



Contribution ID: 65

Type: **not specified**

Defining a design space of climate conditions for engineering design

Tuesday, June 28, 2022 12:10 PM (20 minutes)

Many industries produce products that are exposed to varying climate conditions. To ensure adequate robustness to climate, variation in the relevant features of climate must be quantified, and the design space of interest must be defined. This is challenging due to the complex structure of climate data, which contains many sources of variation, including geography, daily/seasonal/yearly time dynamics and complex dependencies between variables (such as the non-linear relationship between humidity, temperature and pressure). We consider the case of quantifying and summarizing climate conditions for the purpose of electronic product design, where temperature and humidity are known to impact reliability as in the case of corrosion. We develop a climate classification based on key features for this application, which can help design engineers to take geographical climate variation into account. Next, we consider different approaches for defining dynamic experiments from the climate conditions within each climate class. This problem cannot be solved with conventional DOE where experiments under static conditions are assumed. Besides the case of climate experiments, the proposed methods may be useful in any setting where dynamic experiments are required.

Keywords

climate classification, clustering, dynamic experiments

Primary authors: SPOONER, Max (Technical University of Denmark); KULAHCI, Murat (DTU)

Presenter: SPOONER, Max (Technical University of Denmark)

Session Classification: CONTRIBUTED Modelling 4

Track Classification: Design and analysis of experiments