Music Transcriber

[Image of a person playing a flute, a metronome, and musical notes with the text "Music Transcriber" between them]
Note Recognition Module

- Use Codec to amplify the analog audio signal and convert it to a digital signal.
- Obtain a frequency spectrum of the audio sample using FFT.
- Detect the peak frequency of the spectrum.
- Convert this into a recognizable frequency in Hertz.
- Use a look-up table to relate the peak frequency to a musical note.
- Use a counter to measure the duration of a note as the number of beats between a note change. The frequency of beats depends on a user defined tempo.
Note Recognizer

INPUT

ANALOG AMPLIFIER → A/D CONVERTER

CODEC

AUDIO INTERFACE

PRE-FFT

FFT

TEMPO CLOCK

Beat

COUNTER

New_Note

COMPARE

NOTE

LOOK-UP TABLE

New_Note

Real_Data

Im_Data

Index

Peak_Index

Audio

Ready

Pulse_Ready

Audio_Cont
Video Display

*Produces music stave video output from note values and durations*

**Tracker**
- Follows the writing on the stave, translates the note value into its correct position on the screen.
- Tells the Video where to display the next note.

**Video**
- Uses sprites to display background staves and clefs.
- Uses a moveable sprite to display a new note at a given position.
- The “note” sprite reads different note fonts from a ROM, so as to display the different shapes.
- The shape of the note is given by its duration.
Coordinates for note position
Video Module

Stave/Treble clef Display

Count/addr converter

Video RAM
(1024*764) x 1

ROM 4 x 96

Note display

ROM storing note fonts
(full note, quarter note...)

Set of video signals from XVGA
(hcount, hsync, vcount...)

Non-erasable video output

Convert black & white to color

Convert black & white to color

1

1

3

to_XVGA

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to_XVGA
Additional Features

➢ Rythmical complexity
  • Bars
  • Odd rythms
  • Tied notes

➢ Musical Vocabulary
  • Higher timing precision
  • Larger note span

➢ Complex Metronome