

# Using Neural Networks to Estimate Wind Turbine Power Generation

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**Abstract:** This paper uses data collected at Central and South West Services Fort Davis wind farm to develop a neural network based prediction of power produced by each turbine. The power generated by electric wind turbines changes rapidly because of the continuous fluctuation of wind speed and direction. It is important for the power industry to have the capability to perform this prediction for diagnostic purposes — lower-than-expected wind power may be an early indicator of a need for maintenance. In this paper, characteristics of wind power generation are first evaluated in order to establish the relative importance for the neural network. A four input neural network is developed and its performance is shown to be superior to the single parameter traditional model approach.

**Keywords:** neural network, estimation, wind power generation