List of Figures

Figure	*Title*	*page*
2.1	Modelling process flow diagram of regressive based time series models	14
2.2	Modelling process flow diagram of machine learning based model	14
2.3	Neural network schematic diagram	17
2.4	Support vector machine classification	20
4.1	Time series analysis of data	31
4.2	Data series and its forecast result of FFNN	34
4.3	DWT decomposed series and its corresponding forecast using FFNN	35
4.4	Data series and its forecast using combination of DWT and FFNN	36
4.5	Data series and its forecast using FFNN, and hybrid of DWT and FFNN	37
5.1	Flowchart of the proposed methodology	40
5.2	STL decomposition to the time series of November 2015	41
5.3	Actual wavelet decomposed sub-series ($A(t)$, $d_1(t)$, $d_2(t)$, $d_3(t)$, $d_2(t)$, $d_5(t)$) and their corresponding predicted sub-series ($\hat{A}_(t), \hat{d}_1(t), \hat{d}_2(t), \hat{d}_3(t), \hat{d}_4(t), \hat{d}_5(t)$) of the November month	42
5.4	November data series and its forecast	43
5.5	Data series and its forecast in zoomed version	43
6.1	*$58\,kW$ grid-connected multicrystalline-silicon roof-top PV system*	49
6.2	*$43\,kW$ grid-connected amorphous-silicon thin-film roof-top PV system*	50
6.3	*Cracks developed in the PV system modules*	54
6.4	*Monthly Total Yield*	55
6.5	*Monthly specific yield*	55
6.6	*Monthly Performance ratios*	55
6.7	*Performance indicator based on $P_{ac,PTC}$*	55
6.8	*Monthly mean values of the solar irradiation, ambient temperature an module temperature*	56
6.9	*Year-wise energy produced by six inverters*	56
6.10	*Year-wise total yield in kWh*	56
6.11	*Monthly Total Yield*	57
6.12	*Monthly specific yield*	57
6.13	*Monthly Performance ratio*	57
6.14	*Performance indicator based on $P_{ac,STC}$*	58
6.15	*Monthly average values of the solar irradiation, ambient temperature and module temperature*	58
6.16	*Year-wise energy produced by six inverters*	59
6.17	*Year-wise total yield in kWh*	59