Abstract

In this paper, a wind prediction system for the wind power generation using ensemble of multiple complex extreme learning machines (C-ELM) is proposed. The extreme learning machines is a single layer feed forward neural network having a fast learning and better generalization ability than the gradient-based learning methods. C-ELM is chosen as base classifier because it is very suitable for processing of non-linear data. For using the wind data in complex domain the wind speed and direction are represented as a complex number. This paper uses the elegant theory of conformal mapping to find better transformations in the complex domain for enhancing its prediction capability. Finally, to improve the generalization ability of the prediction system and to reduce the error encountered in single model predictors, an ensemble of multiple C-ELMS is used. The individual CELM model in the ensemble has different activation functions of the hidden layer neuron. Performance analysis proves that the predictions generated through our method are effective when compared to other complex valued neural network prediction systems.
References


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Index Terms

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Keywords

Classification; Complex-Valued Neural Networks; Extreme Learning Machine