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The Soundasaurus: Digital Music Analysis Using Signal Processing Algorithms

Digital music analysis is currently a very important area of study in fields such as anthropology, cognitive psychology, entertainment and many others. The Soundasaurus is a software tool which allows people without a background in programming or signal processing to conduct research in music analysis. It is able to identify the characteristics of beat, duration, key, scale and chords from a digital song file. The program is built upon a library of publicly available signal processing and music analysis algorithms which execute the complex, underlying computations. The Soundasaurus combines all of the individual low-level algorithms into one high-level tool. When users select music or video files for analysis, The Soundasaurus reads the file, and performs preprocessing on the digital signal to normalize it and remove extraneous data. Next, temporal and rhythm information is estimated, and the program stores the length of the piece of music and its estimated number of beats per minute. After that, signal processing algorithms are applied and characteristics of the frequency of the file are computed. Algorithms which extract tonal descriptors are then used to obtain key and chord information. Finally, all the data is displayed to the user, who can then choose another song or sound file for analysis. The Soundasaurus is intended to be used as a building block tool for other research, and to be an easy way to collect data about musical analysis for those without background knowledge of either signal processing or programming.