

Sounds of Open Source

processing sound with sox



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@OpenClipart

Record audio

```
rec -r 44100 -b 16 -e signed-integer audio.mp3
```

Record audio

```
# Thread_queue_size applies to the first  
# input specified after it.  
# In some cases it's not enough to avoid  
# "buffer xrun", try to record video and  
# audio separately.
```

```
ffmpeg -f alsa -thread_queue_size 4096  
-i hw:0 -acodec aac audio.mp3
```

Record audio

→ Self-describing formats



→ Raw or headerless formats

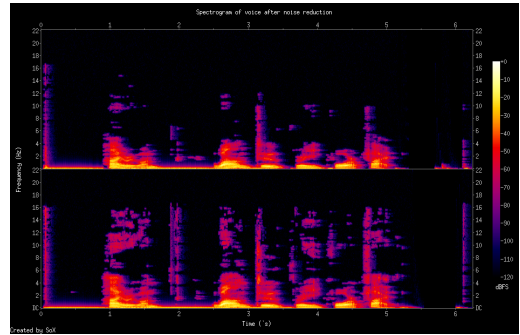
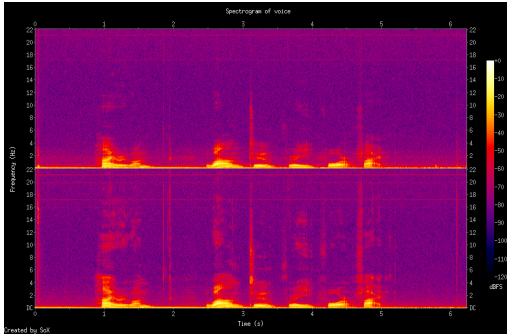


Cleaning up

```
# the noise is always different,  
# try to record it immediately  
# before the actual audio.
```

```
sox noise.mp3 -n noiseprof noise.prof  
sox audio.mp3 output.mp3 noisered noise.prof 0.21
```

Cleaning up



Cleaning up

$$X_k = \sum_{n=0}^{N-1} x_n e^{\frac{-i2\pi kn}{N}}$$

Cleaning up

```
# Voice Activity Detector to trim  
# silence and quiet background noise  
# at the beginning and the end
```

```
sox audio.mp3 trimmed.mp3 vad
```

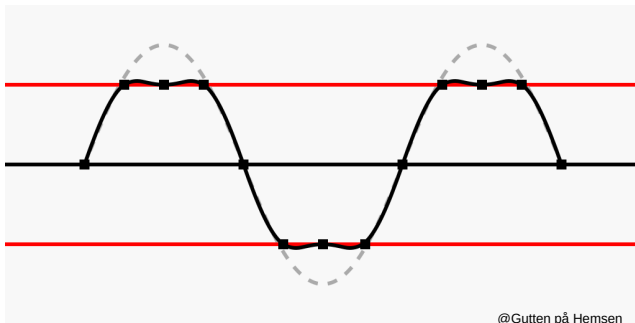
Cleaning up

-v, --volume to adjust volume by certain factor

```
sox audio.mp3 output.mp3 stat
```

```
Samples read:          441216
Length (seconds):      10.004898
Scaled by:             2147483647.0
Maximum amplitude:     0.019642
Minimum amplitude:     -0.019630
Mean    norm:          0.004128
Mean    amplitude:     -0.000000
Volume adjustment:     50.911
```

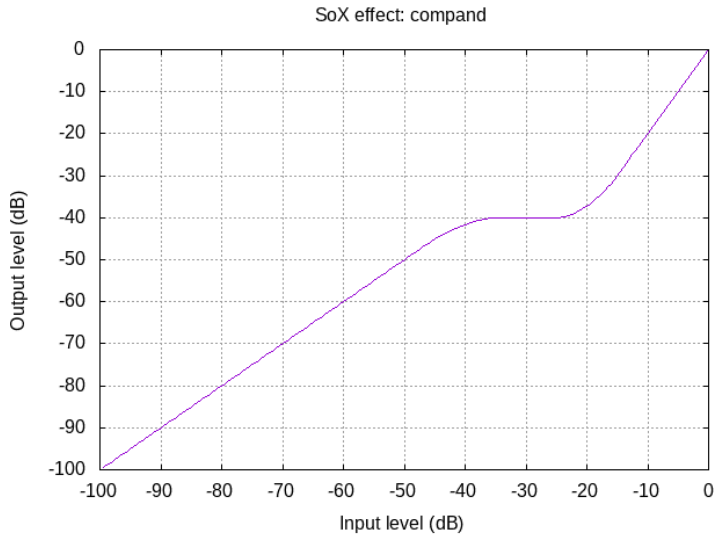
Clipping



Automatic Gain Control

```
sox audio.mp3 agc.mp3 compand \  
    0.3,0.3 \ # attach, decay, time over which  
              \ # to measure for averaging  
  
6:           \ # transfer function, with 6dB soft knee  
  
    0, -80, \    # do nothing below 80dB  
-80,-60, \    # compand 80dB to 60dB  
-60,-40, \    # compand 60dB to 40dB  
-40,-20, \    # etc  
-40 0 0 0.3
```

Automatic Gain Control



Unite and lead

without the volume specified sox can try to
automatically adjust the volume to prevent
clipping, making everything unexpectedly quiet.

```
sox -v 1.0 part.1.mp3 part.2.mp3 concat.mp3
```

```
sox -m -v 1.0 part.1.mp3 part.2.mp3 mixture.mp3
```

Unite and lead

```
sox audio.mp3 output.mp3 \  
  trim 0 30 # cut out from the 0 to 30th second  
  fade 5    # fade in/out for 5 seconds  
  pad 7     # pad with 7 seconds of silence
```

Unite and lead

```
# splice two parts together at position 00:25 with  
# excess/leeway 1 second and half-cosine wave fading
```

```
sox part1.mp3 part2.mp3 mix.mp3 \  
    splice -h 00:25,1,1
```


Effects

add an echo with the delay 500 ms and loudness 0.3

sox voice.clean.mp3 echo.mp3 echo 0.8 0.9 500 0.3

Effects

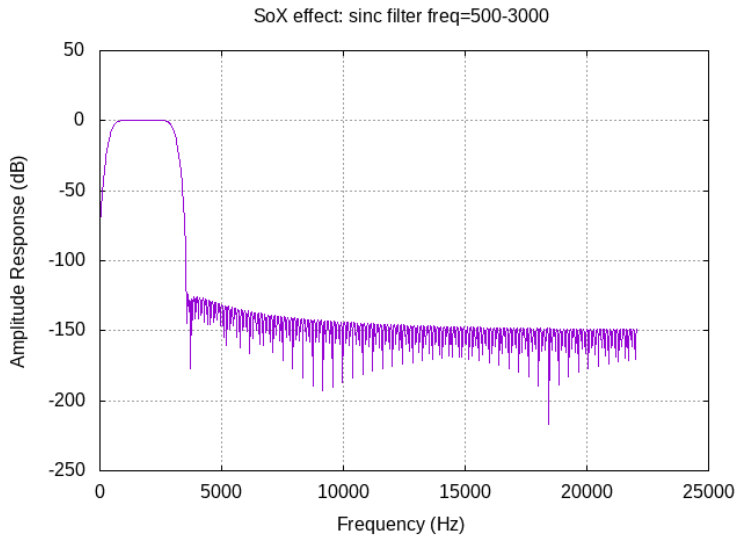
```
# Kaiser-Bessel window band-pass filter
# to generate "phone" effect

sox audio.mp3 output.mp3 sinc 500-3000 vol +3

# Add some clicking noise on top of it
sox -n pinknoise.mp3 rate 44100 \
    synth 10 pinknoise vol 0.01
sox -m -v 1 output.mp3 pinknoise.mp3 phone.mp3
```

Kaiser-Bessel window

Effects



Generating effects

```
# -n says the input is a special "null" file  
sox -n guitar-chortds.mp3 \
```

```
# sine waves for tones of specified note and octave  
synth pl G2 pl B2 pl D3 pl G3 pl D4 pl G4 \
```

```
# delay channels with each tone and mix with fading effect  
delay 0 .05 .1 .15 .2 .25 remix - fade 0 4 .1 norm -1
```

Triangular probability density function (TPDF) dither.



@Gerbrant

Development history

sox.sourceforge.net

Development history

Releases

Tags

on Feb 22, 2015



sox-14.4.2 ...



45b161d



zip



tar.gz

Development history

SoX has had several vulnerabilities listed in the National Vulnerability Database since its last public release in 2015. These vulnerabilities include stack and heap overflows and denial-of-service attacks.

Development history



master ▾



Commits on May 9, 2021

mp3: fix error handling in rewrite_tags() ...



mansr committed on May 9



Commits on Feb 1, 2021


sox.1: fix example for mcompand ...




mansr committed on Feb 1

Questions?

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