



# SEMINAR

APPLIED MATHEMATICS AND MECHANICS

FS1000

24 July 2024

A DCAMM seminar No. 778 will be presented by

**Senior lecturer, Dr. David Garcia Cava**  
**School of Engineering,**  
**University of Edinburgh, United Kingdom**

The title of the lecture is

## **Vibration data and underlying physics models for adaptive structural health monitoring**

### **Abstract:**

In the context of long-term monitoring applications, there are numerous structural states that exhibit similar behaviour but cannot be generalised with a single model (whether data- or physics-based) due to the inherent time-variant nature of structural evolution. Addressing such scenarios necessitates methodologies with adaptable models that can capture the interdependencies between Environmental and Operational Variabilities (EOV) and Damage Sensitivity Features (DSF) at various stages of structural evolution. The challenge lies in determining when distinct structures can be considered pseudo-similar, thereby sharing the same underlying physical properties to better represent the dynamics and associated EOV dependencies. Similarly, the incorporation of physics-based models, with varying levels of fidelity, adds knowledge towards understanding structural changes, which is essential for incorporating interpretable constraints on DSF evolution. In this seminar, I aim to share recent advances from the Dynamics, Vibration and Monitoring research group on two fronts: (i) the latest approaches for mitigating the effects of EOV through adaptive stochastic data modelling that evolves with the structural integrity, and (ii) the capabilities of incorporating underlying physics models of the dynamics of structural elements to inform real data through interpretable constraints and predictions on structural integrity evolution. The fundamentals of these approaches and their applications in the wind energy sector will be presented.

DATE: **Monday, 26 August 2024**

TIME: **10:00 – 10:45**

PLACE: **Benz Seminar Room, Ø31-605-2, Moseskovvej 67**  
SDU, University of Southern Denmark

The seminar will also be online – invitation for  
Teams meeting is in the mail

Cake, coffee and tea will be served 15 minutes before the seminar starts.

All interested persons are invited.

Jan Becker Høgsberg

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