Group5_CMLS_HW2

Juce Distortion Plugin

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Juce Distortion

- a non-linear transformation
- different algorithms -> different possible distortion results
- input gain used to controll the amount of distortion
- an IIR filter used to control the tone of the output sound

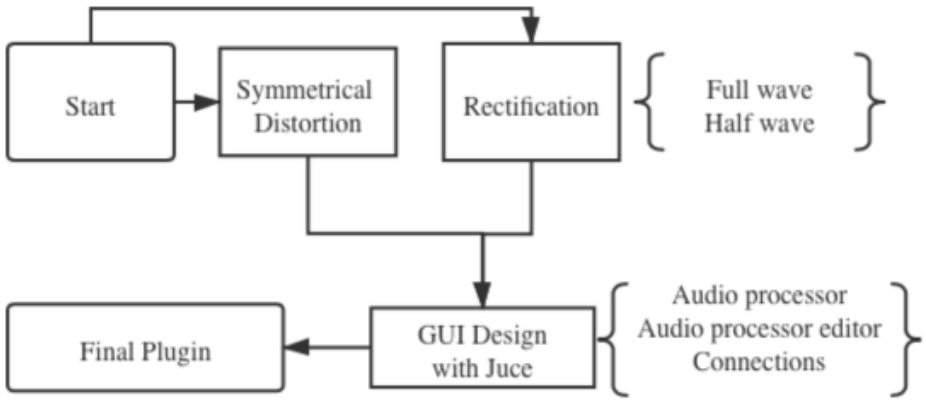
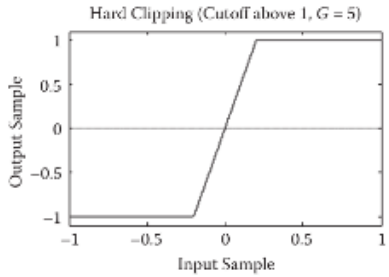


Diagram1 Workflow

Clipping

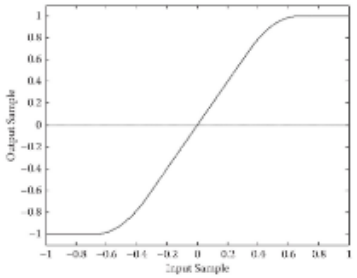
- **Hard**

$$f(x) = \begin{cases} -1 & , Gx \leq -1 \\ Gx & , -1 \leq Gx \leq 1 \\ 1 & , Gx \geq 1 \end{cases}$$



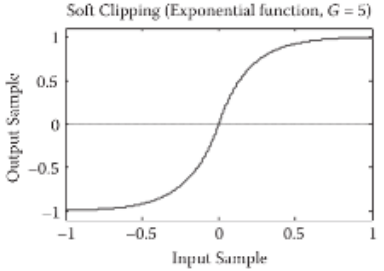
- **Soft - Quadratic**

$$f(x) = \begin{cases} 2x & , 0 \leq x \leq 1/3 \\ 1 - (2 - 3x)^2/3 & , 1/3 \leq x \leq 2/3 \\ 1 & , x \geq 2/3 \end{cases} \quad , f(-x) = -f(x)$$



- **Soft - Exponential**

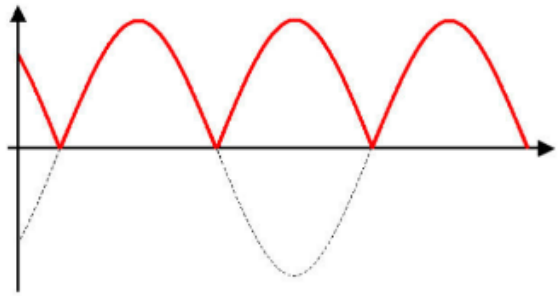
$$f(x) = sgn(x)(1 - e^{-|Gx|})$$



Rectification

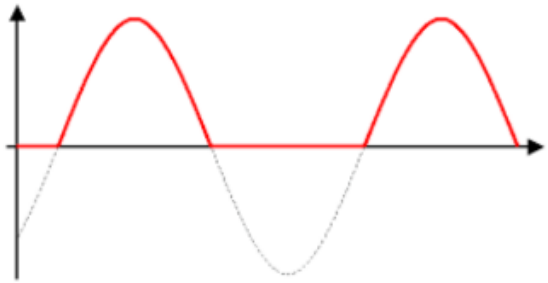
- **Full wave**

Positive half-wave unchanged, negative half-wave inverted

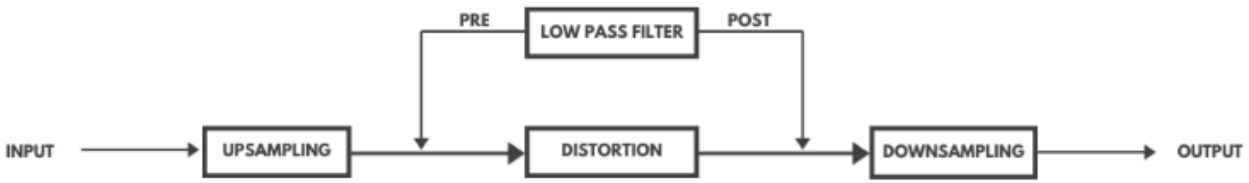


- **Half wave**

Positive half-wave unchanged, negative half-wave omitted

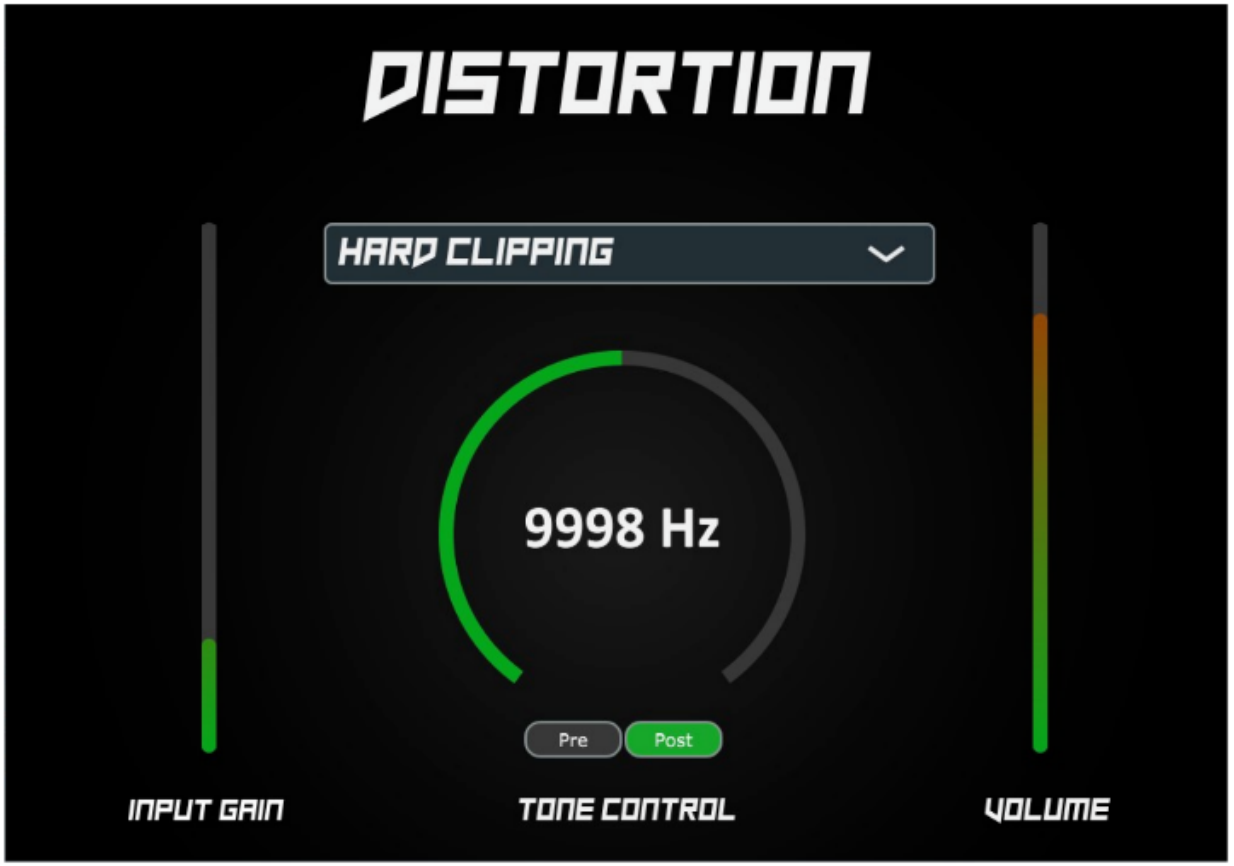


Implementation



Order of operations on the input signal

GUI

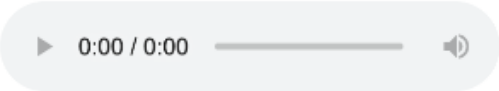

DISTORTION
HARD CLIPPING
9998 Hz
Pre
Post
INPUT GAIN
TONE CONTROL
VOLUME

Testing

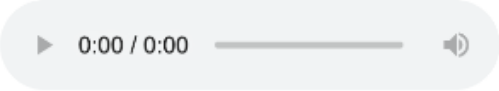
This is the testing part.

Here are some audio samples after distortions.

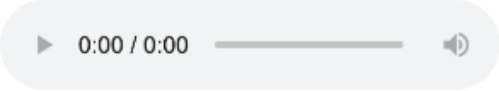
Guitar Sample



Piano Sample Kawaii k11 pre LPF



Piano Sample Kawaii k11 post LPF



Thanks for your attention!