

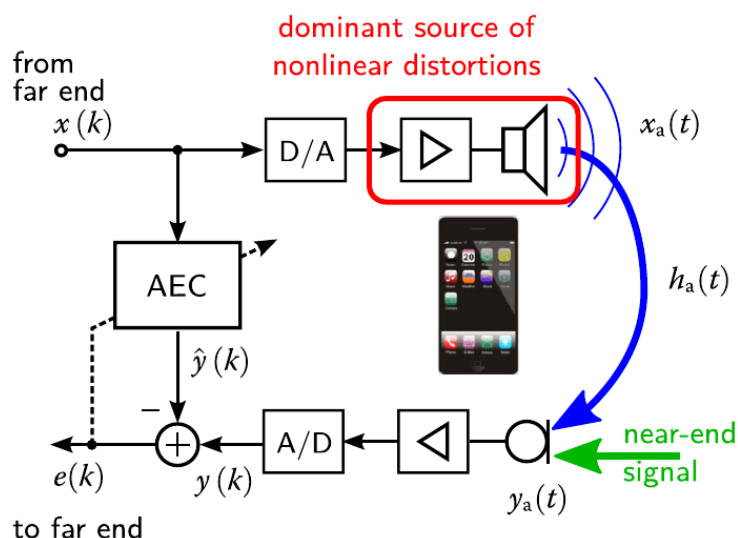
Master Thesis Proposal

Topic: Nonlinear Acoustic Echo Cancellation using Particle Filters

Description:

In a Loudspeaker-Enclosure-Microphone (LEM) system, nonlinear distortions caused by the loudspeaker pose a real challenge to acoustic echo cancellation algorithms. Due to the ubiquity of miniaturized loudspeakers in portable devices, this challenge has received growing attention over the past years, leading to the development of numerous models and algorithms. The problem of identifying the echo path, which includes both the linear and the nonlinear part of the system, becomes more interesting when the echo path under consideration is a time-varying one.

In this thesis, the performance of the significance-aware elitist particle filter based on evolutionary strategies (SA-EPFES) approach in tracking a time-varying echo path should be investigated. The possibility of a better behavior when using more sophisticated proposal densities -other than random walk- should be pursued and evaluated against related state-of-the-art methods. Implementation and evaluation are expected to be done in MATLAB.



[1] C. Hofmann *et al.*, "Significance-aware filtering for nonlinear acoustic echo cancellation", EURASIP, I-113, Nov. 2016.

Prerequisites: Course 'Digital Signal Processing', interest in stochastic modeling, Matlab experience.

Supervisor: M.Sc. MHD Modar Halimeh
(Cauerstr. 7, room 5.13, mhd.m.halimeh@fau.de)

Professor: Prof. Dr.-Ing. Walter Kellermann

Available: Immediately