Dr. Gabriel Michau from Stadler Service AG will talk about

« Whispering machines:

Deep Learning for viable Condition Based Maintenance*»*

It usually does not take much for an experienced operator to identify if a machine is running smoothly. Listening to the sound of a machine often tells her or him a lot already. With the constant drop in costs for data sensing, transmission, storage and processing, it is thus quite natural to monitor the airborne acoustic emissions of industrial assets.
One difficulty of dealing with such measurements in the industrial context is the conciliation between the high-frequency (HF) sampling and low-dimensional decision states (e.g. healthy/unhealthy), in a context where labels are very often not available.
In this presentation, I present a fully unsupervised deep-learning framework inspired by the wavelet decomposition that is able to extract meaningful and sparse representation of raw HF signals and that is also able to handle different lengths of time series flexibly. It thereby overcomes several of the limitations of existing deep-learning approaches. The framework, not requiring any pre-processing steps, allows for the handling of high-frequency signals in a fully automatic manner and is an important basis for future applications with HF data.

The Speaker: Dr. Gabriel Michau is leading the development of Data-Driven maintenance solutions at Stadler Service AG, piloting end-to-end data-driven projects, from identifying the sensing technology to the optimisation of the existing maintenance strategies. He specialised in the development of innovative deep learning algorithms for the processing of industrial data as Senior Scientist at the *ETH Zürich*, in the Chair of Intelligent Maintenance Systems. At the ZHAW, he worked on several innovation projects with industrial partners to develop machine learning solutions to specific problems met by the industries. Gabriel holds a joint PhD between the *Ecole Normale Supérieure de Lyon*, in Physics, specialised in convex optimisation and *the Queensland University of Technology* in Brisbane, in Traffic Engineering.