

## Technology

### sampled audio (sampling)

Converting audio from analog to digital in a 2-step process: sampling (rate) and quantization (bit depth).

### MIDI

Musical Instruments Digital Interface. Protocol for communicating between electronic instruments. Allows instruments to be controlled by hardware/software sequencers.

### waveform

A plot of amplitude against time. Provides a visual indication of the perceptual qualities of sound.

### pitch/frequency

The perception of the relative highness or lowness of a tone. Higher wave frequencies = higher pitch. Measured in Hertz/cycles per second. Range of human hearing: 20Hz–20kHz, falling off with age.

### loudness/amplitude

Related to the audio's volume. Greater wave amplitude (height) = greater loudness. Measured in decibels – 0 is maximum and lower, negative numbers approach silence.

### timbre/tone color

The perceived difference between two sounds of identical pitch and loudness. Refers to the quality of a note that distinguishes different types of instruments. Different shapes of waveform reflect difference timbres.

### sine wave

A smooth repetitive oscillation, representing gentle sloping increase in amplitude then gentle sloping decrease.

### square wave

A wave that reaches maximum amplitude instantly, remains there, and then instantly drops to minimum amplitude (on or off).

### sawtooth wave

A wave that ramps sharply upward and then drops.

### triangle wave

A wave that ramps sharply up, then sharply downward.

### sampling rate

How frequently an analog signal is captured. Doubling the sampling rate from 22,050 Hz to 44,100 Hz will double the file size.

### bit depth

How much data is captured for each sample. Doubling the bit depth from 8- to 16-bit will double the file size.

### dynamic range

The range of volume (between quietest & loudest). Dynamic range: goes from -infinity (silence) to zero (loudest). Sounds above zero clip/distort.

### pan

Altering left/right channels over time. Creates an impression of the sound source moving in space.

### envelope

“wraps” the waveform and allows for the increasing and decreasing of amplitude over time.

## **Practice**

### **music concrète**

A type of music composition that utilizes recorded sounds as raw material. A form of sound collage.

### **stereo**

By creating these auditory experience (placement of sounds into left and right channels) one can create a mental, spatial moving image.

### **mono**

Single channel audio (one microphone / one speaker). This can be duplicated to playback in stereo, but since it is the same sound in both speakers, it is not considered true stereo.

### **acousmatic sound**

Sound that is heard without an action being seen.

### **post-acousmatic sound**

Is a methodology for examining the groups of new technology-based practices that are related to, and indebted to, the acousmatic tradition. The field of technology-based music has expanded—a shift away from the typical conventions of acousmatic and computer music.

### **unity, variety**

Unity occurs when different elements of a piece work together to make a whole. Adding variety can create interest. Adding variety by altering only one auditory element at a time can make it sound familiar and give listeners a sense of gradual evolution.

### **pitch**

In visual arts, tone refers to a color's value—lightness and darkness—which have their implied moods. Higher pitch, like lighter value, may convey positive emotions. Lower pitch, like darker values, may convey negative moods.

### **loudness/silence**

Loud sounds can grab attention. Silence can attract by creating an absence, like the negative space in images. Silence can enrich sounds that come before and after it.

### **good continuation**

Abrupt changes in sound are perceived as a new source coming in, but continuous and gradual changes are perceived as the same source changing.

### **closure**

fill in lost fragments to make the stream seem intact/fluid.

### **figure-ground phenomenon**

Complex sound may be grouped perceptually into separate streams. We primarily attend to one stream at a time, although still aware of other sounds. The attended stream of sound stands out as the foreground, and the unattended streams become background. Layering emotional, contrasting sounds can build tension.

### **harmony**

In music, the pleasing relationship between notes in a chord. The relationship between simultaneous audio units can create harmony or discord.

### **repetition and rhythm**

Can offer a sense of familiarity and stimulate memory. Familiarity often draws attention and thus creates emphasis.

### **stereo/mono/doppler effect**

By creating auditory experiences (placement of sounds into left & right channels; increasing or decreasing volume in a single channel; or increasing then decreasing pitch,) one can create a mental, spatial moving image.

### **headroom**

The amount of volume a channel can take before distorting. The louder the sound, the less headroom it has. For example, if a sound is peaking at -5dB, it has 5dB's of headroom.

### **clipping/peaking**

Another word for distorting. "Clipping" is usually used when a channel has too much volume being sent. In general, you want to give channels enough headroom so that clipping does not occur.

### **room resonances**

Frequency build up differs from room to room. These frequencies can mask the pleasant elements of a sound.

## **Context**

### **mashup**

A digital media file containing any text, graphics, audio, video, and animation, which recombines and modifies existing digital works to create a derivative work.

### **copyright**

Gives authors ownership and rights to the use & sale of their works for the life of the author plus 70 years and for works of corporate authorship to 120 years after creation or 95 years after publication (whichever is earlier).

### **fair use**

Copyright law provides for the principle, commonly called "fair use," that the reproduction of copyright works for certain limited, educational purposes, does not constitute copyright infringement.

### **public domain**

Copyright-free ideas and inventions that can be built upon.

### **digital millennium copyright act**

Enacted in 1998 to stop copyright pirates from defeating DRM restrictions, but has resulted in impeding innovation and chilling free expression and scientific research.

### **creative commons**

Nonprofit organization that provides a licensing structure that creates a balance between the reality of the Internet and the reality of copyright laws to maximize digital creativity, sharing, and innovation.