Abstract

This thesis addresses the problem of blind identification for high speed wireless digital communication systems, they are always subject to intersymbol interference (ISI) caused by channel amplitude and phase distortions. In order to improve the capacity of the channel, blind Identification without the use of pilot sequences is used.

In this theses we investigate new results that address the identification of linear rational channels based on the use of second order cyclic statistics (SOCS). It is shown that channel identification is achievable for a class of linear channels without the need for a pilot tone or training periods. Moreover, channel identification based on cyclic statistics does not preclude Gaussian or near Gaussian inputs. SNR with Gaussian distribution was possible to handle.

We also investigate the identification of linear time-invariant (LTI) ARMA systems based on second order cyclic statistics using IIR filter. We present a parametric method. The parametric method we use directly identifies the zeros and poles of ARMA channels with a mixed phase.

Computer simulation illustrates the effectiveness of our methods in identifying ARMA system impulse responses, compared by the traditionally used CMA method.

We also investigated blind equalization using SOCS in order to peruse phase and speed the convergence.