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Typically, we define the attack of a sound or note as a time interval in which the sound begins from fixed point and increases to another point (at which time some other phase of the envelope can begin). Onset more specifically refers to a single temporal point at which a sound, note, or rhythmic feature is marked in analysis. The onset is typically marked at the beginning of sound transients, but that is not a universal practice and can be altered depending on applications.

2)

Pre-processing of audio prior to onset analysis is done for a number of reasons. The main rationale for pre-processing is to limit the audio information into specific ranges that are typically ideal for specific types of analysis. One common pre-processing practice is to use multiband filters to divide audio content into defined frequency ranges. This makes certain types of analysis easier.

3)

The process of reduction, when discussing onset detection, refers to the process of transforming the audio into a form which is highly subsampled and is defined by its emphasis on transients in the signal. Reduction functions can be based on fixed signal features in the audio or on probabilities.

4)

Once the functions dealing with pre-processing and reduction have been performed on a given audio file or signal, we can use a method known as peak picking to analyze the onset characteristics of the audio. Peak picking refers to the process of using high amplitude or frequency peaks in the signal to define important elements for analysis. As sharp transients typically manifest themselves as well defined peaks in the signal waveform, they are strong indicators of rhythm and other musical identifiers related to note (and event) onsets.