MIMI-OFDM Wireless Link Simulations

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https://github.com/armaank/wi-comms

***Abstract*—We simulate a MIMO wireless link and implement a simple OFDM scheme based on the IEEE802.11a standard with several different types of equalization techniques. We then design a MIMO-OFDM system and conduct a performance analysis of the wireless link.**

***Index Terms*—MIMO, OFDM, MIMO-OFDM, IEEE802.11a, channel estimation, zero-forcing equalization, minimum mean-squared error equalization.**

I. Introduction

MIMO-OFDM is a technique used in large scale wireless systems. MIMO, multi-input mutli-output, in the context of communications, means that the system consists of multiple transmitters and multiple receivers. OFDM, orthogonal frequency division multiplexing, is a technique used to

II. MIMO Link

A. Channel Precoding

The first method for channel equalization is called

B. ZF Equalization

C. MMSE Equalization

D. Results

III. OFDM LINK

IV. 802.11a PHY Layer Overview

V. ZF Equalization

A. MMSE Equalization

B. Results

VI. Hybrid MIMO-OFDM System

A. Results

VII. Conclusion

We successfully simulated a MIMO wireless link and an OFDM scheme based on the IEEE802.11a PHY layer standard, experimenting with different methods for equalization and performance enhancement. We then implimented a hybrid MIMO-OFDM system and compared the performance of various equalization schemes.