System Identification with Maximum Length Sequences and Exponential Sweeps

Most system identification methods are described for linear time invariant systems. Audio engineers deal with weakly nonlinear systems which are nearly time invariant, such as amplifiers, speakers, concert halls, etc. In this talk some methods suitable for audio engineering purposes will be presented, describing their structure and properties:

· Period Impulse Excitation,
· Direct Frequency Method,
· 1- and 2-channel FFT,
· Maximum Length Sequence and
· Exponential Sweeps

will be compared to each other, emphasizing their advantages and disadvantages.

Additionally, a speed-up of the exponential sweep method identifying quasi-simultaneous multiple systems and an improvement of the signal-to-noise ratio using Gabor multiplier will be introduced.