



Contribution ID: 118

Type: **not specified**

Functional Data Analysis in Reliability and Maintenance Engineering: An Application to Aircraft Engines

Tuesday, 12 September 2023 15:15 (30 minutes)

In this work, a practical reliability analysis and engine health prognostic study is performed using a Functional Data Analysis (FDA) approach. Multi-sensor data collected from aircraft engines are processed in order to solve one of the most important reliability analysis problems, which is estimating the health condition and the Remaining Useful Life (RUL) of an aircraft engine. Time-variant sensor data is converted to smooth sensor curves in the form of functional data, and the Multivariate Functional Principal Component Analysis (MFPCA) approach is applied to predict the RUL and to develop a Predictive Maintenance (PdM) policy. The distribution of the principal component scores allowed us to understand sensor behavior and suggests a classification of different types of engines based on qualitative variables.

Keywords

Functional Data Analysis, Multivariate Functional Principal Component Analysis, Engine Prognostic

Classification

Both methodology and application

Primary authors: Mr YILDIRIM, Cevahir (UC3M); Dr FRANCO PEREIRA, Alba Maria (UCM); Prof. LILLO RODRIGUEZ, Rosa Elvira (UC3M)

Presenter: Mr YILDIRIM, Cevahir (UC3M)

Session Classification: INVITED Spanish: Reliability and New Type of Data

Track Classification: Reliability