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11.07.2017

<center>MidiAI

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Short Desciption</center>

This short document should sketch and describe the functionality of MidiAI, **a program designed to be able to adaptively approximate a given finite waveform-signal by controlling a suitable synthesizer or audio effect (or both in combination) via MIDI.**

The Programm is still very in the beginnings so many options are only editable in the sourcecode. (Like MIDI channel (currently it's **MIDI channel Nbr. 5** (whereas we start tu enumerate up from 0))).
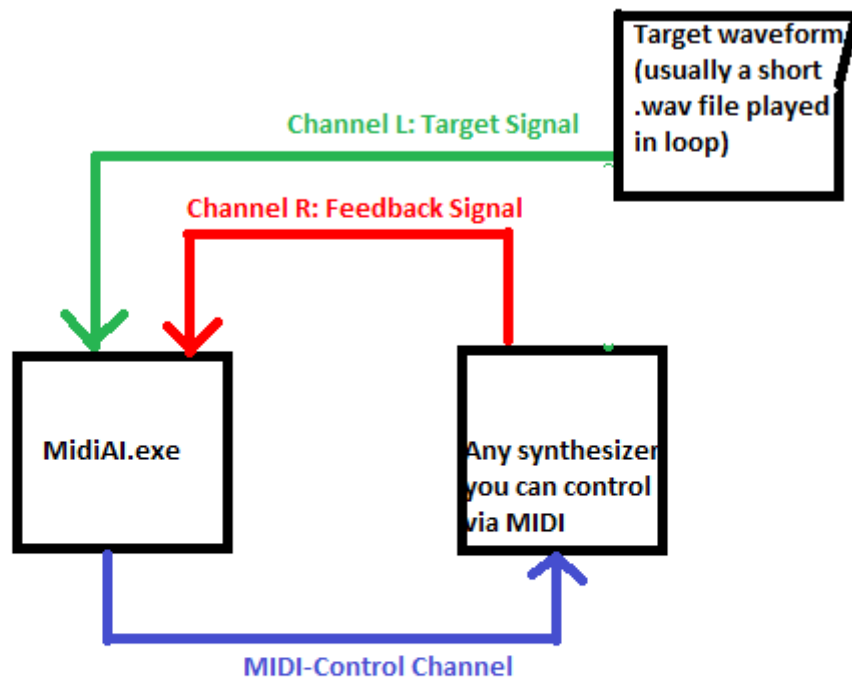

<center>-
User Manual
(for quick use read this)</center>

To use the programm just download the .exe with the required dll's and follow the steps below.

1. Download the folder "**bin**" of the Project to your Desktop.
2. Setup the Audio Routing by deactivating every input device in your preferences except to one (eg. Your speakers). Dectivate every input device except to **stereo mix**. This will be our loopback from the audio-DAW to the MidiAI.
3. Make shure that you've at least six MIDI channels on your computer because we'll use the sixth channel for MIDI-controlling the Synthesizer.
4. The **LEFT Audio-Channel** is for the **target signal input** (yes, we've only mono signals atm.) The **RIGHT Audio-Channel** is the **feedback channel** for the AI to learn (in fact learn !) which MIDI-output produces which Audio Signal.

So if you've setupt everything correctly MidiAI should be able to communicate with your Synthesizer by MIDI and waveform-Audio (via the Stereomix Feedback).

So for make sure everyone is able to setup the program correctly here's a little sketch which should clearify the data stream setup:

To run the programm make shure that everything's setup correctly and you can hear your target signal on the left audio channel.
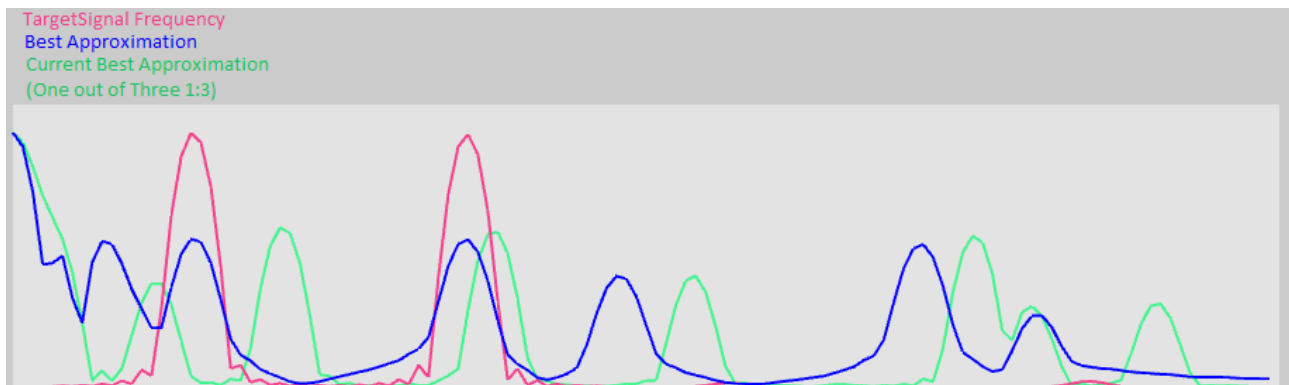
Now run the .exe file!

If everything works properly a window and a console should appear.
Now you can add in addition to the MIDI-notes ten Control Parameters to your synthesizer which are also controlled by the MidiAI.
This is performed by Midi Mapping a Parameter of the Synthesizer. For first control (setup) by the MidiAI just press one of the number keys of your keyboard ("1","2","3"...."0") the MidiAI will send a initial control-MIDI-signal to the currently, for parametrisation prepared synthesizer.

Press Spacebar to start the Programm now !

TargetSignal Frequency
Best Approximation
Current Best Approximation
(One out of Three 1:3)

If everything work's properly the program should displaying the frequencys of the signals like this. Now you should see (and hear) the sinthesizer playing a sequence of notes in regular intervalls. After some times the MIDI Notes and the MIDI-Control-Output should be tuned for that the sythesizer produces a waveform similar to the target-signal.

Well done ! Just capture the MIDI-output-stream and save it in your DAW/Sythesizer-Presets.

And...

That's it.