LITERATURE SURVEY

S. No	Title and Year	Objective	Advantages	Disadvantages
1	Predicting the Wind Turbine Power Generation based on Weather Conditions S Preethi, H Prithika, M Pramila, S Birundha 2021	It is quite difficult to estimate the wind power correctly despite the instabilities for a wind farm that converts the wind power to electrical energy. The climate at the location determines how much power a wind farm produces. In order to handle the challenges brought on by the changing weather conditions, a detailed forecast is necessary. In this paper, an end-to-end web application has been created to estimate and predict the energy production of wind turbines based on the weather. A special type of RNN called Bidirectional Long Short-Term Memory was used to create the prediction model (Recurrent Neural Network).	Unlike conventional procedure, the proposed model, that is currently running on the production server, would operate on the specific real-world data and provide users with predictions. The proposed method avoids this overfitting.	Only weather parameters have been considered in this application. By refining the model and incorporating it into the current application, other features like blade radius, can also be added
2	Forecasting of Wind Turbine Output Power Using Machine learning Haroon Rashid,	Wind energy is tied to variabilities of weather patterns, especially wind speed, which can be abnormal in climates with erratic weather conditions.	The proposed model in this study offers an efficient method to predict the output power	The problem of missing data exists. The prediction model can be developed by

	Waqar Haider, Canras Batunlu 2020	Here the author states that the output power of the wind turbines has been predicted using the random forest regressor algorithm wherein wind direction, wind speed and outdoor temperature are used as input parameters to predict output power. The model is tested for two different capacity factors. The estimated mean absolute errors for the proposed model in this study were 3.6% and 7.3% for and 0.2 capacity factors, respectively.	of a wind turbine with preferably low error. This model has a lot of advantages over other existing models in literature including low over-fitting tendency, simple and fast to train.	considering other parameters like fault in the wind turbine.
3	Modelling and Control Design for Variable Speed Wind Turbine Energy System R. Karthik, A. Sri Hari, Y. V. Pavan Kumar, D. John Pradeep 2020	Wind energy is one of the many known sustainable sources of energy. Hence it is necessary to obtain efficient results from it. Wind energy depends on various factors such as wind speed, blade area and air resistance. Since it is hard to control the damage to the load caused by fluctuations in the power generated, an efficient controller is needed. Here, multiple PID controller methods have been executed and the performance analysis obtained from the PID controllers are used to evaluate the metrics. It has been concluded that based	The proposed method for controlling variable speed of wind turbines is seen to have superior time domain performance results in terms of settling time and delay time. The tuning rules for the method used is simple and easy to understand	It is hard to design a model for controlling the turbines efficiently. It is difficult to design a controller that can be generalised to all systems and minimise the damage caused by uneven fluctuations in the generated power.

		on the simulations results and analysis on the time domain, it is clear that the usage of ZN-1 method is best suited for the control and design of wind turbine speed.		
4	Wind Power Forecasting using Artificial Intelligence Shahbaaz Ansari, T. G. Sampath Vinayak Kumar, Javed Dhillon 2021	Artificial Intelligence has been transforming the approach to predicting the power obtained from wind turbines. The author discusses the prediction of wind energy using Artificial Neural Networks and MATLAB software. Three different turbines having different rated powers and modelling have been considered and their characteristics have been documented. The turbines are located in plain terrain near the ocean. Hours of data have been obtained from online websites, especially for India. This has been run through a feed-forward neural network and results obtained can be used to predict the real-time power that can be generated in advance without the usage of any hardware.	The entire process from data collection to power prediction is completely via software. There is no need for any hardware equipment. The usage of neural networks results in accurate and reliable results.	The observation period takes time for the data to be collected.
5	Research on Wind Power Prediction Zhe Ren, Chengshuai Huang,	Here the author mentions two mathematical models that are constructed to predict wind power. One of them is designed	When the meteorological conditions are available, Auto regressive moving average	A better prediction can be done if available meteorological conditions have

	Meng Li 2019	for the condition of available numerical weather prediction information and the other one is an auto regressive moving average model based on the time-sequence change characteristics of wind power	model (ARMA) is built to forecast the wind power based on its time sequence characteristics. When the meteorological conditions are unavailable, a linear regression model is proposed to deal with weather data from different systems.	been dealt with by linear regression optimization
6	Short-Term Forecasting of Wind Turbine Power Generation Based on Genetic Neural Network Xin Weidong, Liu Yibing, Li Xingpei 2010	The author introduces genetic neural networks (NN) techniques for wind speed and power generation prediction of a wind turbine generator system. It also states about forecasting the wind power generation based on the standard power curve of the wind turbine generator system (WTGS). In order to speed up the coverage rate of the network and enhance predict precision, momentum BP algorithm and genetic algorithm are used respectively.	By using momentum BP and GA-BP, the convergence rate and prediction precision were improved due to GA (Genetic Algorithm) optimising weights and biases of the network.	The wind speed data is only from one wind farm and it does not consider the temperature, humidity, density, etc., which affect the wind speed

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