

Thank you for the opportunity to review this paper. Please find my suggestion for improving the manuscript below.

General Comments:

- The abstract could be improved by stating more clearly the methodology followed and also giving a summary of the achieved main results and model accuracies.
- It should be made clear from the beginning that this is a simulation-based study, maybe by changing the wording from “experimental data” to simulation data.
- Since you introduce previous work and other studies on blade misalignment detection, your discussion section would benefit from putting your results in relation to prediction accuracies of other studies and modeling approaches.
- You mention that the methodology requires a minimal set of sensors, typically available in WT systems. As I understand your methodology relies on the x,y,z blade root bending moments. Can you comment on the availability of these sensors in real wind fleets and their reliability? How would issues like sensor drift affect your methodology?

Specific Comments:

Line 25: The differentiation between machine-learning and model-based methods is a bit confusing as machine-learning models can also be used to compare expected vs. actual turbine behavior. Consider differentiating between first principle models and machine learning models.

Line 37: Do you mean the models tend to be tailored to a specific turbine? Please clarify.

Line 55: What signals would that be? Naming them would make it easier to understand the difference in your approach.

Line 57: I suggest changing to third person perspective:

In (Milani et al., 2024), the potential of machine-learning methods for detecting pitch misalignment was recognized....

Line 63: Why is interpretability an issue if the method can “detect and locate misalignments, even in turbulent conditions, with satisfactory performance.”?

Line 69: Naming the signals you use would improve clarity.

Line 145: This is the first time cp-lambda is mentioned. Introduce the tool in the beginning of the paragraph.

Paragraph 2.2: I think this paragraph lacks clarity. It should give a clear overview of the data simulation data set, including relevant input parameters and signals used for further analysis. The differentiation between “data sets” and “cases” is unclear. Also, the details on regression and classification analysis are not introduced yet and, therefore, difficult to understand.

Line 163: Spectral analysis?

Figure 2+3: Clearly state what can be seen in the upper and lower plot. Where is the 0.2 Hz peak? Is the unit on the y-axis correct?

Line 235: Have you chosen a smaller window than in the initial study? Please clarify.

Paragraph 3/ Figure 5: It is stated that both layers rely on random forest and regression models. Please clarify what each model in the different layers does. Also, the text could be better aligned with what is shown in the figure. What is “Strategy” referring to?

A more detailed explanation of the nature and functioning of the models would be beneficial. What kind of regression model is used, how is it tuned, etc?

Line 251: Restructure the sentence

Line 253: Do you use the same classification as in the previous study in the present study? Please clarify

3.1.1/3.1.2 Are these two separate approaches, or are they both used simultaneously? Please clarify also concerning Figure 5.

Line 284: Was a hyperparameter tuning process involved, or were hyperparameters selected based on the authors' experience?

Figure 7: Are the yellow points representing the reference value? Add to legend.

Figure 8: In line 296, you mention measuring the accuracy of the regression model in RMSEN, but here, absolute values are shown. Would it make sense to show RMSEN box plots?

Figure 9: Caption and text; please explain what can be seen in the subplots.

Figure 10: not mentioned in the text.

