View Reviews

Paper ID
79

Paper Title
Estimating high-resolution profiles of wind speeds from a global reanalysis dataset using TabNet

Track Name
Full Paper

Reviewer #1

Questions

1. Summary: In this section please explain in your own words what problem the paper addresses and what it contributes to solving it.
The paper presented a proof-of-concept method to estimate the wind profile using deep learning, TabNet, which has the potential for wind energy for climate mitigation. The paper shows the utility of deep learning for wind profile estimation with relatively good generalizability which is important for applications.

3. Relevance and Impact: Is this paper a significant contribution to interdisciplinary climate informatics?
The paper demonstrates the value of deep learning for climate mitigation applications and addresses the gap in existing methods for estimating wind speed for the renewable energy industry.

5. Detailed Comments
The paper is overall well written with clear description of methods and well designed experiments. It is among the top application papers/submissions that I have reviewed in this year's conference. The results are carefully analyzed and presented to demonstrate the strength and limitations of the proof-of-concept model.

To help improve the paper, I have a few minor comments:

1. For the input variables, I suggest the authors to provide the explanation of variables used as the input for the model if space allow.

2. In equation 3, please define variable "x".

3. Although the target of the model is to estimate the coefficients that can use for the approximation for the profile. Thus, Figure 3 show the comparison between the estimated and reference coefficients. However, it will also be valuable to show the comparison between the performance of the estimated wind profile and the reference wind profile with quantitative metrics in a more comprehensive way than selected examples in Figure 4 and 5.

4. Currently, authors used ~30 variables from ERA-5 to estimate the coefficients. Are all those variables necessary? From the variable importance, the answer seems to be no. Maybe the authors should consider variable selection before feed them as input features which may improve the model explainability and reduce the sensitivity of the model to errors in the input features (eg. Figure 5).