

The Generating of Metrical Hierarchies using Inner Metric Analysis
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The paper Anja has provided us with serves as essentially a case study and a research presentation. There are many interesting topics covered, but a summary would be too long for our purposes. Instead I will just briefly touch on her work and discuss the implications of her findings. The main topic covered in the paper is the ability to detect the metrical standings of a piece of music, both the explicitly and implicitly defined bar lines. Her system essentially detects these intervals on two levels. The first is a standard inner-onset-interval. She uses onsets to find a generalized fit to the song data similar to the clustering scheme discussed by Dixon for beat detection. A metrical weight is used to suggest the significance of the beat time by considering the number of sub measures that begin at that point. Further information is interpolated by the use of a spectral weighting. The spectral weighting considers the extensions of each measure and how they extend throughout the piece. I would consider this to be similar to the salience calculations in Dixon's work.

The combination gives an interesting insight onto the musical piece without the bias of the initial bar lines. In a sense this is yielding the implied measure rather than the listed one. The topic points out that what is on the sheet music is not always the intended notation. There is something lost in translation sort-a-speak. As noted in the paper when more than one musician was exposed to the same piece with bar positions that did not seem to agree with the notes, they instinctively played the piece without the emphasis placed as the bar lines would request. I think this says something that I wondered myself (not having any formal musical training), the bar lines are spacers not necessarily groupings. It is natural for people to make organization of things. I looked at bar lines as being spacers so that someone writing the notation would have two things. A metronome like time reference and a guide for equally spacing the notations, the idea that this implies where the emphasis of the beat should be comes as an after thought that dictates musical style or genre rather than rule. That is why there can be so many discrepancies to the rules.

Now, ignoring that idea or that I do not know music theory well there is still an important function of such detection. Regardless of the reason for placement visually, the effect of the implied measure is what makes suggestions as to genre. As a result, if you want to make steps towards computer recognition or perception of music classification this type of informational grouping is required regardless of the scored notation. She makes interesting points in her paper with many illustrative examples about how people will follow the rhythm in the metric structure and her system attempts to match this cognitive process as an automated scheme. Although she does not make a real formal analysis of performance, it seems the system does quite well where there are reasonably detectable onset times. The systems week points seem to be centered on the lack of multiple detectors. For example if the rhythm or metrical structure is implied by the pitch the system may not recognize these variations as clues. It seems that this is an excellent foundation to start from and when further checks and balances are considered

and automated analysis is performed could be a key block in many multimedia processing applications.