

LBYEC4A – EK1

Signals, Spectra and Signal Processing Laboratory



Final Project Proposal

Comparison of Different Wavelet Performances in Audio Denoising

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PROJECT DESCRIPTION

Noise in audio signals is a typical issue that can influence or alter the nature of sound accounts and playback. Any unwanted signal that disrupts the intended audio signal, resulting in distortion or other undesirable effects, is referred to as noise. Noise is considered to be the main culprit of corruption and lessened accuracies and preciseness of audio signals. Engineers have made resolutions to remove noise from audio signals over the years. The main objective of this project is to create a MATLAB code that is capable of denoising audio signals via wavelet transform.

Signals possessing both high and low frequencies at the same time can be analyzed by the use of wavelet transform as it decomposes signals into various frequencies by breaking down a specific data into wavelets making the data easier to be analyzed later on. Since wavelet transform is already known to be capable of denoising audio signals, this project intends to test which specific wavelet family performs best in audio denoising; the comparison of their performances may include; a specific wavelet family or a combination of different wavelet families applied to the signal.

METHODOLOGY

Requirements;

- 1) A clear audio signal
- 2) MATLAB software
- 3) Toolboxes to be Installed (Wavelet Toolbox etc.)

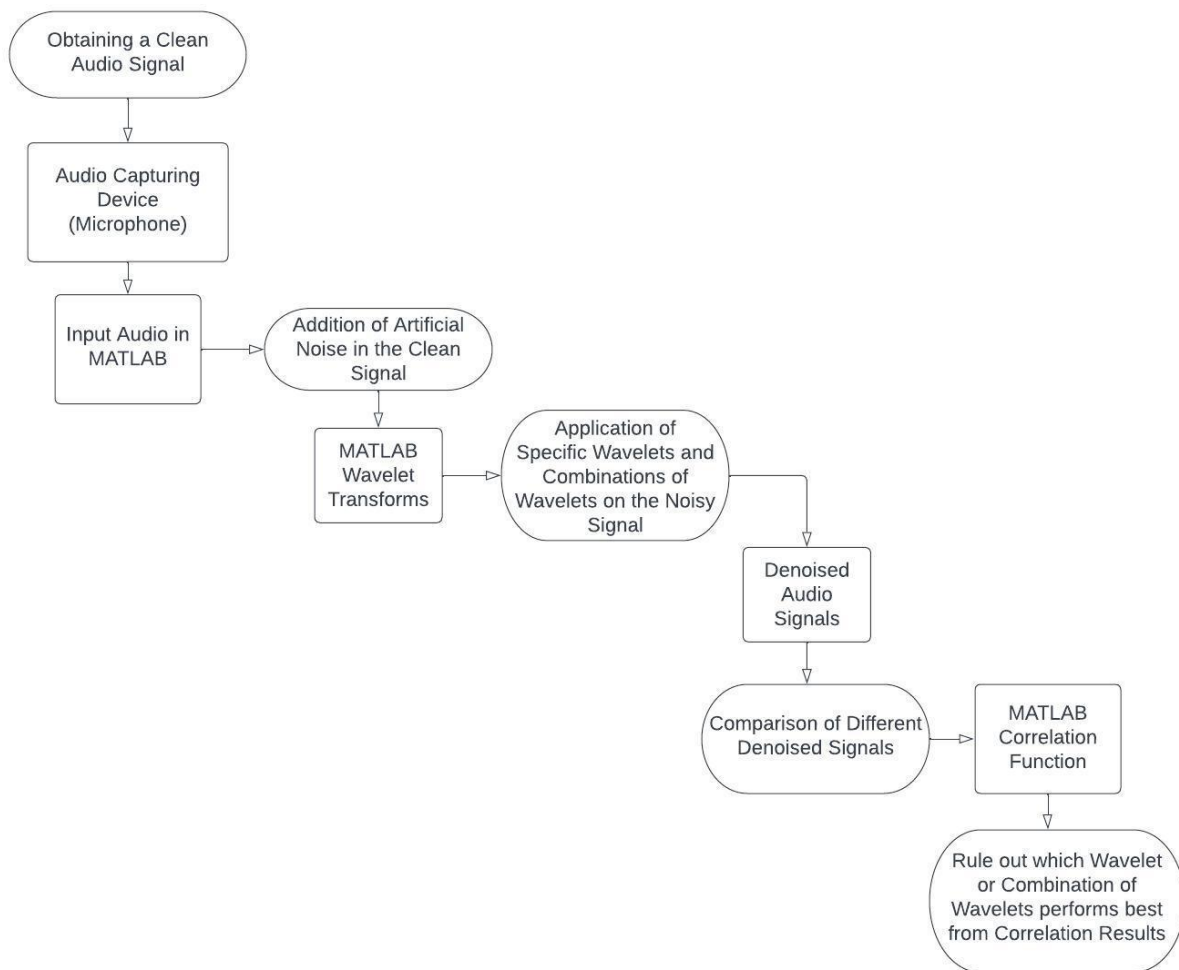


Figure 1. Flowchart for Overall Denoising Process in MATLAB

The first step is to have an audio signal obtained from the researchers. In this case, the audio signal would be a clean audio recording. The recording would be inputted in MATLAB, where an artificial noise would be added to that signal via different functions integrated in MATLAB. The clean audio recording would only be the basis of comparison later on. After the signal has been distorted via the artificial noise, wavelet transform would be applied to the signal to denoise it. Different wavelet families will then be used to denoise the artificially noised signal. Combination of different wavelet families would also be applied to the signal. The last part would be to determine the best performing wavelet or combination of wavelets in denoising the signal. The comparison process would involve correlation functions of MATLAB to compare the denoised signal to the clean signal that was recorded during the first part of the methodology.

SCHEDULE OF ACTIVITIES

Phase 1: Project Proposal			
TARGETED START DATE	TARGETED DUE DATE	TASKS	MEMBER ASSIGNMENT
Feb. 27	Feb. 27	Choose Project Topic	- Lariza - Vera Cruz

Phase 2: Final Project Proposal			
TARGETED START DATE	TARGETED DUE DATE	TASKS	MEMBER ASSIGNMENT
March 9	March 13	Start of Project Proposal	- Lariza - Vera Cruz
March 10	March 13	Research on Wavelet Transform	- Lariza - Vera Cruz
March 10	March 13	Project Description	- Lariza
March 10	March 13	Project Methodology	- Vera Cruz
March 12	March 18	Installation of Necessary Software and Toolboxes	- Vera Cruz
March 12	March 18	Start of Programming in MATLAB	- Lariza - Vera Cruz

Phase 3: Project/Document Review			
TARGETED START DATE	TARGETED DUE DATE	TASKS	MEMBER ASSIGNMENT
March 20	March 22	Finalization of Code	- Lariza - Vera Cruz
March 22	March 25	Review of Project Paper	- Lariza - Vera Cruz

Phase 4: Demonstration			
TARGETED START DATE	TARGETED DUE DATE	TASKS	MEMBER ASSIGNMENT
March 27	April 5	Finalization of Project Paper	- Lariza - Vera Cruz
April 5	April 8	Recording for Video Presentation	- Lariza - Vera Cruz

REFERENCES

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