

HARDWARE IMPLEMENTATION OF FX-T RECURSIVE LEAST MEAN SQUARE ALGORITHM FOR EFFECTIVE NOISE CANCELLATION USING TMS 320C5X PROCESSOR

¹J. JEBASTINE & ²B. SHEELA RANI

¹Research Scholar, Sathyabama University, Tamil Nadu ,Chennai-600119

²Vice-Chancellor & Dean, PG Studies and Research, Sathyabama University, Tamil Nadu ,Chennai-600119

ABSTRACT

This paper proposes the model for Recursive Least Square (RLS) algorithm and Fast Transversal Recursive Least Square (FxT-RLS) Algorithm for effective noise cancellation in acoustics and speech signal processing. The designed model gives the results in a noise free signal as output for RLS and FxT-RLS Algorithm. The filter used here is adaptive filter and the algorithm used is Recursive Least Square algorithm and Fast Transversal Recursive Least Square Algorithm. A white Gaussian noise is given as a input to the block and the other given input is the original speech/voice signal. By varying the adaptive step size, signal to noise ratio are determined and compared for both the algorithms. Based on these results the optimum step size is found for noise free outputs and the best efficient algorithm is found. The FxT-RLS algorithm provides similar performance to the standard RLS algorithm while reducing the computational effort. This is accomplished by a combination of four transversal filters used in union. The FxT-RLS algorithm is found to be a suitable solution for adaptive filtering applications and hence chosen to implement in hardware. The C Code of FxT-RLS is written in Code Composer studio. The .out file from the Code composer studio is converted to .asc format and downloaded into the TMS320C5X processor. Thus hardware has been implemented for effective removal of noise in audio and speech processing and it can be widely used in Mobile and Radio communication.

KEYWORDS: RLS, FxT-RLS, Simulink Model, TMS320C5X Processor, Noise cancellation