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Computational Musicology HW Response Reading Summary Questions - Assignment 2

The definition of pitch can greatly vary for a few reasons. First, as mentioned in the article, is that a concept such as “pitch” can only ever exist as a model. Dissonance between the sound object in actuality, and how it is subsequently talked about and described is inevitable. Many attempts have been made to define pitch, some of the most common having to do with a description of a sound wave in terms of it's recognizable patterns. In pitch, there is a fixation on the “ordering” of a sound wave, so that it may be quantified and placed on a scale, relative to other values situated, perhaps, in evenly spaced intervals. As the article mentions, there are more characteristics of a given sound which may be quantified and added to the description called “pitch,” which deal both in the “spectral” plane or the temporal plane, which deal with periodicity of a wave and also temporal cues, respectively.

Place theory essentially deals with the rates of vibrations in a sound wave or physical object which produces one, (ie. a plucked string) and the various ratios which may be measured between the physical characteristics of the object producing the sound and the sound itself. Among some the first people to talk about sound in such a way were Pythagoras in the 6th century BC and Aristoxenos in the 4th century BC. Following them, further discoveries were made by individuals such as Mersenne, who derived the frequencies of every note on “the scale” (what scale is being referred to is unclear in the reading). As discoveries about frequency and vibration of sound advanced, it was found that a string would conceiavbly vibrate in such a way that “reflects a sum of vibrations.” It was Fourier who found that “that any periodic wave can be thus obtained, and with a unique set of (Ak, φk).” This is extremely relevant to modern signal processing in that you can use the Fourier Transform to analyze any complex signal and break it down into its constituent frequencies.

Time theory deals more specifically with the physics of a sound wave, which when broken down into more discreet phenomena, has been discovered to be, as place theory gets at, a sum of many smaller sounds; however the rate at which these smaller sounds overlap is so great that the silence between them is imperceptible and appears to the ear as a single sound. Again this discovery was perhaps first talked about by the ancient Greeks, and in the chapter the aforementioned discovery is attributed to Boethius. It appears that the question of time theory is fundamentally intertwined with the question of what is actually happening inside of a human being when sound is being heard and therefore perceived? Historically, different answers to the question have been proposed, with varying degrees of simplicity and/or complexity. These questions and debates led to an investigation of how sound functions in the ear and brain, which led to further developments which made it easier for people to map out how sound can function inside of a digital or analog system.