

Short-term wind speed prediction based on robust Kalman filtering: an experimental comparison

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Abstract-

The use of wind energy for power electric systems attempts to reduce the dependence on fuel-based energy. With the aim of generating electrical power based on wind energy, it becomes necessary to model and predict wind speed. Wind speed observations are packed with outliers what makes it difficult to propose accurate predictors. This paper presents an experimental comparison of three different methods for making a Kalman filter robust to outliers in the context of one-step-ahead wind speed prediction. Two wind speed databases were used to test the predictive performance of the algorithms. The performance for all the methods is measured in terms of skewness and kurtosis for the predicted signal. The algorithms discussed worked efficiently in a sequential approach, and outperformed the standard Kalman filter.

Index Terms- Outliers; Robust Kalman filtering; Wind speed prediction; Wind power generation

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