Mitigating Inter-Symbol Interference using Blind Equalizer in a Wireless Communication System

Abstract

In modern world communication where multiple signal samples are transmitted at a time, a problematic phenomenon occurs called Inter symbol interference (ISI). In this phenomenon samples are affected by previous and next samples. This happens due to difference in the propagation delays over same path because of which symbols interact with each other at multiple points and over all signal is disturbed. Band limitation and multipath propagations are key issues of this phenomenon. Transmitted signal already contains white noise etc. The signal is affected by additive white noise as well. A suitable technique for reducing this ISI effect is adaptive method. Due to varying nature of noise detection, adaptive behavior of equalizer is necessary for effective mitigation. Adaptive algorithm requires a known training sequence to track time varying characteristics of the channel. Here the characteristics of channel are point of focus for the equalizers. Blind algorithms have a concept that they track time varying properties of channel as consequence of limitation in training sequence.

The paper deals with the designing of equalizers using different modulation techniques. Results
are applied over two wireless channels using three different wireless access techniques. The equalizer works as a blind equalizer since it treats the signals without any training pattern thus making this idea innovative. A comprehensive analysis based results are inferred to ensure the proper equalization model to reduce the ISI effect.

References

Mitigating Inter-Symbol Interference using Blind Equalizer in a Wireless Communication System


Index Terms

Computer Science Wireless

Keywords

ISI, Blind Equalization, QAM, Rayleigh, Rician, QPSK, Equalizers, CMA, MMA, SCA, BPSK, QPSK, Convergence