SWARRECOG- THE EUPHONY AIDE

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Abstract: Almost everyone is interested in learning music. But due to lack of knowledge about music, they are unable to make it happen. It is where this system comes into picture-The Swar Reorganization System will help musicians as well as music enthusiasts to have notations of a song on-the-go which in turn will elevate their music literacy.

The need as you know is we live in a digital era where almost each and everything we use to interact with each other is digitalized. The main motive behind it being computerized is that it will help musicians and music enthusiast with an opportunity to record, learn and share their ideas whenever and wherever required i.e. providing portability with it which as we all know is the most vital and required function of a system these days, as your system moves with you.

Keywords: SWARRECOG, *sārangī*in

I. INTRODUCTION

Indian art music encapsulates two music traditions of the Indian subcontinent: *Hindustani* music (also known as North Indian music), prominent in the northern regions of India, Pakistan, Nepal, Afghanistan and Bangladesh; and *Carnatic* music, widespread in the southern regions of peninsular India and Sri Lanka. In both Hindustani and Carnatic music, the *rāg* is the fundamental melodic framework upon which the music is built, and the *tāl*(tāla in the Carnatic music tradition) provides the rhythmic framework.

Indian art music is basically heterophonic, with the main melody sung or played by the lead artist. Often, an instrument provides a melody accompaniment by closely following the melody rendered by the lead artist. A typical arrangement in a performance of Indian art music consists of a lead performer (occasionally a duo), a melody accompaniment provided by harmonium or *sārangī*in Hindustani music and by violin in Carnatic music, a rhythm accompaniment usually provided by *tablā*in Hindustani music and *mṛdangaṁ* in Carnatic music and a constantly sounding drone in the background. The drone sound, which is typically produced by the *tānpūrā*, is the only component that adds a harmonic element to the performance.[4]

The seven solfège symbols (*Sa, Re, Ga, Ma, Pa, Dha* and *Nī* in short-form) used in Indian art music are called *swars*. With the exception of Sa (also referred toas*Ṣaḍja*) and Pa (also referred to as *Pancham*, fifth with respect to Sa), every other swar has two or three variations, where each variation is either a komal (flat), śudh (unmodified, literally means pure) or tīvr (sharp) of the basic swar and has a specific function in a rāg rendition.

MIDI (Musical Instrument Digital Interface) is technical standard that describes a protocol, digital interface and connectors and allows a wide variety of electronic musical instruments, computers and other related devices to connect and communicate with one another. A single MIDI link can carry up to sixteen channels of information, each of which can be routedto a separate device and carries event messages that specify notation, pitch and velocity, control signals for parameters such as volume, vibrato, audio panning,cues and clock signals that set and synchronize tempo between multiple devices.

I. Literature Survey

ScoreCloud, MuseScore and many more are existing systems which helps users to convert music into notations. But these all providers transcript into western notation. Whereas, here what we are aiming to do is the same in *Hindustani Bhatkhande Paddhat* (method). As well as these all systems are available only for desktop users and user base is also overwhelming, after our brief survey it came to our attention that no such system exists for android platform and hence we have taken this opportunity to venture in this domain and develop a masterpiece which will be available to its user on the go.

2. SYSTEM ANALYSIS

The SwarRecogis about taking in a MIDI file, reading it by bytes and interpreting the information inside, and then converting it into a readable musical score. Every MIDI file follows a format, so it is possible to make an application to access all pertaining information inside. Accessing MIDI file will be done by reading the file word per word to find the pattern. The data read will be in object file so it is passed by reference. After the data is read, it will be sent immediately to be processed by another method and the graphical representation in Hindustani notation will be created.
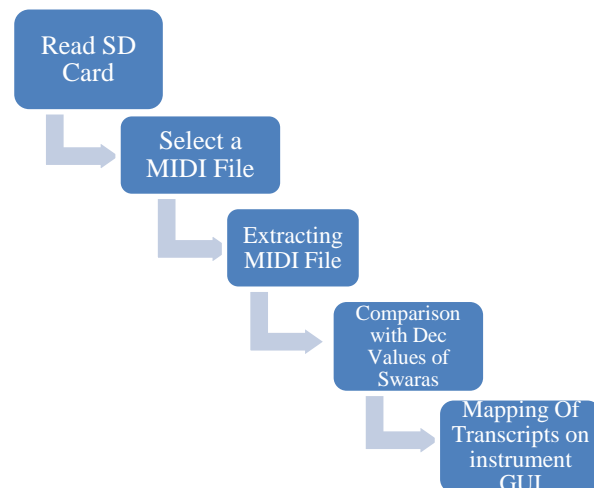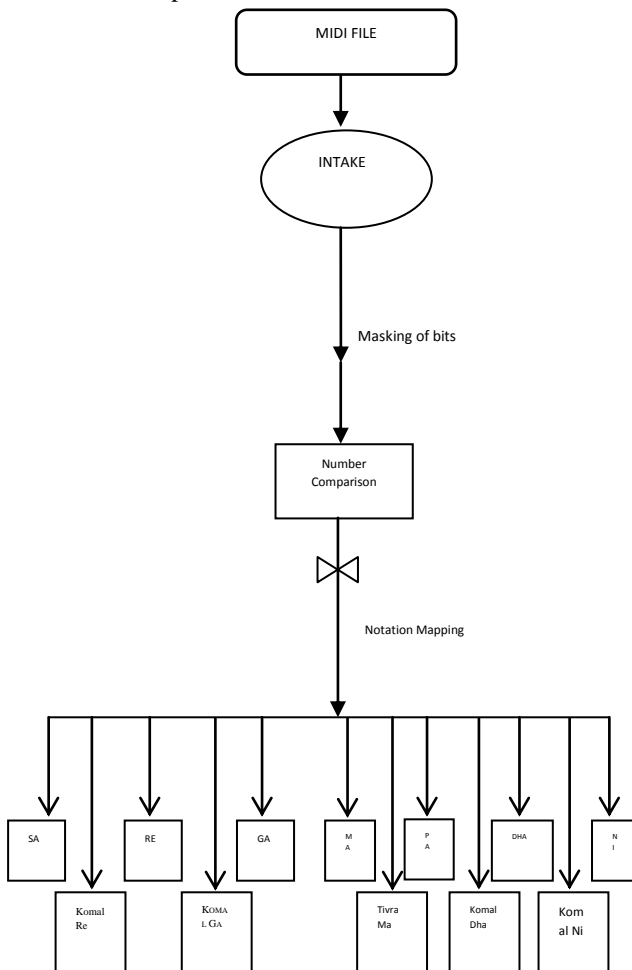

Fig 2.1 Flow Diagram

Figure 2.1 clearly shows the flow that the user might do with the application. The user will start by giving an input to the application regarding the location of the MIDI file. This can be done by using Play Button provided on the GUI, which opens the file browser, where the user can browse to the location of the file and choose it. After the file path is entered, the user must check the file validity. If the path provided refers to a MIDI type 2, a non MIDI file, or a non-existent file, an error dialog box will appear to notify the user of this failure. If a correct path has been confirmed, the user will be enabled of running the transcription process. The application will then run the process of transcripting MIDI and give result to the user.

3. METHODOLOGY

As the file is selected it is checked for its validity, once the file selected is a termed as a valid MIDI file it will continue by checking and drawing the time signature and pitches. The pitch will again be checked for its individual accidentals, sharp or flat. Since there are 7 natural pitch, there are 5 accidentals in total. Sa, re, Re, ga, Ga, Ma, ma, Pa, dha, Dha, ni, Ni. For example, Sa = 60,re = 61, Re = 62, ga = 63, Ga = 64,Ma = 65, ma = 66, Pa = 67,dha = 68, Dha = 69, ni = 70, Ni = 71.The pitch number will be divided 12 and checked if the remainder is 1, 3, 6, 8, 10. Those are the numbers that is a sharp or a flat, while the rest are natural pitch.

The method will next continue the painting of the score by drawing Synthesizer and highlighting the notes being played. There is a different color used for both hands to differentiate,

1. Keys highlighted in Blue represent the left hand Progression
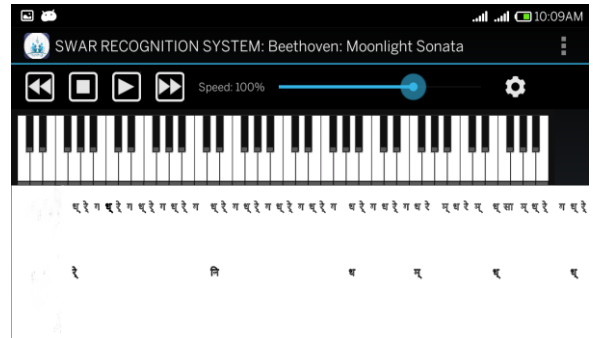2. Keys highlighted in Grey represent the Right hand Lead

Fig.2.2 Instrument GUI

Below the GUI, the transcriptions of song are played in sync which will help the user to know which note is currently being played.

There is also a media control bar provided as can be seen in Fig.2.2 from where user can play, stop, reverse, forward the current song.

Another important part of this media bar is the speed control interface which allows user to slow down or speedup the current song allowing him/her to practice according to their tempo. The speed bar can slow down upto 10% and increase the speed up to 150% of the original tempo allowing user a wide range of choice.

ADVANTAGES

1. The first and foremost advantage of this system is that it enables an independent learning environment.
2. A feast for musician and music enthusiasts as transcription in Hindustani Notations.
3. Portability, as an application for mobile platform, user can use it at his will wherever he pleases to do so.

CONCLUSION

Since music has become an inseparable part of human life, Musical Instrument Digital Interface (MIDI) has been a help to musician and music lovers. Not everyone who is willing to learn music is able to do so due to circumstances and issues. SwarRecog taking the advantage of MIDI format enable the individual to do so by providing the user with the transcription of the song in Hindustani notation allowing him to understand the composition, learn it and reproduce it at his will. This paper shows that MIDI file can be converted into musical notation because all the information needed is contained inside the file itself. The application shows that the transcription is possible, as long as the file inputted is the correct MIDI type 0 or 1file.

REFERENCES

[1] RikipGinanjar and Ivan Iskandar "MIDI Conversion to Musical Notation" 2011 FirstInternational Conference on Informatics and Computational Intelligence.

[2] Carol L. Krumhansl "Cognitive foundation of musical pitch" Department of Psychology Cornell University.

[3] Gopala K. Koduri1, Joan Serra2, and Xavier Serra "Characterization of intonation in carnatic music by parameterizing pitch histograms" Music Technology Group, Universitat pompeuFabra, Barcelona, Spain, Artificial Research Institute (IIIA-CSIC), Bellaterra, Barcelona, Spain.

[4] Sankalp Gulati, AshwinBellur, Justin Salamon, Ranjani H.G., VigneshIshwar, Hema A Murthy and Xavier Serra" Automatic tonic identification in Indian art music".

[5] Justin Salamon, Sankalp Gulati and Xavier Serra "A multipitch approach to tonic identification in Indian classical music" Music technology group Universitat PompeuFabra, Barcelona, Spain.