methods for solving nonlinear least squares problems. The poster includes two parts. The first part will give the idea of our methods and shows some convergent properties.The second part will show some preliminarily computational results to illustrate our methods.

T. van Waterschoot and M. Moonen
"Adaptive Feedback Cancellation for Audio signals: an Application of Prediction Error Identification with Cascaded Noise Models "

Adaptive feedback cancellation (AFC) using a prediction-error-method (PEM)-based approach is a promising solution to the acoustic feedback problem, yet existing algorithms are designed for speech applications only. We propose to replace the all-pole near-end signal model (which corresponds to the noise model from a PEM point of view) with a cascade of two near-end signal models: a tonal components model and a noise components model. The tonal components model can then be an all-pole model, a pole-zero model, a pitch prediction model, a frequency-warped all-pole model, or a selective all-pole model, while the noise components model is a conventional all-pole model. We derive the identifiability conditions for joint identification of the acoustic feedback path and the cascaded near-end signal models. Dépending on the model structure that is used for the near-end tonal components model, five different implementations of the proposed PEM-based AFC algorithm are considered. Simulation results for both room acoustic and hearind aid scenarios indicate a significant performance improvement in terms of the misadjustment and the maximum stable gain increase.

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P. M.M. Van Erdeghem, F. Logist, J. F. Van Impe
"Model based optimisation of tubular reactors for the production of LDPE"

This project involves the model-based optimisation and design of tubular reactors for the production of low-density polyethylene (LDPE). Information obtained from literature and industry results in detailed but complex mathematical models, which are not directly suited for optimisation purposes. Hence a two-step strategy is proposed. In a first step, a basic model which captures the most important phenomena is constructed based on advanced model reduction techniques. This basic model is used to identify the most promising optimisation possibilities.
In a second step, the optimisation is performed for different industrially relevant objectives. Depending on the objective, the reduced model will be further adjusted to the required level of detail.