Fire: a Multi-Band Distortion Plugin

Computer Music: Languages and Systems - Homework 2

Group 9 – The Sine of The Times

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POLITECNICO

MILANO 1863

GUI: key points – BAND tab

GUI: key points – BAND tab

GUI: key points – BAND tab

GUI: key points – BAND tab

GUI: key points – BAND tab

GUI: key points – GLOBAL tab

ProcessBlock()

This function within the PluginProcessor encompasses the main steps of the signal flow. In the figure below we have an overview of the structure of the plug-in.

ProcessOneBand()

A general block diagram of the signal path is visualized in the figure below. This is the chain where the signal is processed after dividing into several parts. Each band will be processed by these functions in a different way so as to be able to set parameters for each block.

ClippingFunctions.h
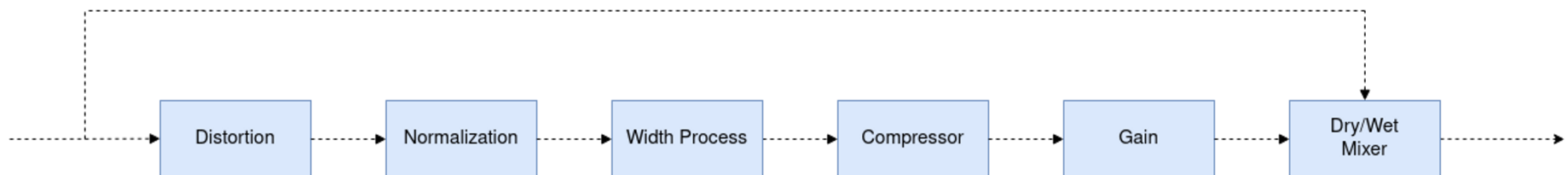
Clipping function: the distortion functions in this code use various non-linear saturation algorithms to create distortion effects. Specifically we have 12 different functions grouped into 3 categories (SoftClipping, HardClipping, Foldback), below we represent some of them:

CubicSoftClipping

$$f(x) = \begin{cases} 1 & \text{if } x > 1 \\ -1 & \text{if } x < -1 \\ \frac{3}{2}x - \frac{x^3}{2} & \text{otherwise} \end{cases}$$

SausageFattener

$$f(z) = \begin{cases} -1 & \text{if } z \leq -1.1 \\ 2.5z^2 + 5.5z + 2.025 & \text{if } -1.1 < z < -0.9 \\ 1 & \text{if } -0.9 \leq z \leq 0.9 \\ -2.5z^2 + 5.5z - 2.025 & \text{if } 0.9 < z < 1.1 \\ 1 & \text{if } z \geq 1.1 \end{cases}$$

with $\quad z = 1.1x$

LinFoldBack

$$f(x) = \begin{cases} ||(x - 1.4)mod(4)| - 2| - 1 & \text{if } x > 1 || x < -1 \\ x & \text{otherwise} \end{cases}$$

LogicClip

$$f(x) = \frac{2}{(1 + e^{-2x})} - 1$$

Video demo

https://www.youtube.com/watch?v=9yMYShyFvHQ

Thank you for your attention!