Digital Music to Sheet Music

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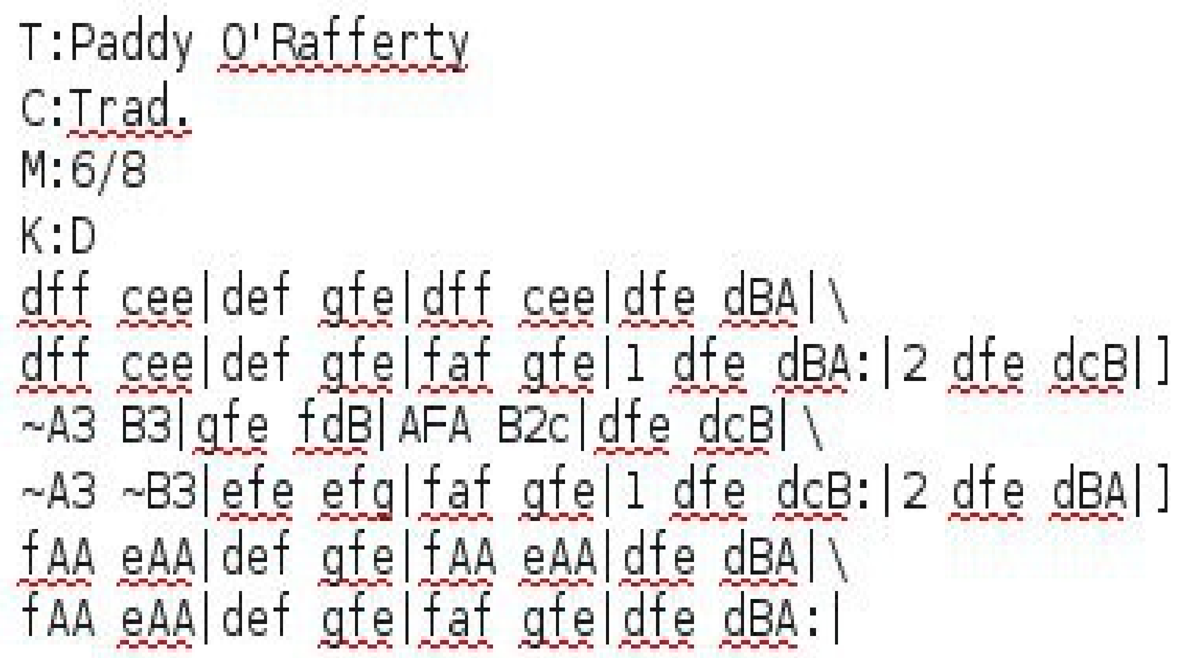
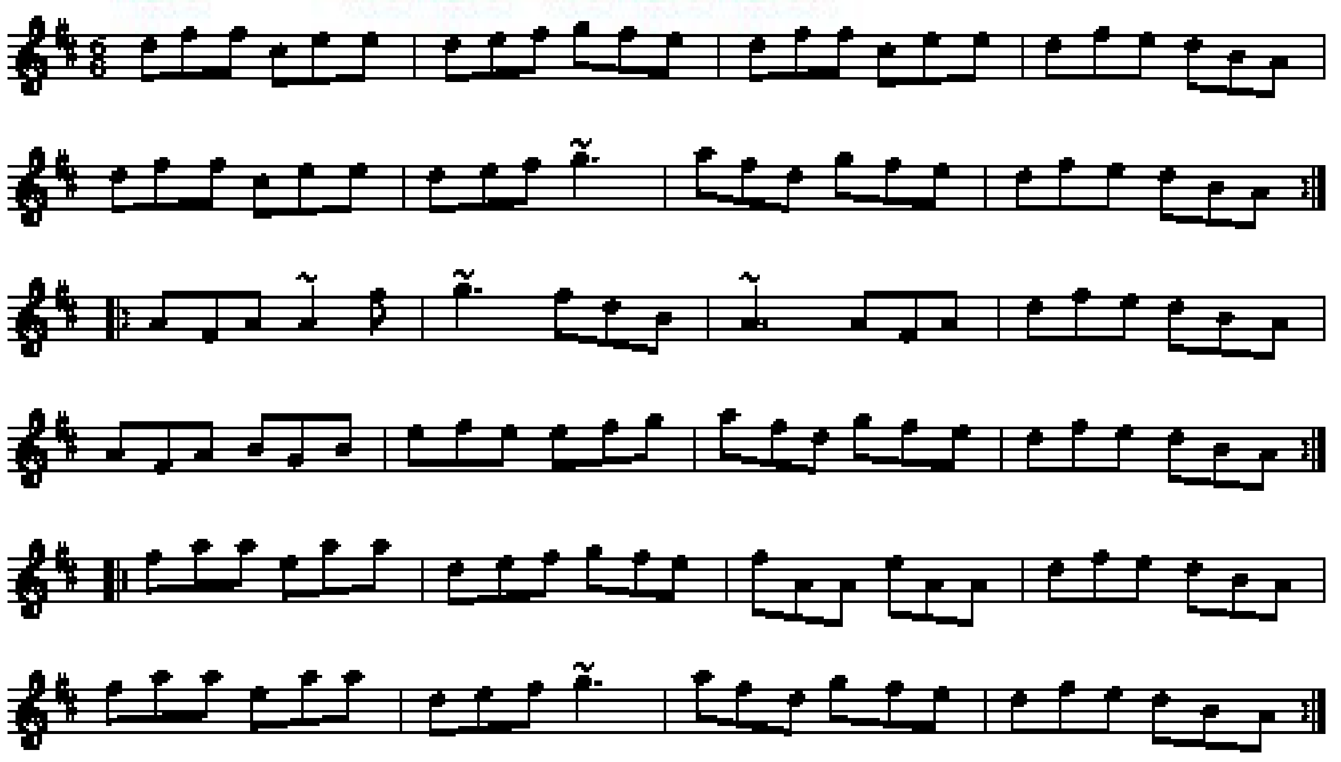
Abstract

Electronic music has been steadily expanding over the past years. Many file formats have come into use, including WAVE, MP3, Ogg Vorbis, and many others. This project hopes to take any one of these file formats, and, based on the pure audio wavelength data (what the computer must see to play the song), convert it to a sheet music version.



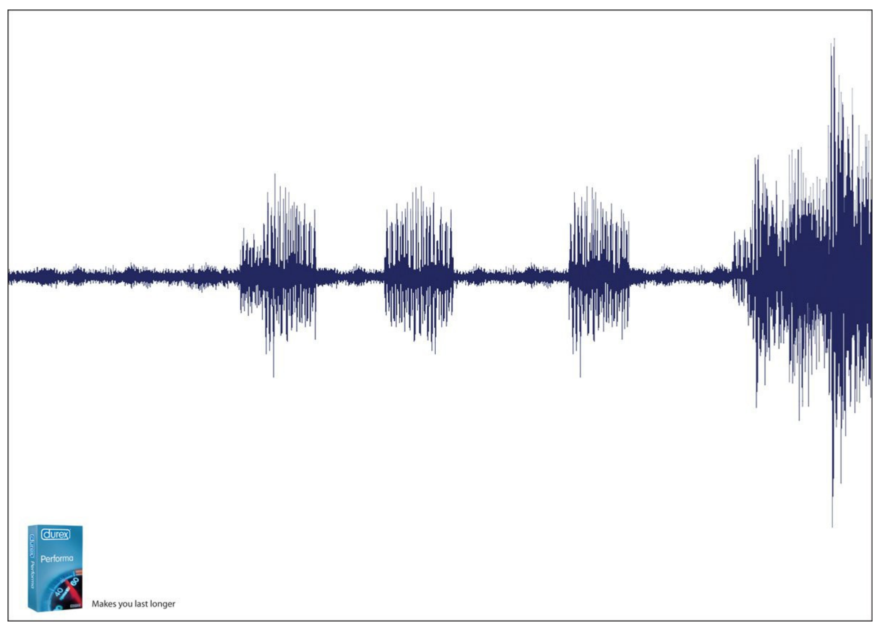
```
T:Paddy O'Rafferty
C:Trad.
M:6/8
K:D
dff cee|def gfe|dff cee|dfe dBA|\
dff cee|def gfe|faf gfe|1 dfe dBA:|2 dfe dcB|]
~A3 B3|gfe fdB|AFA B2c|dfe dcB|\
~A3 ~B3|efe efg|faf gfe|1 dfe dcB:|2 dfe dBA|]
fAA eAA|def gfe|fAA eAA|dfe dBA|\
fAA eAA|def gfe|faf gfe|dfe dBA:|
```



ABC Code → Sheet Music

Background and Introduction

I need to have a good understanding of how C++ works. Also, I need to know musical composition, and how virtual music files are put together. The reason for knowing these things is so I can perform the operations stated above in the fastest time. With bigger music files, the analysis portion of this project could take a long time, so I need to be able to optimize the process. I know some previous research has been done in this area, by some TJ students and other researchers.



A sound wave.

All waves are defined by two things: frequency and amplitude. Basic physics tells us the dynamics of these waves. Sound waves are exactly the same. They travel fast, albeit slower than light, and through most non-vacuum mediums. Computer sound files work the same way, in fact. Energy is converted into data by the use of a transducer. An analog signal is then sent out, which the computer can interpret into sound.

http://img148.imageshack.us/img148/6467/durexperformab9e4fdti5.jpg

Discussion

Offset	Size	Description	Value
0	4	Chunk ID	RIFF
4	4	Chunk data size	8
8	4	RIFF type	WAVE

Offset	Size	Description	Value
12	4	Chunk ID	"fmt"
16	4	Chunk Data Size	16 + *
20	2	Compression code	Int
22	2	Number of channels	Int
24	4	Sample rate	Hex
28	2	Block align	Hex
32	2	Significant bits per sample	Int
34	2	Extra format bytes	Int

Offset	Length	Description	Value
36	4	Chunk ID	"data"
40	4	Chunk size	Depends on file
44	*	*	*