Abstract

The chapter is about lyric recognition in Optical Music Recognition (OMR). Discussion is made in the context of Christian music where the lyric is definitive of the genre. Lyrics are obviously found in other music contexts, but they are of primary importance in Christian music — where the words are as integral as the notation. This chapter (i) identifies the inseparability of notation and word in Christian music, (ii) isolates the challenges of lyric recognition in OMR providing some examples of lyric recognition achieved by current scanning software and (iii) considers some solutions outlining page segmentation and character/word recognition approaches, particularly focusing upon the target of recognition, as a high level representation language, that integrates the music with lyrics. The motivation for this chapter includes the observation that high quality lyric recognition is largely omitted by OMR research, but in the context of a music genre inseparable from the word, it
is vital. Theoretical, practical (typesetting arrangements/singing synthesis) and philosophical reasons motivate a better examination of lyric recognition.

Introduction

Lyric recognition is often considered secondary to Optical Music Recognition (OMR). There is the assumption that the identification of music notation symbols is the primary activity and that the textual elements of the manuscript are secondary both to the music and the OMR process. This chapter observes otherwise, noting that the lyric is definitive of the Christian genre and cannot be isolated from the music, especially in the final representation stage, where capturing notation alone is unsatisfactory. Christian music is always vocal proclaiming a certain message; any music representation language that cannot express this and any OMR process that cannot process this, simply cannot handle Christian music — hence, it is inadequate for a genre that contributes vast proportions to the world of music.

This chapter begins by reviewing the importance of the lyric in Christian music — arguably, without the lyric Christian music would not be Christian music. We consider the development of the genre from its biblical basis to the various choral and hymn forms that developed, including the questionable instrumental music that has been incorporated into the worship context within which Christian music is found.

Second, the chapter highlights some of the challenges that are presented by character and word recognition within the context of music with lyrics. There are a number of complexities including the association of lyrics to various vocal parts (often within the same staff); the spreading of syllables, words and phrases across the page (in a way that is not found within most text contexts); the use of various languages within the lyrics (as exemplified by the music of Taize); the presence of performance directives, guitar chords and other markings that may be confused with lyrics by automatic recognition systems; and the crucial, but implicit, alignment of characters with the music staff indicating their association, and verse text that may be removed from the music line entirely but still needs to be associated with the music (accounting for the rhythm). We continue by illustrating the typical performance that can be expected from a commercial OMR recognition software system (Smartscore) and we see they are limited in the range of phenomena that can be handled.

Thirdly, we consider some solutions to the outstanding difficulties in lyric recognition. We review some approaches to character recognition and page segmentation, where the use of character template matching is actually highly
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