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Summary review of Pitch Spelling: A Computational Model Cambouropoulos, E

Various approaches to pitch spelling from a MIDI input are examined in this paper. The author also takes into account human cognition and uses music theory to develop effective algorithms. Cambouropoulos' main goal was not actually to develop a pitch spelling algorithm but to test two theories concerning. First, is that there is a strong relationship between tonal structure and pitch spelling which does seem to be quite intuitive. Obviously tonal patterns exist and these can be exploited in determining what the pitch may be. Secondly, he stresses that listeners tend to place higher importance on certain intervals based on their frequency of occurrence. His algorithm has at its underlying basis a way of mimicking the way humans perceiving pitch intervals.

All the algorithms are based on certain criteria in determining how to assign pitch to MIDI data. There are general rules that he utilizes to increase the effectiveness of the algorithms. For example, the spelling of notes should minimize the use of accidentals. This seems to be a fair rule since the frequency of double flats or double sharps is quite low in much of Western music. Secondly, this rule is taken to another conceptually higher level: avoid rare or uncommon intervals such as the augmented or diminished. Specifically the algorithms that he develops are based on two different music theory concepts. Both use a sliding window which seems to be the most effective method in processing the MIDI input. The first one relies on the line of fifths which is basically the circle of fifths in a linear layout. Essentially what this does is give preferential status to the perfect fifth and the perfect fourth among other intervals and less status to the rare intervals with the use of a penalty system. This is based on the interval location within the line of fifths. The author then presents a radically different approach. Rather than using the line of fifths, he ranks the pitch intervals according to their frequency of occurrence within the major/minor scale framework.

The results of the algorithm achieved a very high rate of accuracy in determining the pitch spellings for Mozart and Chopin pieces. A surprising conclusion was that a different ordering of pitch intervals in the line of fifths actually resulted in better results. However, he did concede that there was no such "perfect" ordering for all cases. I found that much of his ideas seemed to stem from Temperley's work and I felt that Cambouropoulos was quite influenced from him. Moreover, the author was very willing to point out the limitations of his algorithms which is not very common in many research papers. In a way, it qualified his work