

Institiúid Teicneolaíochta Cheatharlach



At the Heart of South Leinster

Functional Specification

Institute of Technology, Carlow

B.Sc.(Honours) in Software Development

CW238

Project Title

Musical Tablature Editor

Document Date

14/12/12

Student Name and ID

Robert Connolly C00123951

Supervisor

Paul Barry

Table of Contents

| | |
|-----------------------------------|----|
| Introduction | 3 |
| Application Description..... | 3 |
| Application Users..... | 3 |
| Application Functionalities | 4 |
| Core Features..... | 4 |
| 1. Electric Guitar Tablature..... | 4 |
| 2. Note Effects and Duration..... | 5 |
| 3. MIDI Playback..... | 6 |
| Discretionary Features..... | 6 |
| 4. Multi Track Tablature..... | 6 |
| 5. Pre-defined Chords..... | 6 |
| 6. Metronome | 7 |
| Exceptional Features..... | 7 |
| 7. Scale Generator | 7 |
| 8. Drum editor | 8 |
| Metrics..... | 9 |
| Precedent for Application..... | 9 |
| Similar Applications..... | 9 |
| How my application differs | 10 |
| Bibliography..... | 11 |

Introduction

This document will describe the core, discretionary and exceptional functionalities of my application. The core functionalities describe the mandatory functions of the application. These are the basic requirements that must be implemented. The discretionary are extra functionalities to be added after the core is implemented. The exceptional functionalities are functions that will make this application outstanding in quality.

This document will also specify what the application is and does, who the target users are, how will the application be deemed successful, precedent's for my application, and how my application differs from these precedents.

Application Description

The application is for writing and learning music in tablature form, for the electric and bass guitar, and drums. It is meant to have a simple GUI so that it is intuitive enough to write music and learn other people's music in an easy way. That means users can write tablature using the representation of a fretboard. They can write tablature for the drums, for any particular part of the drums, from a list of its different types of percussion i.e. hi-hat, snare, etc. The user does this by inserting the place/time in the music the percussion type is to be played. No advanced knowledge, such as musical notation, needs to be known by the user.

Users can use the application just to keep a record on file of their music for future reference.

The application is for a very intuitive and simple way to write music and learn people's music.

Application Users

It is aimed at musicians/non-musicians with no musical notation knowledge, who:

- want to write their music in tablature form for a record of it.
- want to playback their music and hear what it sounds like in order to aid song writing.
- want to write and playback new songs that have more than one part(track), and don't have other musicians available at the time to play the other parts.
- want to give their tablature to fellow musicians or band members to learn their music.

- want to collaborate with others, for example, where each band member writes there separate part(track) for new songs.
- want to write music and experiment without having to learn an instrument.

Application Functionalities

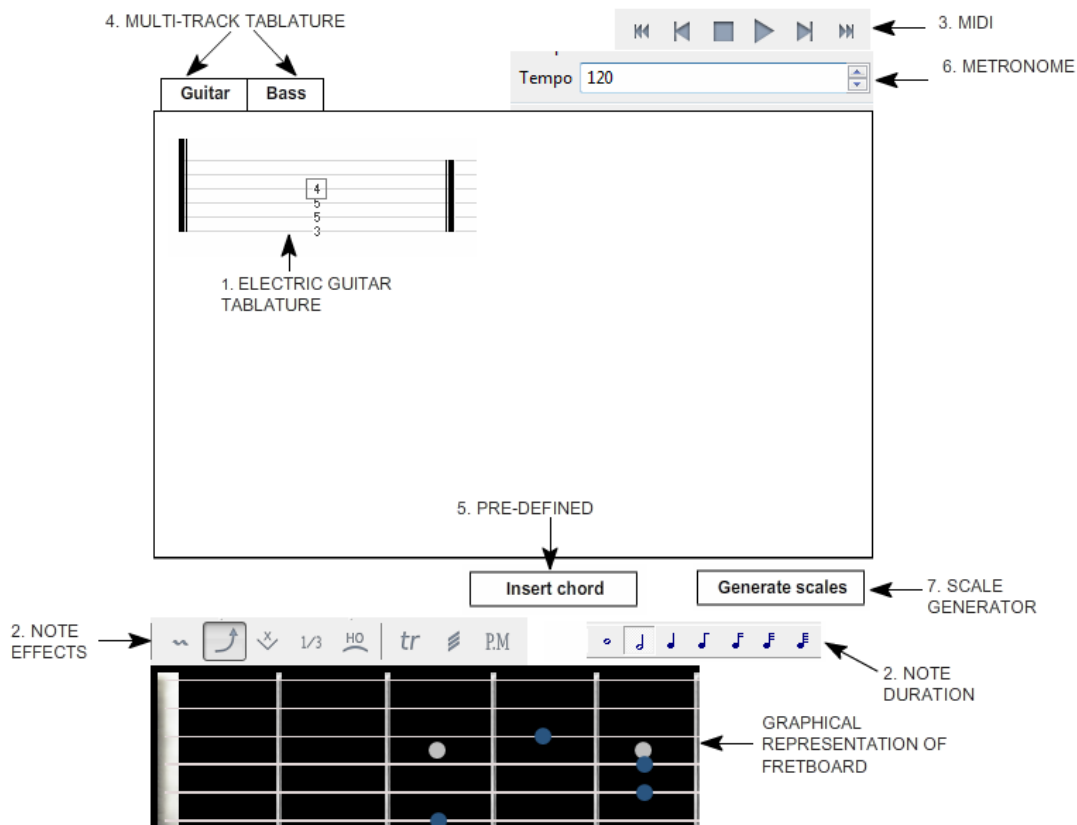


Fig 1: Mock up screenshot of the GUI of my musical editor(Some features in screenshot taken from Power Tab and Tux Guitar). 1.[Pow], 2.[Tux]

Core Features

1. Electric Guitar Tablature

The user will be able to write tablature for the electric guitar, from a graphical representation of the guitars fretboard. They use the mouse pointer to click on the appropriate fret of whatever string they choose. The frets they have used for the current chord only, are highlighted to show what they've written(the blue dots in Fig 3). These will be displayed on tablature above the fretboard, with the actual fret numbers displayed on their respective strings(See Fig 2) as they are clicked on, on the fretboard. The tablature keeps a record of what they have written so far. The fretboard is only for writing each chord or note played at one time within the tablature.

To enter in the next chord or note to play, the user presses the right arrow key to move to the next part.

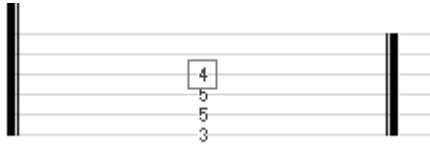


Fig 2: Electric guitar tablature. 2.[Tux]

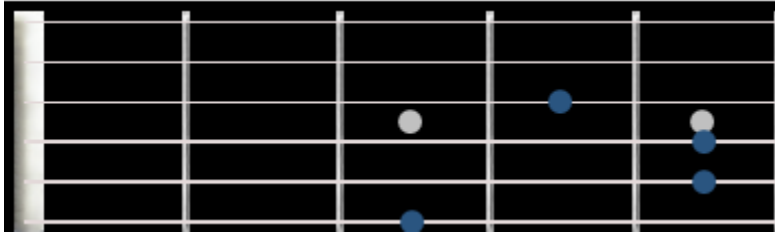


Fig 3: Electric guitar fretboard with users played notes highlighted in blue. 2.[Tux]

2. Note Effects and Duration

The user will need to be able to tablaturise how each note is played with effects (bends, hammer-ons, etc) and for how long (half note, quarter note durations, etc). They select the appropriate note on the tablature with the mouse pointer, and then click the appropriate button to affect note the way they want. For example, as shown in Fig 4, the user selected the fourth fret on the third string in the tablature, and applied a bend to the note by pressing the bend button (See Fig 5).

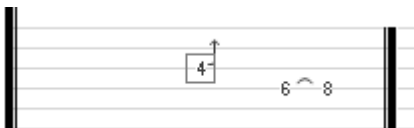


Fig 4: Bend applied to note in tablature. 2.[Tux]

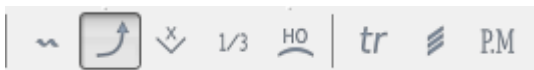


Fig 5: Bend button used to apply bend to note in tablature. 2.[Tux]

The user will also be able to change the duration of each note, for example, half note, quarter note, etc. This will be done by the user clicking a button for the appropriate length, after selecting the note or chord that needs to be changed. See Fig 6.



Fig 6: Note duration buttons. 1.[Pow]

3. MIDI Playback

The user will be able to playback what tablature they have written, to see what it sounds like, and/or what it sounds like has been written properly. Playback can begin from anywhere within the written tablature. The user presses a play button to playback from the beginning, or uses the mouse pointer to click into whatever bar of music they want to start playback from. They then press another play button to playback the tablature from the point in the bar they selected. See *Fig 7* for a similar playback toolbar. Playback uses MIDI.



Fig 7: Playback toolbar. ^{2.}[Tux]

Discretionary Features

4. Multi Track Tablature

The user will be able to add more than one track to the tablature, so they can write separate tablature for different guitar parts. This will include bass guitar. The user presses a button to add another track. A new tablature opens on the GUI. Each track will have a separate tab, so the user can go between tracks by just clicking on the appropriate tab. See *Fig 8*.

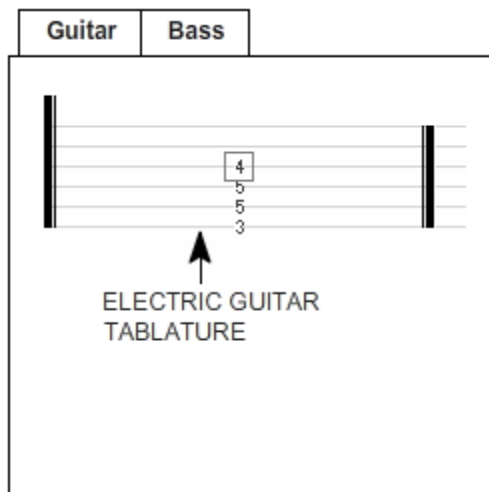


Fig 8: Tabs for switching between tablature.

5. Pre-defined Chords

The user will have the option to select predefined chords from a list, for example, A major, E minor. They press a button to bring up the list and select a chord, see *Fig 9*. It automatically appears on the tablature, with what fret numbers and on what strings, the chord is played.

The user will also have the option to create their own chords, and add them to the predefined chord list for later use.

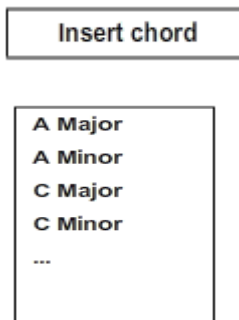


Fig 9: Inserting a chord from a list.

6. Metronome

This can be used by the user before or during playback. It will largely be used during playback, as it helps the user hear if their tablature is written in correct timing. Also, for users learning the tablature, it will help them with learning the timing and keeping in time with the music. A count-in will be used, for example four beats, so a user knows when to come in on time with the start of the music when trying to play along with it.

It can be used without playback. This may be because before writing tablature, it helps the user find the correct tempo they want the tablature played at, by playing their guitar to it or in their head if they are not musicians. It can also be used as just a practice tool for musicians, outside of actually writing any tablature.

There will be a button for the user to turn on and off the metronome and beside that, a text field in which they can enter how fast the tempo is in BPM. See *Fig 10*.

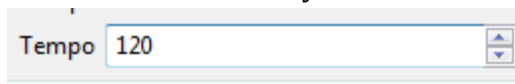


Fig 10: BPM editable textbox. ^{2-[Tux]}

Exceptional Features

7. Scale Generator

If a user has a chord progression they want to write a solo over, this feature allows the user to get and display the possible scales that can be played over it. The user highlights the chord progression on the tablature, and then presses a button to generate the possible scales that can be played over the chord progression. The possible scales are put in a list. The user chooses one from the list, and the scale gets displayed on the same graphical representation of the fretboard that the user uses to tablatourise. The scales will be highlighted differently than the notes used for tablatourising purposes. They can then visually reference this scale when writing the tablature. See *Fig 11* and *Fig 12*.

Generate scales

- Major Scale
- Pentatonic Major Scale
- Blues Major Scale
- Minor Scale
- Melodic Minor Scale
- Harmonic Minor Scale
- Pentatonic Minor Scale
- Blues Minor Scale
- Augmented Scale
- Be-Bop Scale
- Chromatic Scale
- Whole-Half Scale

Fig 11: What a generated scale list from a chord progression would look like.

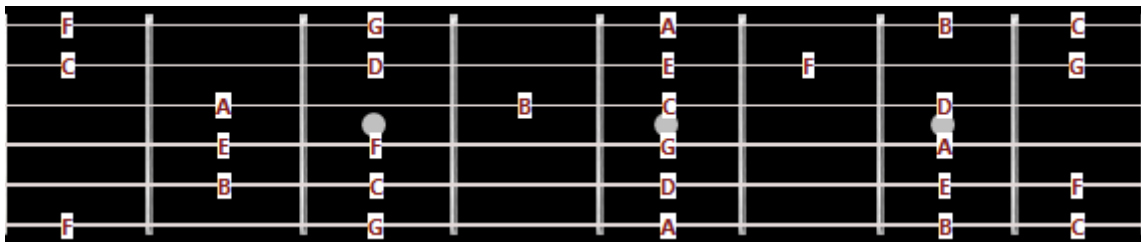


Fig 12: Representation of a scale on the graphical fretboard. 2.[Tux]

8. Drum editor

This will allow the user to tablature drums. The tablature will have a list of the types of percussion on the left of the GUI, for example, hi-hat, snare, etc(See Fig 13). The user clicks on a box in a grid relating to the specific percussion. There will be one box per beat in the BPM. More boxes can be added within a BPM by changing the length of the percussion. The user will do this in the same way they change the length of a guitar note(see *Tablature Notation*).This will allow the user to fit in more percussion in their tablature, for example, with a quarter note they can have four beats of a percussion per beat in the BPM.

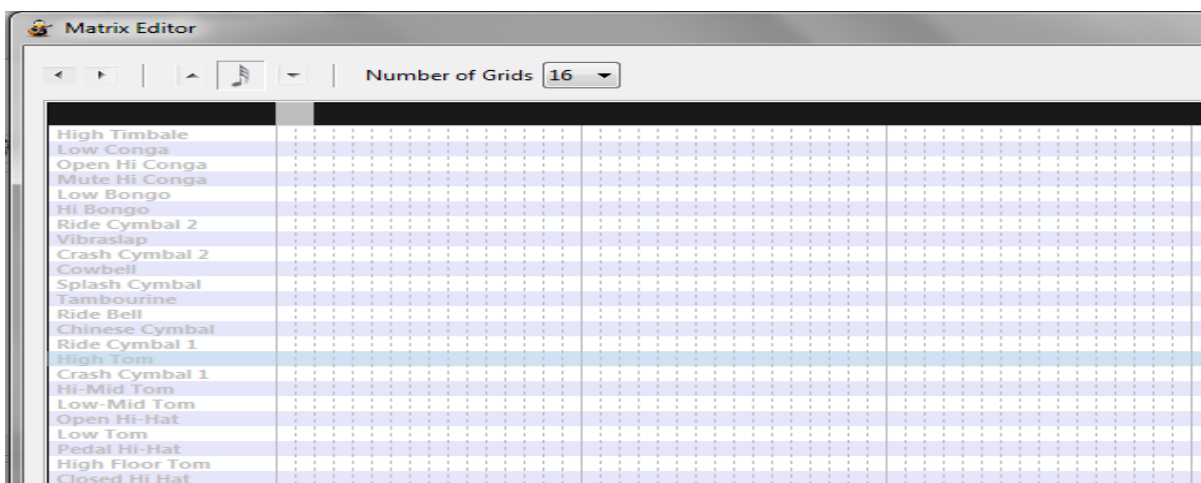


Fig 13: Drum Tablature. 2.[Tux]

Metrics

This project will be deemed successful if a user can carry out the core features documented for this application. The user should be able to write tablature for one electric guitar in the exact way they want it played. That is, they should be able to tablature all of the guitar they need, with what frets and strings are played, and be able to notate how each note is played (i.e. tablature any note effects, if needed, and the duration of the notes).

The user should then be able to playback, through MIDI, the tablature at any time and it should playback exactly as it has been tablatured. That is, it should sound identical to how the tablature written describes it as being played.

Precedent for Application

Similar Applications

The inspiration for this musical editor comes from many existing versions of tablature editors:

1. Power Tab ^{1.[Pow]}

This editor allows multi-track tablature of the electric and bass guitar, and other fretted instruments.

2. Tux Guitar ^{2.[Tux]}

This editor allows multi-track tablature of the electric and bass guitar, and other fretted instruments. It also allows tablature of percussions.

3. Guitar Pro 6 ^{3.[GPro]}

This editor allows multi-track tablature of the electric and bass guitar, and other fretted instruments. It also allows tablature of percussions.

4. NoteFlight ^{4.[Note]}

This is an online editor. It allows multi-track tablature of the electric and bass guitar, and other fretted instruments. It also allows tablature of percussions.

These are just some of the examples of existing tablature applications. All these applications are very similar to use and tablaturise music with. Largely, they are very intuitive to use and an excellent tool for writing tablature. My application is greatly inspired by them.

How my application differs

My application has a scale generator. It can take a rhythm section of the user's tablature, that they select, and it generates the possible scales, as a list, that can be written over the tablature they have written. They can select a scale from the generated list, and it will be highlighted on the graphical fretboard for them to see which notes they can use.

This is extremely useful for soloing, and demands no knowledge of scales from the user. They do not need to know anything about what notes(A, B, G flat, etc.) they are using in their tablature, therefore, they do not need to figure out which scales have the notes that fit over their tablature.

Similar applications only have a list of scales to choose from. They do not generate the scales from the user's written tablature, which is not ideal for helping users with no knowledge to learn scales and is not intuitive.

Bibliography

1. [Pow], Power Tab Editor v1.7 (Build 80), <http://www.powertab.net/guitar.php>, [Accessed 15/10/12].
2. [Tux], Tux Guitar, <http://tuxguitar.herac.com.ar/>. [Accessed 15/11/12].
3. [GPro], Guitar Pro, <http://www.guitar-pro.com/en/index.php?pg=product#/interface>, [Accessed 15/11/2012].
4. [Note], Upgrade to Crescendo, http://www.noteflight.com/commerce/premium_benefits, [Accessed 18/11/2012].