

# Wind turbine gearbox failure prediction using condition monitoring data

S. Koukoura<sup>1</sup>, J. Carroll<sup>2</sup>, A. McDonald<sup>3</sup>

<sup>1</sup> University of Strathclyde, Glasgow, UK, [sofia.koukoura@strath.ac.uk](mailto:sofia.koukoura@strath.ac.uk)

<sup>1</sup> University of Strathclyde, Glasgow, UK, [j.carroll@strath.ac.uk](mailto:j.carroll@strath.ac.uk)

<sup>1</sup> University of Strathclyde, Glasgow, UK, [olasdair.mcdonald@strath.ac.uk](mailto:olasdair.mcdonald@strath.ac.uk)

## Abstract

The purpose of this project is to create a framework that utilises wind turbine condition monitoring data in order to predict incipient gearbox faults and therefore reduce operation and maintenance costs. Anomaly detection and pattern recognition techniques are used for health estimation and diagnosis of the system.

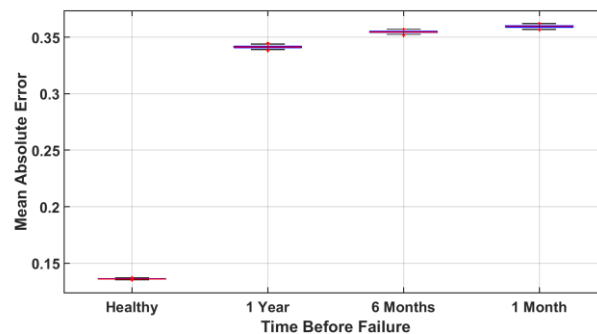


Figure 1: Mean absolute error of predicted gearbox temperature increasing towards failure.

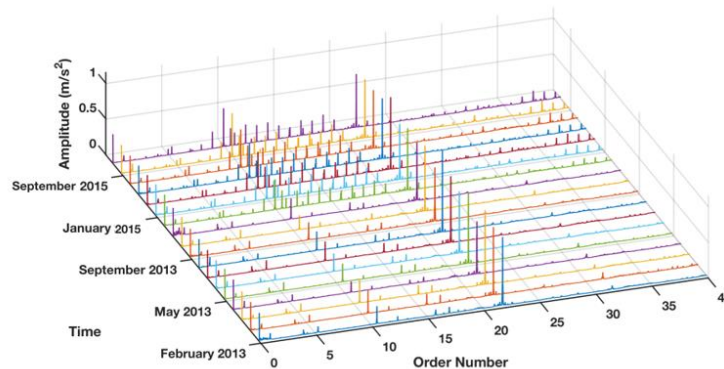


Figure 2: Spectra of vibration signals leading towards a gear failure.

## References

- [1] Zaher, A.S.A.E., McArthur, S.D.J., Infield, D.G. and Patel, Y., "Online wind turbine fault detection through automated SCADA data analysis". *Wind Energy: An International Journal for Progress and Applications in Wind Power Conversion Technology*, 2009, pp.574-593.
- [2] Koukoura, S., Carroll, J. and McDonald, A., "Wind turbine intelligent gear fault identification". *Annual Conference of the PHM Society*, 2017.