Declaration

I hereby declare that the work presented in this Thesis titled *Wavelet-Alienation Based Protection Scheme for Transmission Systems,* submitted to the Indian Institute of Technology, Jodhpur in partial fulfilment of the requirements for the award of the degree of Doctor of Philosophy, is a bonafide record of the research work carried out under the supervision of Associate Professor Dr. Abdul Gafoor Shaik. The contents of this thesis in full or in parts, have not been submitted to, and will not be submitted by me to, any other Institute or University in India or abroad for the award of any degree or diploma.

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List of Abbreviations

Abbreviation	*Full form*
AB	Phase-A to Phase-B Fault
ABCG	Phase-A to Phase-B to Phase-C to ground Fault
ABG	Phase-A to Phase-B to ground Fault
AC	Phase-A to Phase-C Fault
ACG	Phase-A to Phase-C to ground Fault
AG	Phase-A to ground Fault
ANN	Artificial Neural Network
BC	Phase-B to Phase-C Fault
BCG	Phase-B to Phase-C to ground Fault
BG	Phase-B to ground Fault
CG	Phase-C to ground Fault
CT	Current Transformer
DAS	Data Acquisition System
DC	Direct Current
DSP	Digital signal Processing
DTR	Decision Tree
FACTS	Flexible Alternating Current Transmission
FC	Fault Classification
FD	Fault Detection
FDR	Fault Direction
FI	Fault Index
FIA	Fault Incidence Angle
FIS	Fuzzy Inference System
FSI	Fault Section Identification
FL	Fault Location
F-TH	Fault Threshold
G-FI	Ground Fault Index
GF-TH	Ground Fault Threshold
GPS	Global Positioning Satellite
HHT	Hilbert Huang Transform
HIF	High Impedance Fault
LG	Line to Ground Fault
LL	Line to Line Fault
LLG	Line to Line to Ground Fault
LLL/LLLG	Three-Phase Fault
PT	Potential Transformer
SSSC	Static Synchronous series Compensator
ST	Stockwell-Transform
STATCOM	Static Compensator
STFT	Short-Time Fourier Transform
SVM	Support Vector Machine
TCSC	Thyristor-Controlled Series Compensator
UPFC	Unified Power Flow Controller
VLSI	Very Large Scale Integration
WT	Wavelet Transform

List of Symbols

Symbol	*Description*
A	Alienation Coefficient
r	Correlation Coefficient
Z	Impedance
Y	Admittance
V	Voltage
I	Current
T	Time Period
w	Angular Frequency
ψ	Wavelet Function
φ	Scaling Function
W_ψ	Continuous Wavelet Transform
C_ψ	Admissibility Constant
s	Scale
τ	Location
Ψ (μ)	Fourier Transform