Abstract

MIMO is a technique to increase data rate significantly with multiple antennas at both the transmitter and receiver. MIMO takes the advantage of random fading and multipath delay spread. MIMO systems will need to function reliably in interference limited environment in order to be effective. CDMA systems are designed to operate in an interference free environment and for this reason it is used in modern cellular systems. The combination of MIMO and CDMA can further improve the system transmission rate over the traditional CDMA system. Multiuser MIMO CDMA systems are considered where each user has multiple transmit antennas, different transmit antennas of the same user use the same spreading code. Matched filter method and decorrelating detector method are used to detect the signals with Gaussian Noise. In many wireless systems the ambient noise is known through experimental measurements to be decidedly non-Gaussian due to largely impulsive phenomena. The performance of many multiuser detectors can degrade substantially in the presence of such impulsive ambient noise. For combating Multi Access Interference and impulsive noise in CDMA
communication systems, a technique based on m-estimation is used. Performance comparison shows that m-estimation has better performance under non-Gaussian noise than the other detection techniques.

Reference

- Shu-Ming Tseng, (2009)“ Sequential Detection for MIMO CDMA system with single spreading code per user” IEEE transaction on Wireless Communications, vol.8, No.7.
- Nazh Guney, Hakan Delic, and Mutlu Koca, “Robust Multiuser detection for Impulse Radio in Non-Gaussian UWB Channels”, wireless communication Laboratory, Dept of EEE, Bogazici University, Turkey.
- M. K. Simon and M. S. Alouini, Digital Communications Over Fading Channels: A Unified
Multiuser Detection for MIMO CDMA Systems


Index Terms

Computer Science Wireless Communication

Spreading Fading Noise

Linear Detection
Nonlinear Detection