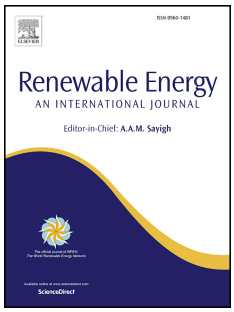
Accepted Manuscript



Wind turbine power curve modeling based on Gaussian Processes and Artificial Neural Networks

Bartolomé Manobel, Frank Sehnke, Juan A. Lazzús, Ignacio Salfate, Martin Felder, Sonia Montecinos

PII: S0960-1481(18)30225-8

DOI: 10.1016/j.renene.2018.02.081

Reference: RENE 9812

To appear in: *Renewable Energy*

Received Date: 29 March 2017

Revised Date: 3 December 2017

Accepted Date: 17 February 2018

Please cite this article as: Manobel Bartolomé, Sehnke F, Lazzús JA, Salfate I, Felder M, Montecinos S, Wind turbine power curve modeling based on Gaussian Processes and Artificial Neural Networks, *Renewable Energy* (2018), doi: 10.1016/j.renene.2018.02.081.

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

ACCEPTED MANUSCRIPT

Wind Turbine Power Curve Modeling based on Gaussian Processes and Artificial Neural Networks

Bartolomé Manobel[a,*], Frank Sehnke[b], Juan A. Lazzús[a], Ignacio Salfate[a], Martin Felder[b], Sonia Montecinos[a]

[a] *Departament of Physics and Astronomy, Universidad de La Serena, Casilla 554, La Serena, Chile*
[b] *Zentrum fur Sonnenenergie- und Wasserstoff-Forschung Baden Württemberg (ZSW). Stuttgart, Germany*

Abstract

An accurate estimation of the wind turbine power curve is a key issue to the provision of the electricity that the wind farm will transfer to the grid and for a correct evaluation of the performance of each turbine. Artificial Neural Networks (ANN) have proven to be well suited for solving this problem.

We propose in this study that including a prior automatic filtering, by means of Gaussian Processes modelling, improves the network performance significantly, and saves substantial time and resources. The aim of this paper is to present a complete method based on Gaussian Processes data pre-filtering and ANN modeling of wind turbine power curves. Results show that this procedure improves the standard ANN modeling and also improves on the widely used IEC-61400 standard (International Electro technical Commission) and other parametric and non-parametric methods.

*I am corresponding author
Email addresses: bmanobel@userena.cl (Bartolomé Manobel), frank.sehnke@zsw-bw.de (Frank Sehnke), jlazzus@dfuls.cl (Juan A. Lazzús), isalfate@dfuls.cl (Ignacio Salfate), martin.felder@zsw-bw.de (Martin Felder), smontecinos@userena.cl (Sonia Montecinos)

Download English Version:

https://daneshyari.com/en/article/6764488

Download Persian Version:

https://daneshyari.com/article/6764488

Daneshyari.com