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Computational Musicology
Assignment 5

1)

Beat tracking differs from onset detection in a few key ways. While onset detection does involve the identification and transcription of musical event in their initial occurrence, beat tracking incorporates a more macro level analysis of an audio file. Although beat tracking is concerned with the identification of onsets, it is also focused on time intervals between onsets and the strength of those onsets across the length of the audio file.

2)

Onset strength can be defined as the overall amplitude level of a the initial instance of a musical event. More specifically in the context of beat tracking, onset strength refers to energy peaks located by the onset function that indicate points of significant onset density (multiple musical events beginning at once). Onset strength envelope refers to predetermined or calculated patterns that relate to how specific tempos and beat patterns occur with strong/weak acoustic and musical events in the audio file. These envelopes make use of onset strength data, as they indicate important tempo and rhythm characteristic in the beat tracking process.

3)

The global tempo estimation is the initial stage in the beat tracking model described by Ellis. In simplified terms, his estimation is found by analysing onset strengths envelopes across an audio file and represents a tempo accurate to the audio files musical content.