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Performance Analysis of Software Implementation of Reproducing Music from Musical Notes (Mozart)

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***Abstract*— In** this research take a picture of Mozart of any music or instrument than the process on the captured image and all information pass to the MATLAB for image processing. The Algorithm separates the one line of Mozart and then separate another line in this way separate line by line of the whole Mozart. After separating line another step is to separate beat one by one from the separated line from the picture of Mozart. In this way, all the line and beats of Mozart are separated using the MATLAB software. When all the beats and lines are individual then find the meaning according to their symbol and combined the entire tune related to whole music or instrument. Then whole the music which is combining from the image of Mozart (musical notes) is played through the MATLAB software.

Keywords- *Image processing, MATLAB, Mozart*

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I. INTRODUCTION

First we take little bit knowledge about musical notes and letter classification of it. In the music, note is the pitch and duration of sound. What is a staff line? A staff line has five horizontal lines and four gaps. It is basic notation of musical notes. Musical notes should be written on this staff lines. Notes represent a tone while rests represent the absence. In the musical symbol it contains specific time duration for tone and rest. Music is the mixing of the tones and rest of the in specific manner for smoothness of the music instead of single tone.

There are different systems of naming the tones. In this research, we used the most common in English scientific usage tone would be called C4 or middle C. C4 represent the middle frequency of the piano instrument. The left side key from the C4 represent lower frequency and right side key from the C4 represent higher frequency in piano. The Bass clef and treble clef and notation related to C0 to C9 are shown in above fig. 1.1.

II. PROPOSED METHOD

The fig.1.2 shows the detail block diagram of the research. Here first the image of musical note has been taken. Then this image is passed for the grey scale conversion. After the grey scale conversion it is passed to the black and white conversion and we got the binary image. Then if needed to correct alignment of musical notes skew angle correction is performed on the binary image.

Thereafter to extract only informative and meaningful musical notes segmentation is performed and background is eliminated. After segmenting the image three feature extraction algorithms like SURF, MSER, and Harris are perform on segmented image as well as existing database to extract meaningful feature from every musical note.

There after best matching algorithm, find maximum matching similarity between segmented image and data base to identify the musical note. Finally in order to play music perfectly the musical notes are played for their respective interval of time using audio mixing procedure.

III. PROPOSED RESULT

The work flow of the research is shown in the fig.1.3. Here first take the image of Mozart then it is sliced into horizontally. After slicing horizontally and slices into vertically to separate symbol independent. After that to recognize the independent symbols of the Mozart. At last tone related the notes are mix with respect to the time interval to play proper music.

IV. RESULT

First we take the image of Mozart of poem which is “Ring around the Rosie”. The original image of the Mozart is shown in the fig. 1.4.1.

Then it is passed to the preprocessed step. After the preprocessing we take the image shown in the fig.1.4.2.

After the preprocessing of the image the image is passed to the step of black and white conversion to get binary image. The binary image is occupied zero and one to describe the image. The binary image after the preprocessing step is show in the fig. 1.4.3.

Then black & white image is converted into inverted black & white image which is shown in the fig.1.4.4.

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After converting inverted black and white image it is spliced into horizontal dimension. The horizontal spiced image is shown in the fig. 1.4.5.

After the horizontal slice, the line of musical note is segmenting. The First line segmented is shown in fig. 1.4.6 and the second or last line is shown in fig.1.4.7.

Then slicing into horizontally and vertically of the Mozart image which is shown in fig.1.4.8.

After the slicing into horizontally and vertically, identify the symbol of Mozart is shown into the fig.1.4.9. Then arrange into the sequence to play music properly with respect to the time of musical notes. The sequencing of the notes is shown in the fig.1.4.10.

At last the audio mixing is done for generating smooth music and avoiding to the simple single tone. The audio mixing is mix the tone of notes with respect to the time interval. Therefore the audio mixing is shown in the plot which is shown in the fig.1.4.11.

V. CONCLUSION

There are many algorithms in the MATLAB for image processing. There are many musical notes related to the different instruments and we can play with the MATLAB which is an extra feature of MATLAB. Captured image of musical notes can be easily inserted to the MATLAB and with the help of algorithm we can separate these staff lines of musical notes. Now the symbols are discrete from the staff lines and data base related the symbol is found from the whole databases which have been inserted into the MATLAB with the help of proposed algorithm. Therefore it is complex and time consuming while in our proposed method without removing staff line identify the symbol of musical notes. The database of music related to the symbol can then be successfully played in the MATLAB Software.

ACKNOWLEDGEMENT

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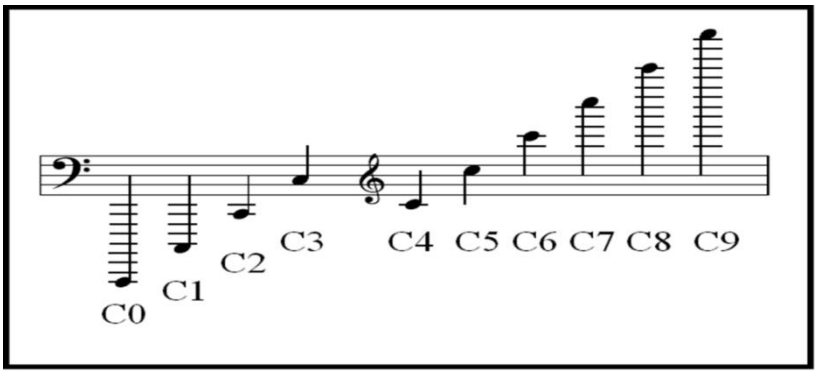

Fig. 1.1: Musical Notes of C0 to C9

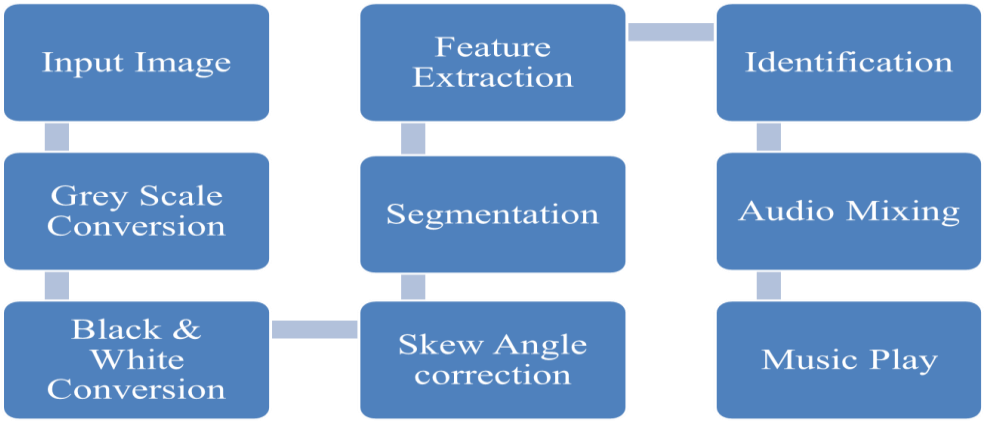

Fig. 1.2: proposed method

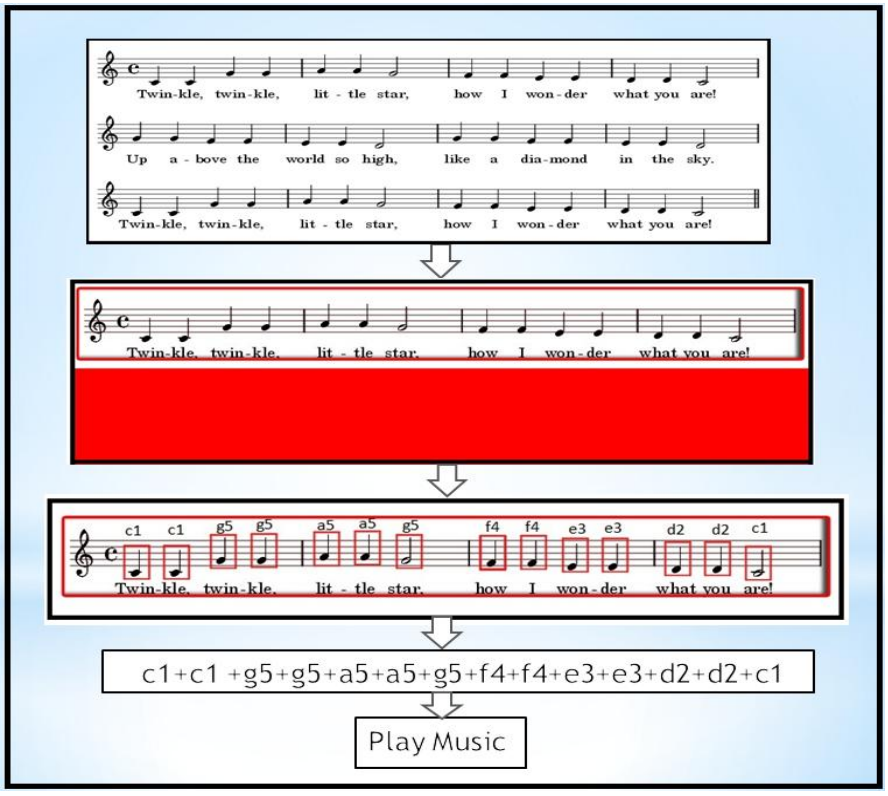

Fig. 1.3: Work flow of proposed method

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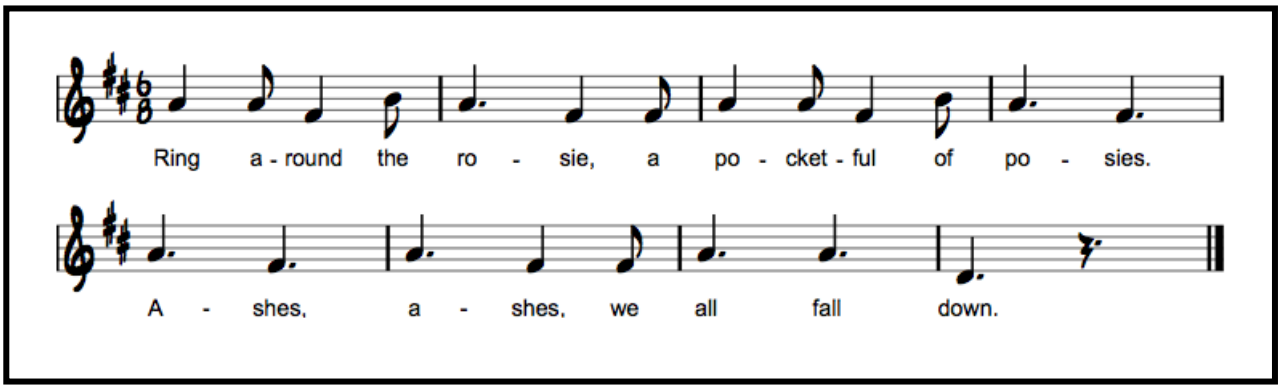

Fig. 1.4.1: Original Image

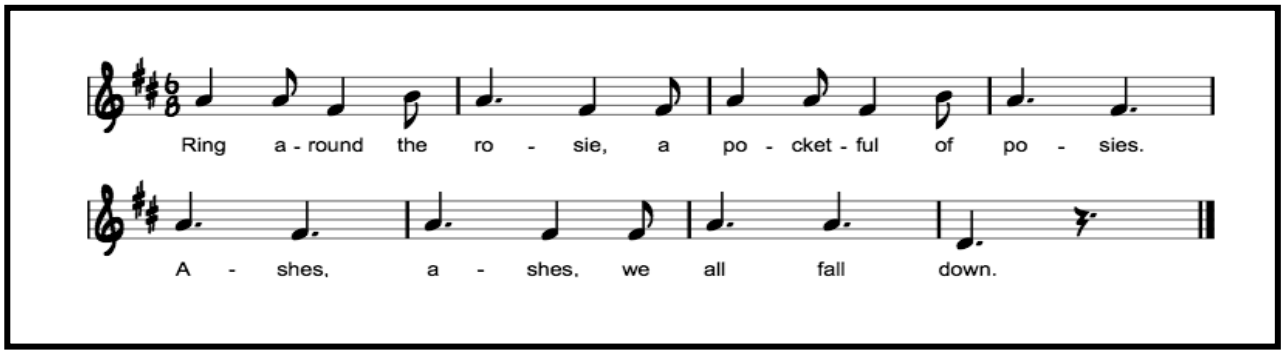

Fig. 1.4.2: Preprocessed Image

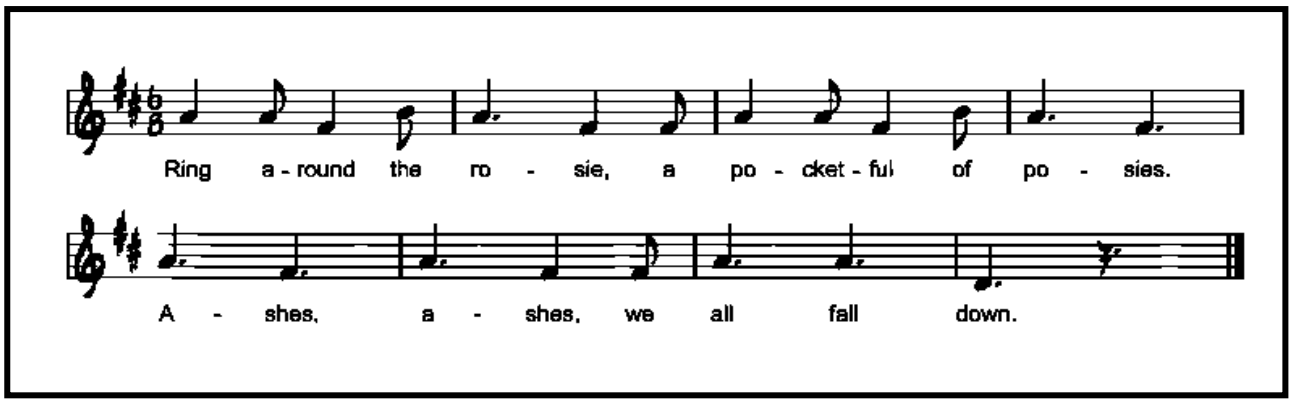

Fig. 1.4.3: Black & White Image

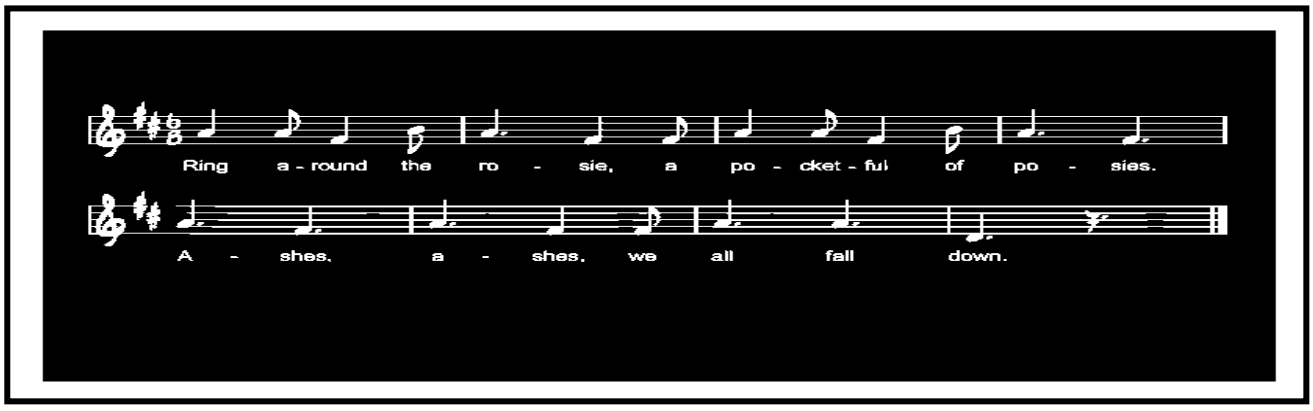

Fig. 1.4.4: Inverted Black & White Image

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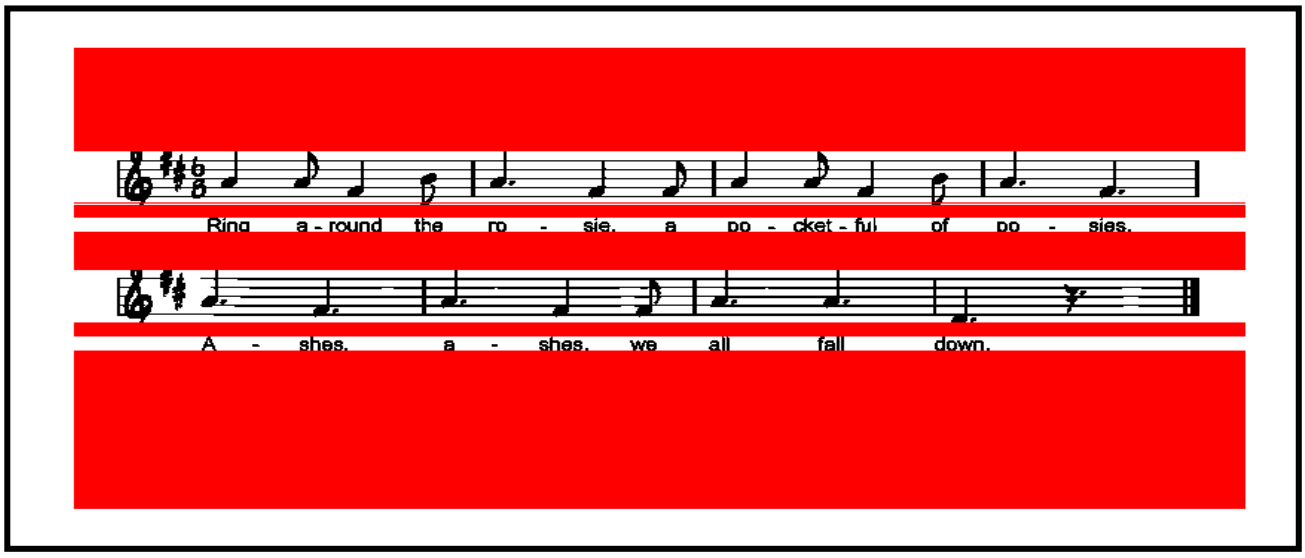

Fig. 1.4.5: Horizontal Spited Image

Fig. 1.4.6: First Horizontal Slice

Fig. 1.4.7: Second Horizontal Slice

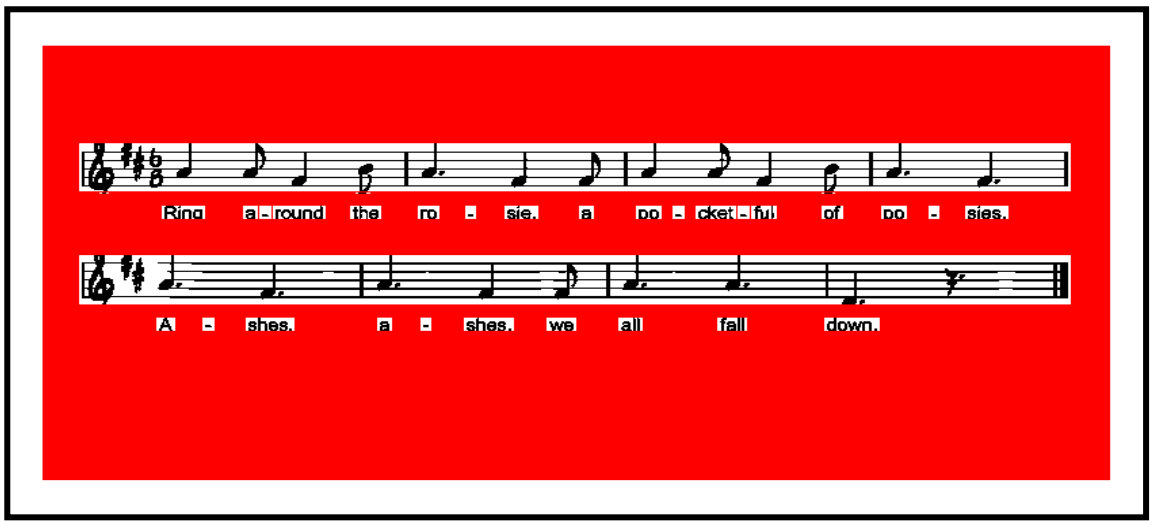

Fig. 1.4.8: Horizontal and Vertical Slice

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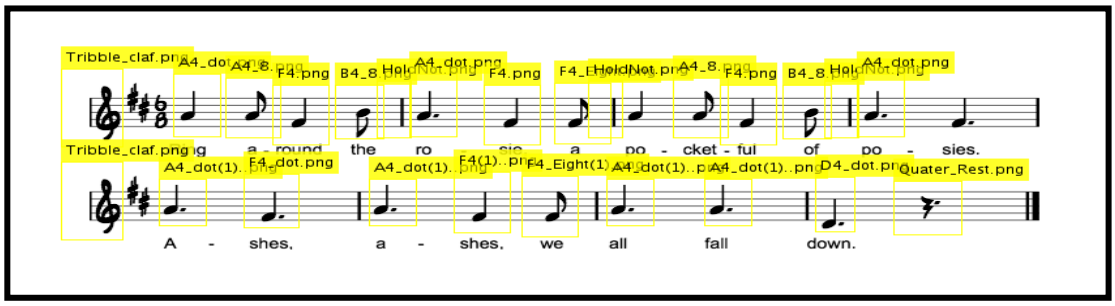

Fig. 1.4.9: Identify of Musical note

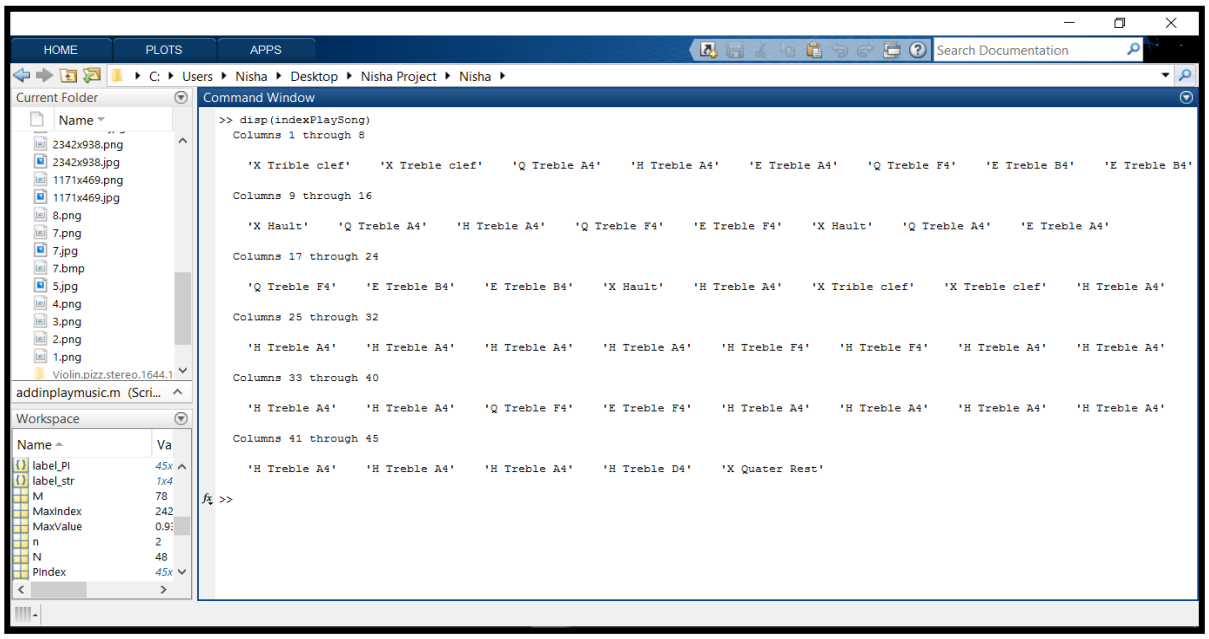

Fig. 1.4.10: Sequence of Musical note

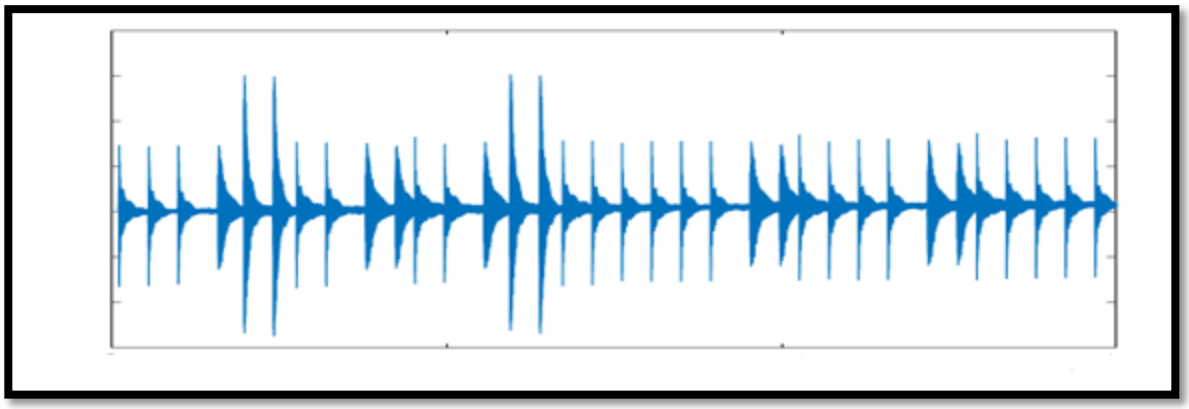

Fig. 1.4.11: Final Result