NON PILOT AND PILOT AIDED
LEAST SQUARE CHANNEL ESTIMATION
ALGORITHM IN MIMO-OFDM SYSTEM

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ABSTRACT

Wireless communication is a developed technology and had been widely used nowadays, so the developments in digital communication are rapidly increasing to meet the ever increasing demand of higher data rates.In order to meet the high data rate, low complexity requirements of the future mobile communication systems, Multiple input Multiple output (MIMO) is introduced and integrated with Orthogonal Frequency division Multiplexing (OFDM) scheme to reduce Inter-Symbol Interference(ISI). With such integration, channel complexity is increased. Therefore several channel estimation techniques have been proposed to improve the estimation process and reduce the computational complexity by exploiting certain characteristics of the channel model.This project is about analyze and implement channel estimation techniques for MIMO-OFDM Systems with Least Squares (LS) Algorithm channel estimation by comparing non pilot and pilot aided result and the result is supposed the Pilot aided will have a better performance.

TABLE OF CONTENTS

CHAPTER 1

INTRODUCTION

1.1 INTRODUCTION

MIMO techniques which provides the potential for tremendous capacity increase. [1]. MIMO systems employ multiple antennas at both the transmitter and receiver.[2] The capacity grows linearly with the number of transmit and receive antenna pairs in spatial multiplexing MIMO systems if the channel can be estimated in the receiver and the channel paths are independent.[3].So by combining MIMO processing with OFDM is the key enabling technology for several current and future broadband wireless accessing systems. OFDM is most commonly applied in wireless communication systems because of the high rate of data transmission potential with efficiency for high bandwidth and its ability to combat against multi-path delay. It has been used in wireless standards especially for broadband multimedia wireless services.[4] Channel state information is required in MIMO-OFDM for space–time coding at the transmitter and signal detection at receiver. Its accuracy directly affects the overall performance of MIMO-OFDM systems.Therefore, channel estimation is an important task that is required in wireless communication systems.[1] Channel Estimation is the process of characterizing the effect of the physical medium on the input sequence. It is an important and necessary function for wireless systems. Even with a limited knowledge of the wireless channel properties, a receiver can gain insight into the data sent over by the transmitter.In many OFDM systems this concept can improve channel estimation signicantly, even if the channel statistics are not exactly known at a receiver.[4][8].In addition, In OFDM systems, channel estimation is usually carried out by employing pilot sequences. Typically, the pilot symbols in