.4 Analytic Signal Using Wavelet Transform 12

Chapter-4 Empirical Mode Decomposition Algorithm 16-18

4.1 Intrinsic Mode Function 17

4.2 Empirical Mode Decomposition 18

Chapter-5 Classification 19-22

5.1 Perspective on Classification 19

5.1.1 Statistical approaches 19

5.1.2 Machine Learning 19

5.1.3 Neural Network 20

5.2 Liner Discriminant Analysis 20

5.3 Different Approach to Linear Discriminant Analysis 21

5.4 K-NN Classifier 21

Chapter-6 Implementation and Results 23-27

Chapter-7 Conclusion and Future Work 28

REFERENCES

List of Tables

Table No.	Table Description	Refer Pg. No.
5.1	Classification Result for IMF-Hilbert Transform	26
5.2	Classification Result for IMF-Wavelet Transform	27

List of Figures

Figure No.	Figure Description	Refer Pg. No.
1.2.2	Morlet wavelet	10
5.4	Vector relation between x_1 and x_2	22
6.1	Sag signal	23
6.2	Swell signal	24
6.3	Harmonic signal	24
6.4	Transient signal	25

Abbrevations

EMD	Empirical Mode Decomposition
IMF	Intrinsic Mode function
PQ	Power Quality
DSP	Digital Signal Processing
FT	Fourier Transform
STFT	Short Time Fourier Transform
WT	Wavelet Transform
FFT	Fast Fourier Transform
IF	Instantaneous Frequency
HT	Hilbert Transform
DFT	Discrete Fourier Transform
DHT	Discrete Hilbert Transform
IDFT	Inverse Discrete Fourier Transform
SDA	Standard Deviation of Amplitude
SDP	Standard Deviation of Phase
PNN	Probabilistic Neural Network
ANN	Artificial Neural Network
ST	S-Transform
LDA	Linear Discriminant Analysis
KNN	K-Nearest neighbour
RBFNN	Radial Basis Function Neural network

Abstract

This thesis presents a wavelet transform method in combination with emprical mode decomposition (EMD) for power quality (PQ) events assesment. EMD is a time frequency analysis that decomposes the complex signals into several instrinsic mode functions(IMF). As the PQ events are nonstationary, instantaneous parameters have been extracted from these IMFs. We extracted three parameters from IMFs and then used KNN classifier for assesment of PQ disturbance. We compared the assesment of PQ events by extracting the features using Hilbert transform method.

A maximum classification accuracy of 97.25 % in both the cases (Wavelet transform method and Hilbert transform method).