# Audacity for information professionals

Grainger Engineering Library May 7, 2016 3:00 PM David Luftig (<u>luftig2@illinois.edu</u>)



# Terminology (taken from Wikipedia):

Noise floor - The measure of the signal created from the sum of all the noise sources and unwanted signals within a measurement system, where noise is defined as any signal other than the one being monitored.

Distortion – The unwanted alteration of the original shape of a waveform.

Sample rate - The number of samples of audio carried per second, measured in Hz or kHz (one kHz being 1 000 Hz).

Clipping - A form of waveform distortion that occurs when an amplifier is overdriven and attempts to deliver an output voltage or current beyond its maximum capability.

### **Getting to know Audacity:**

Taken from: http://manual.audacityteam.org/

Audacity	
File Edit View Transport Tracks Generate Effect Analyze Help	
2 · ▶ ■ M M ● 3 I ★ Ø 4 P R -57-54-51-48-45-42-Click to Start Monito	ring) -18-15-12 -9 -6 -3 0 4 -21-18-15-12 -9 -6 -3 0
	2,8▶
9 MME   Microphone (Realtek High Defir   (2 (Stereo) Record   )  ) Speakers (Realtek High Definiti  )	
10 -30 9 30 1:00 1:30 2:00 2:30 3:00 3:	:30 4:00
Audio Track     1.0 Stereo, 44100Hz 32-bit float     0.0      Mute Solo      -1.0      Additional additinal additional additeral additinal additional additinal additinal a	
point label     13     region label	¢
· · · · · · · · · · · · · · · · · · ·	-
Project Rate (Hz):         Snap To:         Selection Start:              end              Length          Audio Position:           44100              Off               0.0 h 0.0 m 0.0.00 s	14
Stopped. 15	Actual Rate: 44100

- Menu Bar
   Recording Meter Toolbar
   Edit Toolbar
   Timeline
   Label Track
- 2 Transport Toolbar5 Playback Meter Toolbar8 Transcription Toolbar11 Track Control Panel14 Selection Toolbar
- 3 Tools Toolbar 6 Mixer Toolbar 9 Device Toolbar 12 Audio Track 15 Status Bar

# **Recognizing Waveforms:**

Taken from: http://manual.audacityteam.org/man/audacity\_waveform.html

#### Good/Undistorted waveform

Audio Trac	10	
Stereo, 44100Hz	0.5-	
32-bit float	0.5	the state of the
Mute Solo	0.0-	
<b>-*</b> -	-1.0	the second care to the second care and the sec
F	1.0	
	0.5-	and a second
	0.0-	
	-	a man of a standard st
-	-1.0	

#### Clipping waveform (the red lines in the track window indicate clipping)

1	X Audio Trac  Stereo, 44100Hz	
I	Mute Solo	
I	ь. <u>р</u> . в	
I		
l		

Severely distorted waveform (as demonstrated by the lack of peaks on the top and bottom of the waveform).

Stereo, 40000Hz 32-bit float	0.5	
Multe Solo	0.0	the second se
L.O.R	1.0	
	0.5	
	-0.5	a second and a second se

## Sample Rate:

Taken from: http://manual.audacityteam.org/man/digital\_audio.html

Analog waveform:



Analog recording media such as a phonograph records and cassette tapes represent the shape of the waveform directly, using the depth of the groove for a record or the amount of magnetization for a tape. Analog recording can reproduce an impressive array of sounds, but it also suffers from problems of noise. Notably, each time an analog recording is copied, more noise is introduced, decreasing the fidelity. This noise can be minimized but not completely eliminated.

Digital recording works differently: it samples the waveform at evenly-spaced timepoints, representing each sample as a precise number. Digital recordings, whether stored on a compact disc (CD), digital audio tape (DAT), or on a personal computer, do not degrade over time and can be copied perfectly without introducing any additional noise. The following image illustrates a sampled audio waveform:

Digital sampling:



# Helpful links:

Audacity manual - http://manual.audacityteam.org/

List of Audacity tutorials: http://manual.audacityteam.org/man/tutorials.html