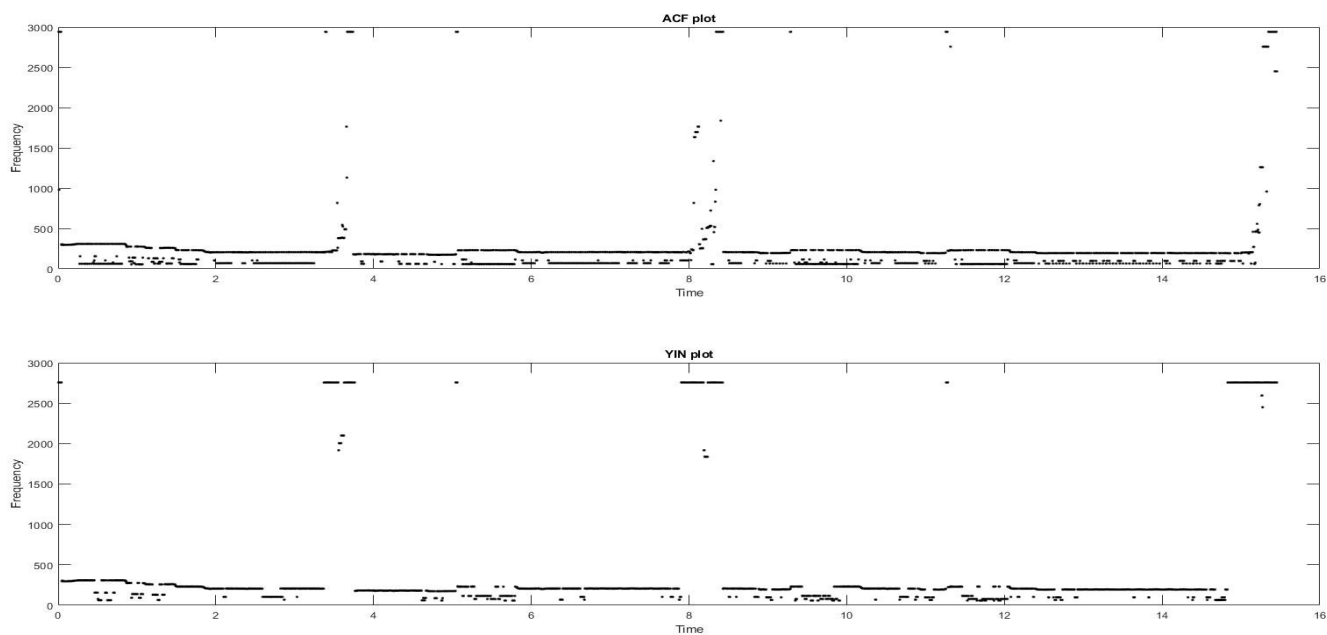# Assignment 4

Audio Content Analysis
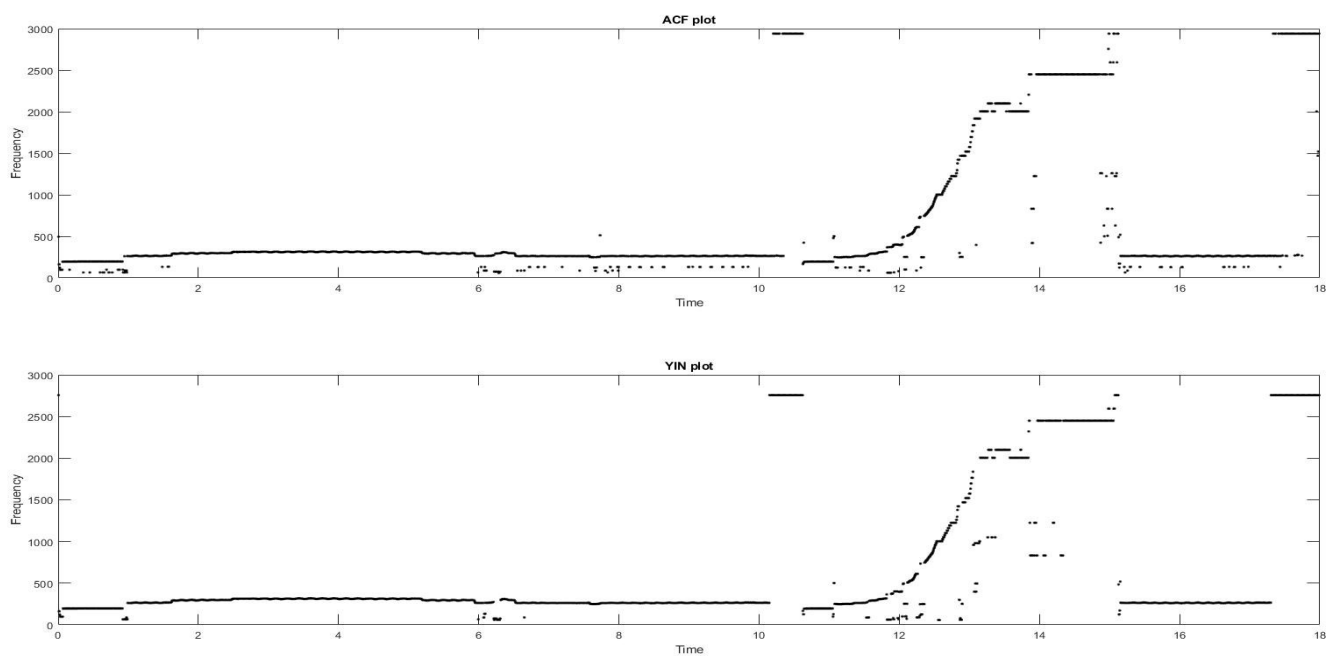Aakaash Jois – N14182682 – aj2309

Problem 1

jazz2REF:

T08-violin:

Problem 2

jazz2REF:

When comparing the ACF and YIN for the jazz2REF audio, we can clearly observe large octave error produced in ACF technique. While YIN does have octave error, it is significantly lesser than ACF. We can also see that, for silences in audio, ACF generates a lot of noise while YIN just gets a very high frequency value.
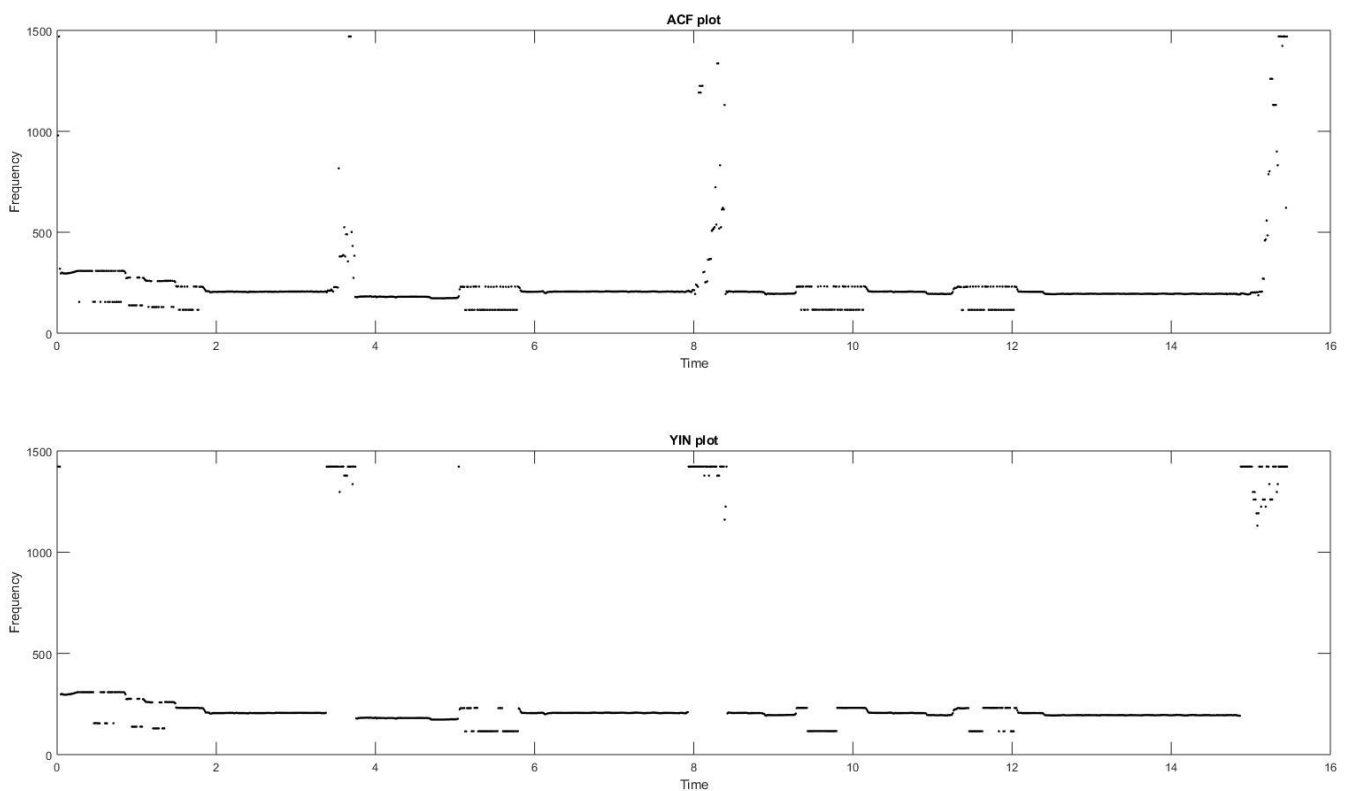
T08-violin:

Here too, we can observe a large octave error produced by the ACF technique.

Problem 3

win_size = 2048   hop_size = 512   min_lag = 30   max_lag = 400

jazz2REF:

When using the above parameters, we can observe the reduction in the noise of both the pitch detection functions. The octave error has been reduced and detected pitch is cleaner and easier to read. The small steps in the change of pitch value can also be observed easily than with the default parameters.

T08-violin:

ACF plot

YIN plot
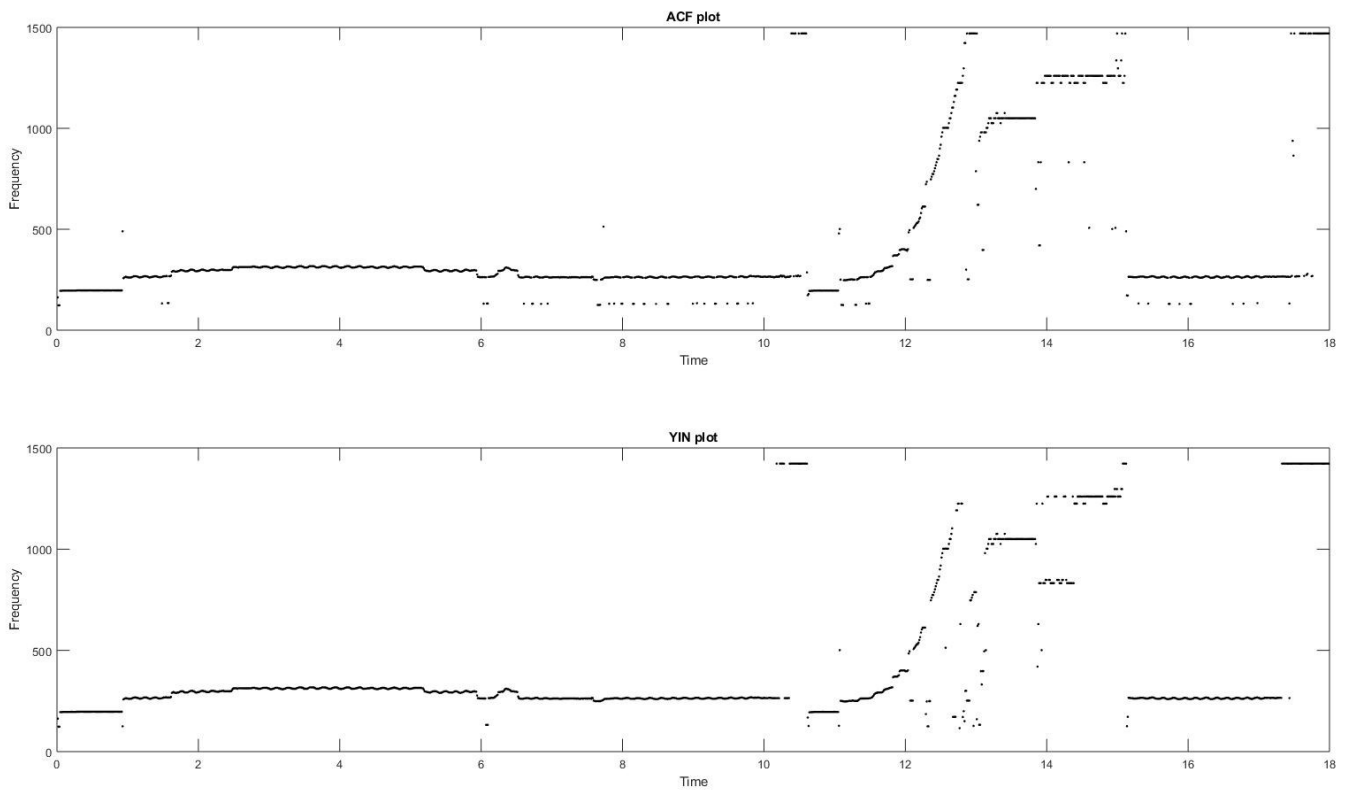
Here too, we can observe the pitch is easier to read because of reduced noise and errors. With these new parameters, we can even observe the small modulation to the pitch of the violin sound which can be heard when playing the audio.

Problem 4

The pitch detection algorithm proposed by Li Hui et al., is based on the ACF function and average magnitude difference function (AMDF) [1]. This method can greatly reduce the computation cost of the pitch detection algorithm by replacing the multiplication in ACF by a simple addition.

References

[1] Hui, Li, Bei-qian Dai, and Lu Wei. "A pitch detection algorithm based on AMDF and ACF." *Acoustics, Speech and Signal Processing, 2006. ICASSP 2006 Proceedings. 2006 IEEE International Conference on*. Vol. 1. IEEE, 2006.