Combobulator User Guide

v0.9.2 beta version

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System Requirements

Combobulator, as of this version, **only works on Apple M-series chips**. We will be releasing versions for Windows and Intel Macs in the coming weeks.

This version is a **Beta, which means it is still buggy.** Please check known bugs at the end of this document before submitting a bug report. We will be sending updates as they are released - please update as soon as you see these update announcements come in through the plugin interface.

Combobulator can be installed as a VST or Audio Unit. Every major DAW is supported (except for Avid ProTools).

Introduction

Welcome to *Combobulator* by DataMind Audio!

Combobulator **resynthesizes an audio input signal by performing a timbral "style-transfer" on it.** Combobulator uses a revolutionary new synthesis method, **neural synthesis**, to reinterpret your real-time audio through a selected "Artist Brain" (AKA Model, AKA Neural Network). Neural synthesis does not use samples.. The neural synthesis engine synthesizes the output from scratch, based on what each model has "learned" about sound during a process called *model training*.

Each model is trained by our in-house specialists, working directly with each artist to curate and refine the training data, to bring you the highest-quality collection of ethically-sourced models available anywhere in the world. With your purchase of each model, artists make 50% of the gross profit from each sale.

NOTICE: Combobulator will *not* make music for you. The AI models are not designed to faithfully replicate the artists they were trained on, or to make you magically sound like the professional music producer your model is named after. Instead, think of it as a synthesis device that has essentially learned how to hallucinate complex timbres based on patterns perceived in the training material.

While Combobulator functions like an audio effect, it is designed to be played as a neural synthesis instrument. Each model is like a "black box" that contains a universe of timbres that can only be explored by altering the input signal and modulating the latents. Each model can be used to create drums, bass, textures, melodies, and harmonies, all together or individually.

EULA

Our End User License Agreement can be found on our website.

Installation

After purchasing the Combobulator you will need to download the installer package from the DataMind Audio website. Once downloaded, open the .dmg file and you will be greeted with a window containing the Combobulator, artist brains and various presets. To install these, click and drag the files/folder from the left-hand-side into their respective folders on the right. You may be prompted to enter your password, and you may have to double click on the folders to open them and manually drag them.

Once you have completed installing the Combobulator, open your DAW of choice and wait for it to scan the new plugins. This may take a few seconds. If you don't see them show up, make sure both the VST3 and AU paths are enabled in your DAW's settings, then rescan and restart your DAW.

Once the plugin has finally loaded, click on the "REGISTER" button in the top right and enter your username and password. If nothing happens, re-enter your username and password making sure they are correct. Ensure you have a working internet connection while doing this.

Once that is done, you will see your purchased artist brains appear on the left-hand-side.

- **Known Bug:** *If you enter the wrong password during Registration, you will not see any message that says "wrong password"*

Enjoy!

Combobulator Operation Manual
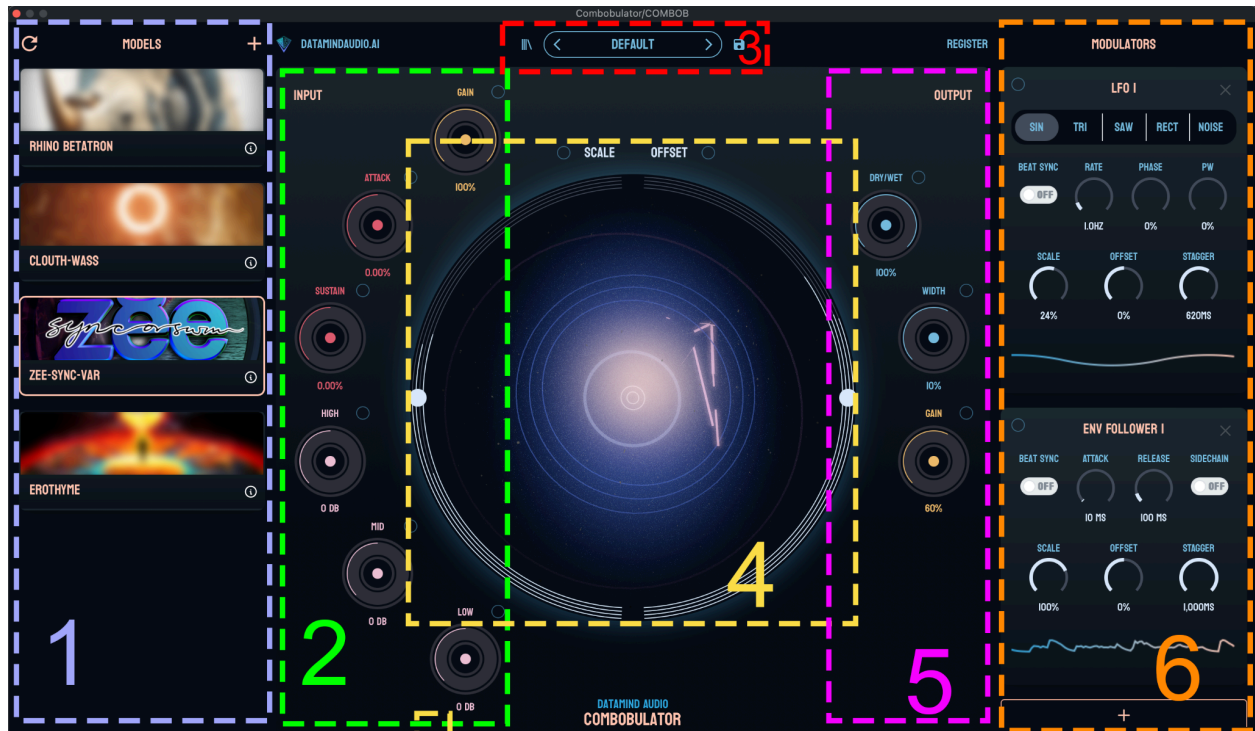
1. Models

Models (AKA "Artist Brains") appear in the left frame of the plugin. Only the model you have selected or are currently hovering your mouse over will appear in focus. To load a model, double-click on it.

To purchase a new Artist Brain, click the plus button on the right to be directed to our store.

Note: *Each new Model (Artist Brain) you purchase pays a generous split to the Artist. Thank you for supporting the Arts with your use of our AI technology!*

2. Input Section

The timbral characteristics of the input signal can radically alter how Combobulator interprets the signal and synthesizes the output. Therefore we have built in several ways to modify the input signal on its way into the neural network. Each knob can be modulated by the modulators.

Gain

This is the gain knob (or "pre-gain") for the input signal.

Attack & Sustain

These knobs control an internal transient shaper. They can be used to summon sharper, more percussive sounds from the neural network, or softer more sustained timbres.

Pro tip: Try modulating these with an envelope follower.

High / Mid / Low

These knobs control an internal three-band equalizer. Combobulator tends to "latch on" to the dominant frequency of the input signal, so if the output sounds too muddy or too bright, you can use these knobs to modify the timbre of the incoming signal so as to alter the model's interpretation.

3. Presets

Presets are at the top of the main window. Presets are not linked to models, so you can try out your preset on any model you like.

4. Latent Scale / Offset

Latents, an Overview

At the heart of Combobulator's neural synthesis engine is the concept of manipulating Latents. Each *Latent* represents a learned "feature" contained in a model, collapsed into a single variable. These features control the dynamics, timbre, and every other aspect of the sound.


Each model has anywhere from 32-64 Latents that come together to synthesize the audio. The first four latents represent the most dominant features in a model. You can scale and offset these latents with the scale/offset faders, and you can see the modulation for the first four latents.
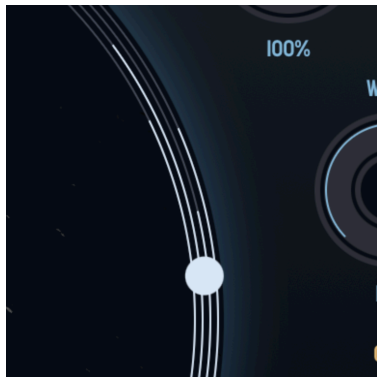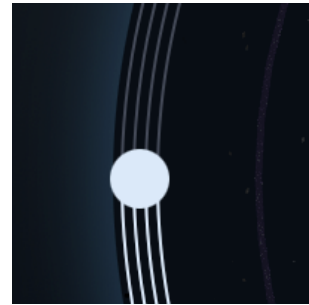

Combobulator allows you to modulate the relative positions of the individual latents using the *Stagger* option inside of the Modulators. (We will also be adding a way to control the Latents using MIDI note values in the near future). Generally speaking, the further apart these latents get, the further the model is pushed to sound different from the input material.

Note: You only see the modulation on the first four latents, but you are modulating all of them behind the scenes.

The Latent Vectorscope
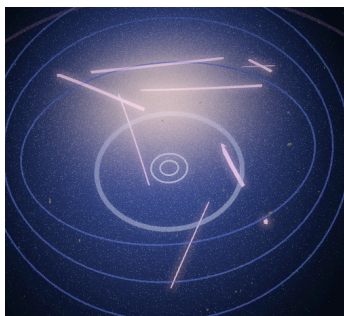
In the center of this circular plane is the latent visualizer, which is a vectorscope for displaying latent phase offsets. Combobulator visualizes the relative distances between latent variables currently active in the neural network, almost akin to seeing synapses fire inside of an invisible brain.
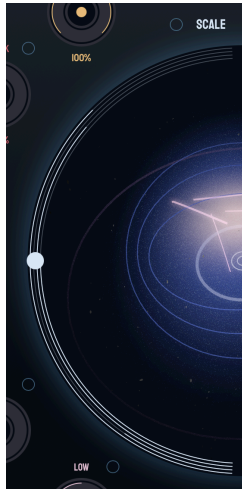
Scale

Scale essentially changes how broadly the neural network's timbres are selected from. Turning *Scale* all the way down will "freeze" the timbre, as the input signal would no longer have an impact on the latents in the neural network. Turning *Scale* all the way up will summon timbres from all across the neural network, maximizing dynamic and timbral variety in the model's interpretation of the input signal.

Offset

Offset essentially shifts where inside the neural network the sound is being synthesized from. Turning this fader will radically alter the resulting timbre, with the outer edges pushing the model into gradually more extreme, experimental, and alien territories.

Each model's offset knob does something a little bit different, because the features represented by each Latent are decided by the machine learning algorithm during the training process. One direction is likely to make the sound brighter and louder, the other direction darker and quieter, as is the natural duality of dynamics and timbre.
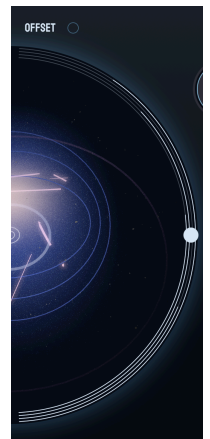
5. Output Section

Dry / Wet

This knob is a self-explanatory fader between the input signal and the output signal.

Width

Width is just like *Offset*, except it applies a gentle offset to the latents used to synthesize the left vs right channel. More difference in the latents between the left and right channel means a more variance between these channels, resulting in a wider stereo image.

Gain

This is the master volume knob. Note that there is an internal limiter immediately after this Gain stage, and may cause clipping artifacts if the gain is pushed too hard.

6. Modulators

LFO

Combobulator's LFO (Low Frequency Oscillator) is not dissimilar to most LFO modulators contained in most synthesizer systems. Combobulator has five LFOs labeled 1-5.

- The rate division can be toggled between **MS or Beat Sync**.
- **Phase** will set the phase relatively to the beat in beat mode.
- **PW** controls the pulsewidth of each LFO shape except for noise.
- **Scale** controls the depth of the LFO's range.
- **Offset** adds a DC offset to the LFO signal.
- **Stagger** only works for Latent **Scale** and **Offset**. This feature adds a delay to how long it takes the modulation to affect each latent.

Envelope Follower

Envelope Follower converts the amplitude of the input signal into a control signal. Combobulator has five Envelope Followers labeled 1-5.

- **Attack** and **Release** controls the slew rate of the Envelope Follower.
- **Sidechain** allows an external audio signal to be sent into the Combobulator to control the Envelope Follower.
- **Scale** controls the depth of the Envelope Follower's range.
- **Offset** adds a DC offset to the Envelope Follower's signal.
- **Stagger** only works for Latent **Scale** and **Offset**. This feature adds a delay to how long it takes the modulation to affect each latent.

MIDI Input

Combobulator only has one MIDI input module. This is technically a sidechain input, as MIDI must be sent into the Combobulator from an external source.

- **Attack** and **Release** controls the slew rate. MIDI note on triggers the attack to start, and note off controls release start time.
- **Scale** controls the depth of the MIDI Input's range.
- **Offset** adds a DC offset to the MIDI Input's signal.
- **Stagger** only works for Latent **Scale** and **Offset**. This feature adds a delay to how long it takes the modulation to affect each latent.

Note: MIDI can currently only be used as a trigger (the notes don't matter), but soon we will be implementing a feature that allows MIDI note values and velocities to control the latent Offset and Scale variables.

Patch Cables

To bind modulators to parameters, simply drag a patch cable between the little circle in the upper left hand corner of the modulator to the circle next to the module name you wish to control.

Control+Click will display all the active modulations and allow you to adjust the relative depth.

To remove a modulation cable from a parameter, delete the modulation module and all connections will disconnect.

Bug Report / Help

Please report bugs on our discord channel: https://discord.gg/KaDdaKbg

If you would like help or personal support of any kind, please reach out to us at support@datamindaudio.ai

Known Bugs v0.9.2

- **Right now the interface is VERY buggy. We are re-coding this and should be able to issue an update before the end of January 2024. This will fix the majority of the UI bug issues detailed below.**
- Error "Library Update Failed: Storage Error" appears every time the plugin loads or the models are updated.
- Sometimes the UI gets slow, with the animation frame rate starts slowing down. To fix this, close the UI window and re-open.
- If you press "escape" it causes Ableton Live to crash while dragging patch cables.
- Plugin window goes blank on "delete" key sometimes.
- The Scale and Offset faders frequently strobe and glitch visually.
- Control+Click on the modulation-bound parameters will sometimes ignore mouse clicks or make the changes affect all knobs at once.
- Sending too much volume into the Combobulator sometimes evokes silence. This has to do with models - if you send a high amplitude that's far beyond the scope of what it's learned, it tends to act up.

About DataMind Audio

DataMind Audio was co-founded by Rob Clouth (Lead Programmer), Ben Cantil (Production), Catherine Stewart (Managing Director), Zack Zukowski and CJ Carr (Dadabots) (Lead Researchers). We are a small company created by musicians for musicians, making AI-powered music production and sound design software that empowers artists and inspires new ideas.

Based on the RAVE technology developed at IRCAM in the STMS Lab.
Authors : Antoine Caillon, Philippe Esling.

Acknowledgements