Maxime Leiber (Safran)
Title : Differentiable short-time Fourier transform.
Abstract : The short-time Fourier transform (STFT) is a powerful tool for analyzing non-stationary signals. However, finding the optimal parameters for the STFT, such as window and hop lengths, can be difficult and time-consuming. In this presentation, we propose a differentiable version of the STFT, called differentiable short-time Fourier transform (DSTFT), which makes these parameters continuous. DSTFT enables the use of gradient-based optimization methods, which are more computationally efficient than conventional discrete optimization techniques. It also offers improved control over the trade-off between temporal and frequency resolution, as well as the temporal positioning of windows. I will present two optimizations approaches for DSTFT, minimizing an error criterion on the representation and on the task performance, before presenting some experiments.

Dominique Fourer (IBISC, Evry University)
Title : Harmonic-Percussive Source separation based on local linear modulation estimators
Abstract : We introduce a new harmonic/percussive source separation (HPSS) method based on recently introduced local AM-FM estimators which were originally designed for synchrosqueezing techniques. Here, we show that these estimators can also be used to discriminate the harmonic part from the percussive part of a musical audio mixture. Our method blindly operates in the time-frequency plane and assigns each point to a source according to its local modulation rate that is expected to be higher for percussive sounds than for harmonic components. Our technique offers a simple and elegant mathematical formulation of the HPSS problem that can provide competitive results in comparison to state-of-the-art blind methods when comparatively evaluated on a music dataset.

Nils Laurent (GIPSA-Lab, Grenoble)
Title : A novel approach based on Vorono cells to classify spectrogram zeros of multicomponent signals
Abstract : I will present a method for the classification of spectrogram zeros (SZs) of multicomponent signals affected by a complex white Gaussian noise. This method relies on the energy distribution along the edges of Vorono Cells associated with the SZs (VSZs) in the case of pure noise. The VSZs are classified depending on the number of edges containing high energy, from which the SZs are associated with a type of interference caused by noise only, signal and noise or signal only. Then, the algorithm associated with this method is provided as well as an example of its application.