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ISE599 – PAPER REVIEW HOMEWORK

Pitch Spelling: A Computational Model by Emiliios Campouropoulos

This article describes a pitch spelling algorithm which is used for transcribing polyphonic MIDI pitch files into the traditional music notation. The important thing about this computational model is it doesn't need a priori knowledge of key signature, tonal centers, time signature, chords, or voice separation to find the correct pitch spellings.

It is hypothesized that there is a strong relation between enharmonic pitch spelling and tonal structure. Another hypothesis depends on some intervals are more common in a piece than others. For example a perfect fifth compared to a diminished fifth.

The author aims on the comparison of the "line of fifths" model that Temperley's algorithm is based on and the "interval optimization" approach that the proposed algorithm is relied on. At that time, he mentions that the "line of fifths" model is a special case of the interval optimization approach in the sense it provides one possible ordering of pitch intervals. His algorithm depends on 4-level classification that is another way of ordering the pitch intervals. But I didn't find very objective to classify pitch classes like that. One can argue that one scale is more relevant than the other. The main issue here is to determine which ordering of pitch intervals is most appropriate for pitch spelling algorithms.

The algorithm is based on an interval optimization method that takes into account the frequency of occurrence of pitch intervals within the 12 major and 12 minor tonal scale frameworks. It uses a shifting overlapping windowing technique. Basically, the pitch spelling process relies on the notational parsimony and the interval optimization principles during using the windowing technique. Penalty values are introduced for the notational parsimony principle. For each window, all possible spelling sequences are computed and with including the penalty values, the sequence with the lowest penalty value is selected.

From the test results, it is seen that pitch spelling algorithms that are based on an interval optimization process are generally very successful. This technique of a step-by-step transcription by overlapping sections seems similar to the technique of the melodic dictation of a listener. It looks like the author is inspired from a real life experience.

The windowing technique that is proposed in this article seemed like taking too much time during calculation. It may be developed.

In this article, the author compares his algorithm results with only one other pitch spelling algorithm. Some different approaches may have better results.