

Cheng Zhi Anna Huang

ISE (CS) 575

Week 5

Anja Volk. "The Generating of Metrical Hierarchies using Inner Metric Analysis" manuscript.

This manuscript discusses an Inner Metric Analysis Model which describes metric hierarchies by the actual notes of a piece, instead of the bar lines. The model is based on “the detection of pulses acting on notes’ onsets and which results in the assigning of metric weights”. During the pulse induction process, the model does not take into account pitch and other features such as “registral accents, density accents, harmonic or melodic changes”. When the metrical hierarchy reflected by the weights corresponds with bar lines, we describe this phenomena as metrical coherence. When they do not correspond, we encounter metric discrepancies and ambiguities. The model features two weight types, “namely the metric and spectral weights, conveying insights into the local and global aspects of metrical organization”.

First of all, by considering the actual notes’ onsets, this model focuses on the metric hierarchy perceived by the listeners, whose judgment towards the metric structure is not biased by the presence of the bar lines, as opposed to the performers. When the metric hierarchy inferred by the model does not match the hierarchy associated with the bar lines, it implies that there is an ambiguity in the interpretation of the period and/or phase of the meter, sometimes arose by syncopation as illustrated by examples of ragtimes.

To determine the pulse, onsets are enumerated as multiples of the smallest beat division. Sets of equally spaced onsets are candidates for the pulses, which are also called local meters. Each local meter is identified with three parameters: “the starting point, the distance between the consecutive onsets of the local meter, and the number of repetitions of the period which equals the number of onsets the local meter consists of minus 1, called the length”. Each onset is given a metric weight by the summation of the length of the local meters that includes the onset, to the power of a variable parameter used to determine the amount of influence of local meters depending on the length. The spectral weight is “based on the extension of each local meter throughout the entire piece”. As a result, spectral weights convey insights on more global aspects of metrical organization than metric weights. The manuscript applies the model to polyphonic textures, and demonstrates how the metric and spectral weights can illustrate how individual voices contribute to determining the metric hierarchy.

This model can be of great assistance to student composers. When we feed a piece of music into the model, on the local level, the model can provide insights on how specific recurring rhythmic patterns may influence listeners’ interpretation on the metric hierarchy. On a more global level, it gives the metric transformation of the entire piece, and may give clues on the divisions of a piece. Some composers first compose without a meter, and later put in the bar lines where they think best reflects the metric hierarchy of the music. And often times, a changing meter piece, can actually be re-barred under a more stable time signature, and this model can help determine the positions of those bar lines.