

SIMULATION OF FAST RECURSIVE LEAST SQUARE ALGORITHM FOR ECHO CANCELLATION SYSTEM

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ABSTRACT

There are numerous techniques utilized for echo cancellation. The current trend is using digital signal processing techniques. Currently, adaptive filtering methods are extensively used in echo cancellation. The performance of echo canceller depends on the choice of the adaptive filtering using Fast Recursive Least Square (FRLS) algorithm.

This thesis described the performance of Fast Recursive Least Square (FRLS) algorithm for transversal filter and recursive filter for echo cancellation system in a typical telephone network. The performance of FRLS algorithm for both filters is described and evaluated by using MATLAB software.. The results produced by the simulation process were analyzed in terms of convergence rate and complexity of the algorithm for echo cancellation system. It also looked how the number of taps and iteration influences the result of simulation.

The results indicated good agreement with theoretical result. It also proves that the algorithm can be used and capable for echo cancellation purpose.

TABLE OF CONTENTS

CHAPTER		PAGE
1	INTRODUCTION	
	1.1 Introduction	1
	1.2 Objective	2
	1.3 Scope of Work	2
	1.3.1 System Requirement	2
	1.3.2 Setting Limit	2
2	ECHO CANCELLATION SYSTEM	
	2.1 Echo Caused	5
	2.1.1 Impedance Mismatches	5
	2.1.2 Hybrid	5
	2.2 Types of Echo	6
	2.2.1 Electric / Hybrid Echo	6
	2.2.2 Acoustic Echo	7
	2.3 Adaptive Echo Cancellation	8
	2.3.1 PCM Channel With Echo Cancellation	8
	2.3.2 How Does Echo Canceller Work?	10
	2.4 Echo Cancellation in Network	14
	2.4.1 Wire Line / PSTN Long-Distance Network	14
3	FILTER	
	3.1 Adaptive Filtering	15
	3.2 Digital Filter	16
	3.2.1 Transversal Form of Digital Filter	17
	3.2.2 Recursive Form of Digital Filter	18

CHAPTER 1

INTRODUCTION

1.1 Introduction

Echo is inevitable in telephone. It is the delayed and possibly distorted the transmission signal, which the speech signal was reflected back to the speaker. For simple example, the echo of telephone network. It is an easily recognizable phenomenon when we make a telephone call. When we speak into the mouthpiece on a telephone set, we almost immediately hear our own voice from the earphone.

The echo canceller must accurately estimate the impulse response of the echo path, and rapidly adapt to its variations. The performance of the echo cancellers depends on the choice of adaptive filtering using Fast Recursive Least Square (FRLS) algorithm. The performance of various adaptive filtering algorithm can be analyze, observe and investigate the feasibility of using them to echo cancellation by refer to simulation result.

Digital Signal processing (DSP) applications by using algorithm can be implement either on DSP processor or in software such as Matlab.