

Pitch Spelling Algorithms by David Meredith

Meredith introduces a new algorithm called “ps13” and benchmarks it against other pitch spelling algorithms to show that his algorithm does better. Pitch spelling algorithms like his are needed in music information retrieval and musical pattern discovery. A pattern matching search through music requires pitches to be spelled correctly. He also goes into describing the various algorithms he benchmarked against and describes how he conducted his experiments. The algorithm by Longuet-Higgins uses the keyboard position with onset/offset times. The “sharpness” for each note and this indicates the position on the circle of fifths. The algorithm then uses the sharpness between two notes to spell the pitches so that the degree between each note and the tonic isn’t chromatic. Cambouropoulos’ algorithm processes music a window with a few notes at a time. An interval suffers a penalty if the interval occurs less frequently in major/minor scales. Also, double-sharps/double-flats are penalized. He did not have the exact implementation of Cambouropoulos’ algorithm, so he had to use the descriptions to implement it. Temperley’s algorithm uses the three preference rules to spell pitches. The first to prefer events closer on the circle of fifths. The second, to spell a pitch as a diatonic semitone if two tones are separated by a semitone and the first tone is distant from the key center. And lastly to spell the notes so that the notes are a good harmonic representation. The ps13 algorithm is built on Temperley’s algorithm. First, the algorithm computes for the pitch class a letter name. Then the second step corrects errors of neighboring or passing notes as having the same letter name before or after. The second step uses a specified window size to correct the values. A very comprehensive benchmark of the algorithms using various pieces of different composers is given. It is no surprise that Meredith built on Temperley’s algorithm since it performed

second best in the Well Tempered Clavier test to ps13. The Longuet-Higgins algorithm performed 3rd best. Cambouropoulos' had a surprising number of errors. Possibly the real Cambouropoulos may yield better results.