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An Application that Converts Musical Tones to their Respective Notes

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ABSTRACT: -

Musical tones to notes converter is an AI/ML based application which extracts the information from the music played on a musical instrument like guitar or piano and convert the tones into its corresponding musical notes which would result in generation of a music sheet and eventually the generated sheet will be made available to the user.In this project we are creating a tool which automatically transcripts musical information which is an automated conversion process from played music to symbolic notation and the user can get the extracted notes in the form of a MIDI file and music sheet and to interpret and visualize the output you can also play the generated file on a virtual instrument with MIDI visualizer.

Key-Words: - Tones,Notes,AI/ML,Musical Instrument,Converter.

Introduction

In this project we are creating a tool which automatically transcripts musical information which is an automated conversion process from played music to symbolic notation and the user can get the extracted notes in the form of a MIDI file and music sheet and to interpret and visualize the output you can also play the generated file on a virtual instrument with MIDI visualizer.

Problem Formulation

Many of us started learning music by practicing a particular musical instrument and practicing different tunes on it, but find it difficult to identify the notes of a particular tone played through an instrument in a song. So by understanding this problem we have come up with a solution of musical tones to notes converter .With the help of this application user can easily convert the musical tones into the readable format musical sheet which will tell the user at which point of time which note was played.

Literature Review

Existing System	Advantages	Disadvantages	Reference link
piano2notes	Can directly transcribe from a youtube cover by providing it's link.	Only available for piano covers, generated sound from MIDI file is different from original.	https://piano2notes.com/en
noteflight	Available for various instruments like violin, guitar, piano etc.	In order to transcribe and generate score sheets you have to buy mp3 files from it's marketplace.	https://www.noteflight.com
soundslice	Available for various instruments and gives ability to create and edit music sheets in real time.	No free version is available and doesn't provide the feature to download or share your converted sheets.	https://www.soundslice.com/homepage/

Methodology

- Collect single instrument tracks without vocals and create a structured database.
- Create a virtual instrument for hands on practice with a read sheet music feature.
- Make an AI/ML system that recognizes notes played at a particular time from listening to its track.
- Create a music sheet from the data collected from the system and transfer it into the virtual instrument to be read and played or exported separately in the form of pdf.
- Check if the transcription is accurate or not by reading or playing the generated file.
- Check the response of the virtual instrument whether the notes are displayed on time or not.

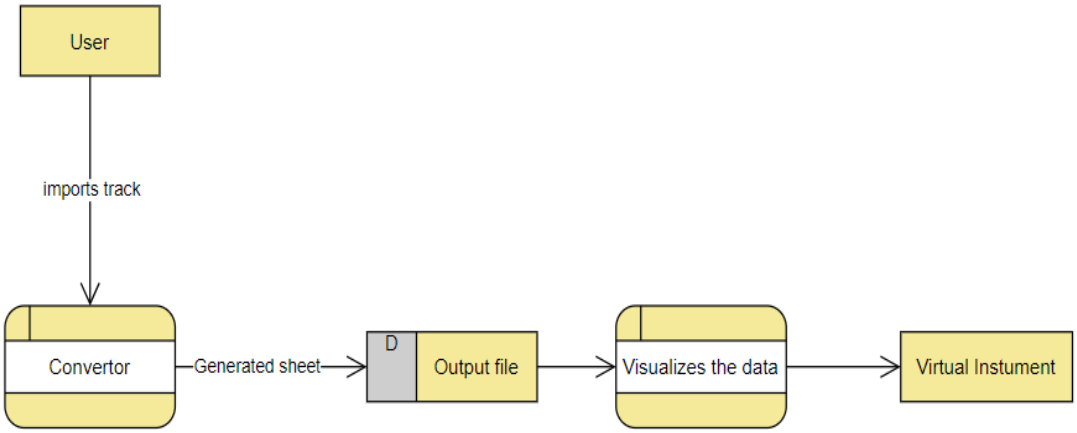

Fig.1 DATA FLOW DIAGRAM

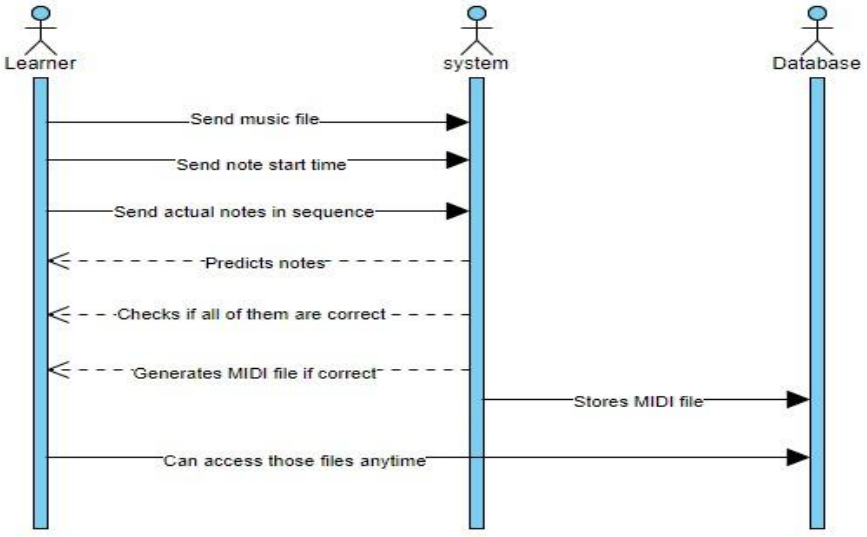

Fig.2 SEQUENCE DIAGRAM

The information like pitch estimation, notes timestamps and duration would be extracted from the .wav file imported and according to the gathered information a MIDI file would be generated which than be transcribed into symbolic notations known as score sheets and to measure the accuracy, test the capability of being put into effective operation and real-time interaction the generated MIDI file would be passed through the virtual instrument.

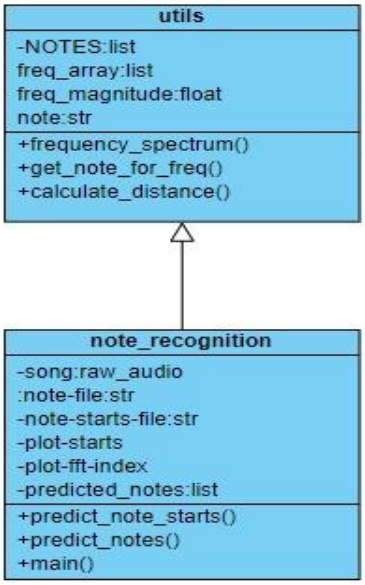

Fig.3 CLASS DIAGRAM

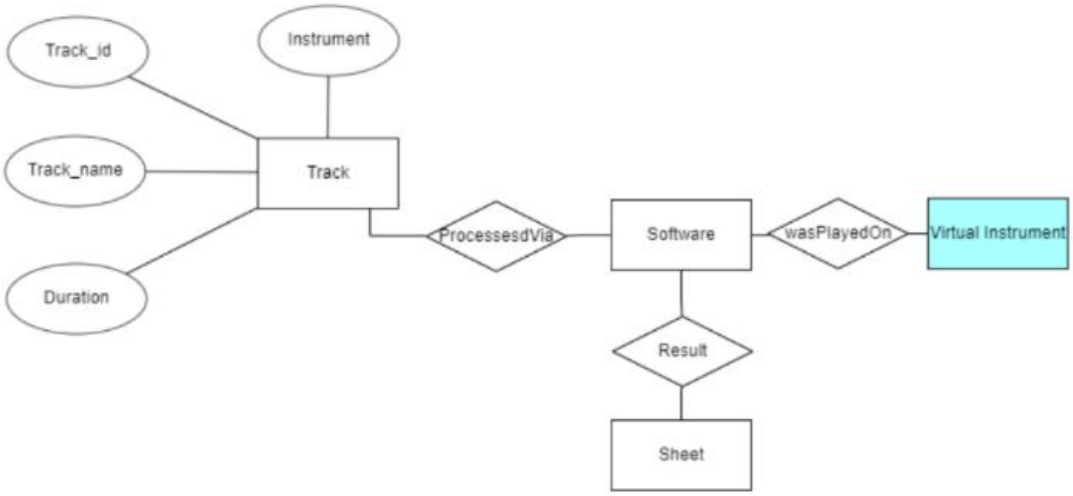

Fig.4 ER DIAGRAM

Result Discussions

The result generated after some tuning is acceptable. It is not accurate for every audio file and requires further optimisation. It still works fine for small and simple audio files as you can see below:

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Actual Notes

['G', 'A', 'B', 'G', 'C', 'E', 'D', 'B', 'G', 'A', 'B', 'D', 'A',
'C', 'B', 'A', 'G']

Predicted Notes

['G', 'A', 'B', 'G', 'C', 'E', 'D', 'B', 'G', 'A', 'B', 'D', 'A',
'C', 'B', 'A', 'G']

Levenshtein distance: 0/17
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Conclusion

- We will be building an expert ML/AI model which will retrieve information from music tracks, mostly instrumental versions and process them to create music sheets containing symbolic notations of the notes and building an virtual instrument where the sheet can be read for hands on practice.
- Limitations :- The converter will only be able to convert tracks which contain only the music of a single instrument and which are without vocals.

Acknowledgment

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References

https://www.soundslice.com/homepage/
https://www.noteflight.com
https://piano2notes.com/en
https://scorecloud.com/
https://www.researchgate.net/publication/224112671_Pitch_Estimation_of_Notes_in_Indian_Classical_Music

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