

Optimization of Vertical Axis Wind Turbine Based on Artificial Neural Network

Authors : Mohammed Affanuddin H. Siddique, Jayesh S. Shukla, Chetan B. Meshram

Abstract : The neural networks are one of the power tools of machine learning. After the invention of perceptron in early 1980's, the neural networks and its application have grown rapidly. Neural networks are a technique originally developed for pattern investigation. The structure of a neural network consists of neurons connected through synapse. Here, we have investigated the different algorithms and cost function reduction techniques for optimization of vertical axis wind turbine (VAWT) rotor blades. The aerodynamic force coefficients corresponding to the airfoils are stored in a database along with the airfoil coordinates. A forward propagation neural network is created with the input as aerodynamic coefficients and output as the airfoil co-ordinates. In the proposed algorithm, the hidden layer is incorporated into cost function having linear and non-linear error terms. In this article, it is observed that the ANNs (Artificial Neural Network) can be used for the VAWT's optimization.

Keywords : VAWT, ANN, optimization, inverse design

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