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Learning Traditional Irish Music Using A PDA

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ABSTRACT

A common problem experienced by musicians in traditional music sessions is that of recalling tunes on demand from a large repertoire. Traditional music is largely an oral medium and musicians may recall a name or player of a tune or set, but require hearing the first few notes to start the tune. In this paper, we present our work developing TunePal, a tool that can be used by musicians for the storage and retrieval of traditional music melodies for learning purposes. TunePal is specifically designed to be used by musicians playing Irish traditional music in sessions as it supports the ABC format for musical notation, and was tested on a collection of over two thousand tunes common in traditional music sessions. Traditional music sessions often take place in pubs, where access to a PC is not practical. We have therefore developed TunePal to run on the Pocket PC platform.

KEYWORDS

TunePal, Irish traditional music, mobile computing, ABC notation, music archiving, music tutor.

1. INTRODUCTION

Irish traditional musicians typically know several hundred tunes. Many musicians may play a thousand or more tunes over the course of a lifetime of playing [1]. Musicians typically gather in informal settings known as *sessions* to play together [2, 8]. Sessions take place in shared spaces such as a pub or open house. Often sessions are anchored by several core musicians who may be paid to play, though sessions are usually open in the sense that any musician of appropriate standard can join in [1, 2, 8]. It is not uncommon for participants at sessions to have never played together prior to meeting at a session. This is particularly true of sessions that take place at music festivals. This can lead to interesting challenges as musicians try to find a repertoire in common. Tunes are commonly grouped into "sets" of two or three tunes which are played in sequence. Given such a large repertoire, a common problem musicians face is that of needing to hear the first few notes from a tune or set in order to start the tune. Musicians will often recall the name, composer or player of a tune, but be unable to recall the tune itself.

Current estimates suggest there are at least seven thousand traditional tunes in existence [1]. In the twentieth centaury, there have been several attempts to catalogue the cannon of Irish traditional music [3, 4, 5]. In recent years, the ABC format has emerged as the de-facto language for the storage and transmission of traditional tunes electronically and many large and high quality collections are now available in the format. We have therefore developed TunePal, a program that runs on a mobile device that can store and play tunes in the ABC format. A mobile device is particularly suited to this application due to its small, unobtrusive size. TunePal supports several unique features that make a useful tool for learning and recalling traditional music in a session environment, such as the ability to quickly locate a tune among thousands stored on the device, the ability to play a section of a tune and the ability to speed up or slow down a tune.

2. THE ABC FILE FORMAT

The ABC format was introduced by Chris Walshaw in 1991 [6]. The format was designed primarily for folk and traditional tunes of Western European origin which can be written on one stave in standard classical notation [6]. ABC files are ASCII text files and so can be edited by any text editor, without the necessity for special software. Each file can contain multiple tunes. File sizes are typically measured in kilobytes and this facilitates easy transmission by electronic means. The small size of ABC files also makes them an ideal medium for the storage of tunes on a memory constrained mobile device.

Figure 1. is the tune "Contentment is Wealth" in the ABC format. Each tune consists of a header section and a tune body. The header section contains amongst other fields, the title, composer, source, tempo, key signature, geographical origin and transcriber [7]. As tunes can have several titles, the title field can be repeated for a given tune [1].

```
X:11
T:Contentment is Wealth
R:jig
M:6/8
K:Edor
GFG Eed|BAB EFG|FAF DdB|AFD D2f|gfe edB|BAB ~d3|BdB DFA|GED E3:|
|:ede Beg|bge gfe|dcd Adf|afd fed|ede Beg|bge gfe|BdB DFA|GED E3:|
```

Figure 1: The tune "Contentment is Wealth" in the ABC format.

The tune body contains the notation for the tune. The body encoding supports such features as ornaments, bar divisions, sharps, flats, naturals, repeated sections, key changes, guitar chords, lyrics and variations, though not all these features are supported by TunePal. There is an active and vibrant community supporting the ABC format and a range of tools have been developed for a variety of platforms and purposes. Additionally, comprehensive archives of tunes exist in the format, including a transcription of O'Neill's "Dance Music of Ireland" [3]. This collection alone contains over 1000 tunes. We have tested TunePal using a popular collection of approximately two thousand tunes created by Henrik Norebek [9]. This collection includes many tunes commonly played in sessions. Figure 2 depicts musicians using TunePal at a session.

Figure 2: Musicians compare tunes using TunePal

3. FEATURES OF TUNEPAL

Figure 3 presents screenshots of TunePal. The leftmost screen is the program's main screen. The currently open file is displayed along with the list of tunes contained in the file. Title, alternative title, type, key and composer are displayed in sortable columns. From this screen a user can open a different file, or perform a fast recursive search for a tune. Tapping a tune displays the rightmost screen, displaying the musical notation and controls for playback, transposition, tempo adjustment and so on.
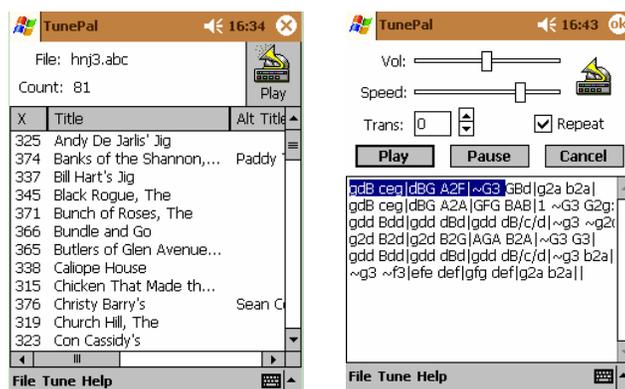

Figure 3: Screen shots of TunePal on Pocket PC

Playback of tunes is the most essential feature of the program as most traditional musicians learn tunes by ear and not from written notes [2]. Developing playback functionality was a particular challenge, given that there is no MIDI support on the Pocket PC platform. Playback therefore is always monophonic and consists of sine wave tones played back. TunePal supports all major, minor, dorian, mixolydian keys. The ABC format supports the notation of "ornaments" such as *rolls*. A roll is notated as a ~ followed by the note followed by the duration (either 2 or 3). A roll in traditional music is a defining characteristic of playback and is used as a technique for separating 2 or 3 notes of the same pitch. TunePal's roll playback algorithm results in realistic sounding rolls that help compensate for the lack of realistic instrument output.

Initially, the entire tune is selected and hence played back, though it is possible for a user to select a sub-section of a tune for playback. This may be required when learning a difficult phrase for example. Additionally, the tune may be speeded up or slowed down. This is achieved by adjusting the default note length. This adjustment can occur during playback as required. Transposition is also supported, so that tunes can be transposed up or down in increments of a semitone (up to a maximum of twelve semitones).

Searching for a specific tune amongst all tunes stored is also facilitated. A user can enter search criteria and the program uses a recursive algorithm to find all matching tunes across all files stored on the machine. Searches can be by phrase, title or any part of the ABC notation of the tune. Searches of thousands of tunes are typically completed in under a second. TunePal was developed using Microsoft eMbedded Visual C++ and runs on any Pocket PC 2002 or later machine. We have released the software for free download from prominent locations on the Internet. To date it has been downloaded over four thousand times [10] [11] and we have received positive feedback and suggestions from users worldwide.

4. FUTURE WORK

Since TunePal was made freely available, much future work has been suggested by users. Some possible areas for future work include:

- Improved support for the ABC format. As TunePal was tested on a specific collection of transcriptions traditional Irish music, the program lacks support for other features such as lyrics, guitar chords and bagpipe music.
- MIDI support for better quality sound output. A third party wave table MIDI player has recently become available, so it should be possible to integrate this into TunePal for more flexible and realistic sound output using a variety of simulated instruments.
- ABC output as stave notation, to facilitate musicians who prefer this format.
- Searching by playing. Many tunes have several names, while others have none at all. A useful feature would be the ability to play a phrase from a tune and have the program match it. Some experimental work has already been carried out using Fourier analysis to transcribe phrases on a Pocket PC.
- The ability to wirelessly share and beam tunes.
- Analysis of the impact on music learning and musician interaction. In the past, the transmission of tunes was largely oral. The advent of the internet and the ABC format has already had an impact on this transmission. Access to archives of thousands of tunes on a portable device which can be used in sessions can facilitate new ways of learning and interaction.

5. CONCLUSIONS

In this paper we presented TunePal. TunePal is an application running on a Pocket PC that can be used by traditional musicians in music sessions for the fast storage, retrieval and playback of melodies. TunePal was tested and works with a popular collection of approximately two thousand tunes which include many of the tunes popularly played in traditional music sessions. TunePal was released for free download from several prominent download sites on the Internet. It has been downloaded over four thousand times and much positive feedback and suggestions from users have been received. Although much work could to be done to improve TunePal, it has proven to be a useful and popular tool for traditional Irish musicians worldwide.

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