

Wind Farm Noise Amplitude Modulation Detection

Random Forest based approach to audio features



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... and Amplitude Modulation detection: "many heads are better than one" ¹

Amplitude modulation (AM) is a characteristic signature of wind farm noise. This phenomenon is of research interest because it causes annoyance and potential sleep disturbance²⁻⁴.

Methods

Here we used the Random Forest classification algorithm¹ to detect AM. We validated the proposed method using an expert-scored dataset, and we compared the method's performance with previously published AM detection methods.

Results

Compared to traditional detection methods⁵⁻⁷, the proposed classifier consistently demonstrates superior performance, as measured using several validation strategies and different metrics. Also, the performance of the classifier is close to human performance. We find that traditional detection methods underestimate the prevalence of AM.

Conclusions

Taken together, our findings suggest an improved approach for detecting AM, leading to an increased understanding of AM characteristics, which is an important step towards improving the acceptability of future wind farms. ■

Acknowledgement

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References

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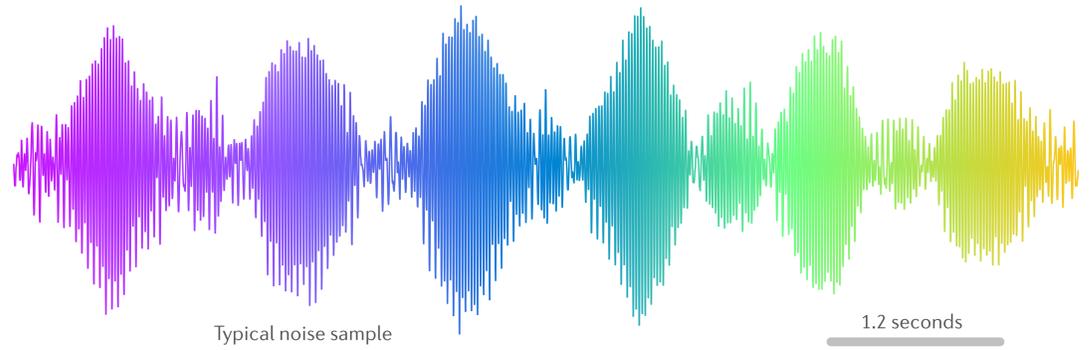
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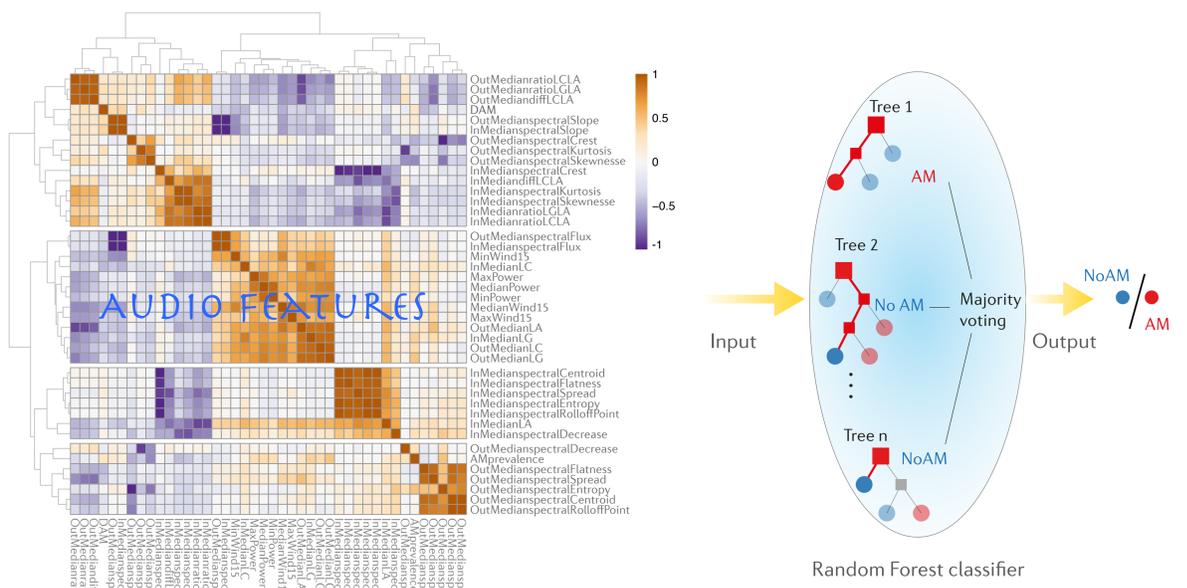
Duc Phuc Nguyen is currently a first year PhD student at Flinders University, Australia. He was the recipient of the prestigious Chancellor's letter of commendation during his Master's degree at Flinders University.

His research work involves quantification and characterisation of wind farm noise based on long-term measurements of acoustical and meteorological data. The results of his study are expected to fill the current gap in knowledge related to the quantification of wind farm noise characteristics and their prevalence, which is expected to improve quality of life for residents living near wind farms and to encourage sustainable development.

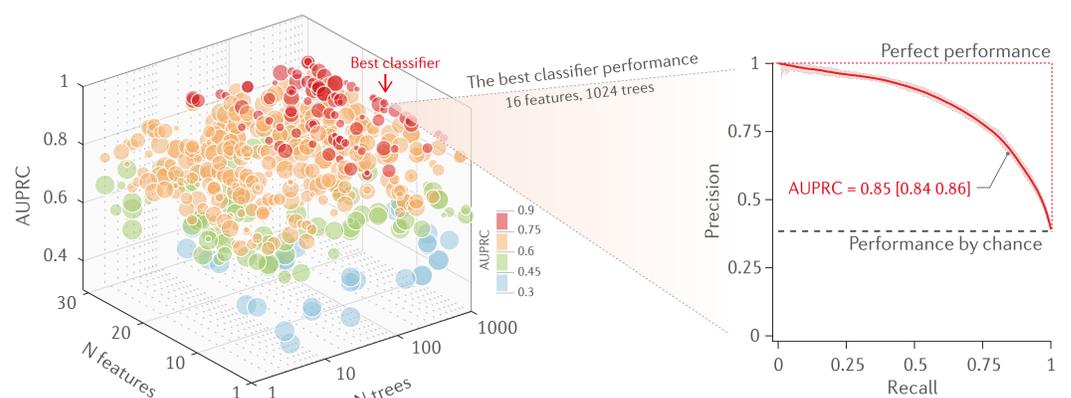
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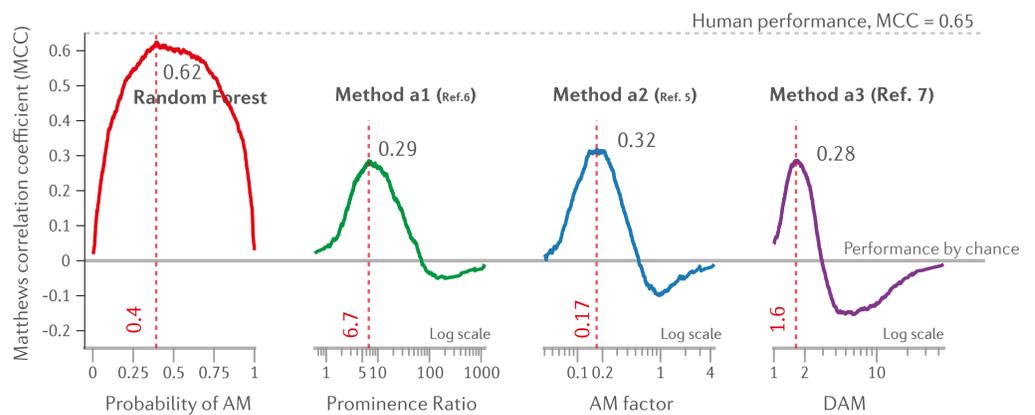
Audio Feature Extraction > Random Forest Classifier



Model Tuning > Model Validation



Performance evaluation



INSPIRING ACHIEVEMENT