



FINAL YEAR PROJECT REPORT

**SIMULATION OF MIMO DETECTORS IN MATLAB
AND IMPLEMENTATION OF A 2X2 DETECTOR
USING DSK 6713**

In fulfillment of the requirement
For degree of
BEE (Electronics)

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2012-2016**

ACKNOWLEDGEMENTS

We would like to thank everyone who had contributed to the successful completion of this project. We would like to express our gratitude to our research supervisor, Mr Muhammad Zuhair Arfeen and Dr. Murtaza Ali for their invaluable advice, guidance and their enormous patience throughout the development of the research. Apart from that we would like to specially thank Dr Haroon Rasheed for being supportive throughout and putting us in touch with different experts. We are also thankful to Sir Zaki Masood for his invaluable time and effort.

In addition, we would also like to express our gratitude to our loving parents and friends who had helped and given me encouragement.

SIMULATION OF MIMO DETECTORS IN MATLAB AND IMPLEMENTATION OF A 2X2 RECEIVER USING DSK 6713

ABSTRACT

Multiple input and Multiple output communication systems (MIMO) as the name implies makes use of multiple antennas at the transmitter and receiver and exploits the multipath fading in the channel which is generally considered to be an impairment for single input and single output (SISO) conventional communication channel due to various received multipath components. Which differ in angle of arrival, time delays or frequency (i.e. Doppler spread). As a result, the received signal fluctuates/fades in space, time and frequency through superposition of these multipath components which subsequently cause severe degradation of reliability and quality of received signal and impose constraints on high data rate for a communication system. MIMO technology addresses both the issues of problems caused by multipath fading in a conventional communication system as well as the constraints imposed by resource available through multiple antennas at the transmitter and receiver by exploiting the scattering in the environment to increase system capacity. Therefore in addition to time and frequency dimension ordinarily exploited by conventional communication systems, MIMO can also make use of spatial dimension. They are known to provide capacities many times that of the conventional Shannon limit and in principle can attain spectrum efficiencies in excess of tens of bits/sec/Hz especially. MIMO has been considered to provide a rather significant breakthrough with rewarding prospects to provide high data rate demands for the wireless industry and is ready to make its presence felt in standard driven industry products.

The Aim of the present project shall be to implement the MIMO Detectors. Data shall be transmitted and received through the MIMO communication chain that shall incorporate MIMO detection blocks.

We make use of the Spatial multiplexing scheme to Implement MIMO communication system. A thorough analysis of the MIMO Detectors like MMSE and ZF and Maximum likelihood detector and we carried out the MATLAB simulation of the BER performance versus SNR. Also implemented the maximum likelihood detector in C language

using DSK 6713, which shall ratify the diversity advantage and capacity gains theoretically perceived.

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