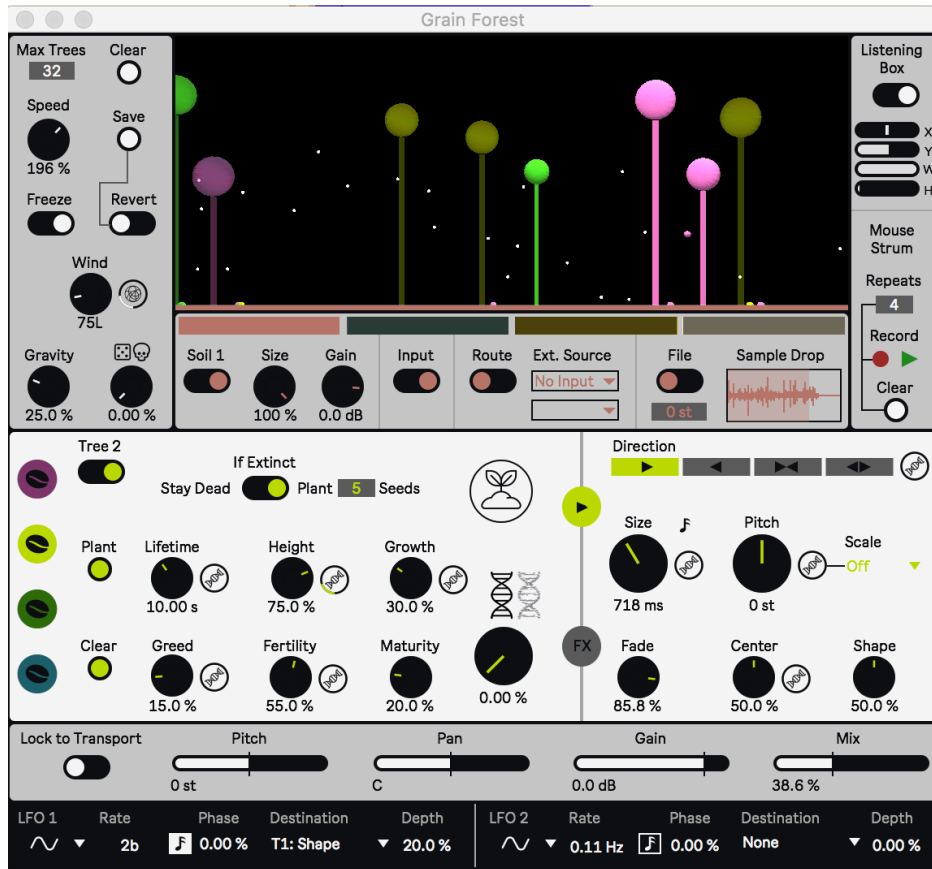


Grain Forest User Manual

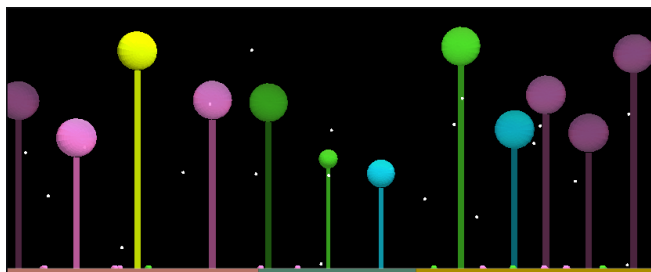


Grain Forest is a granular synth and effect. The granular synthesis is driven by an evolutionary forest simulation. Each tree represents an independent grain and has its own DNA. For each tree species, you can determine how much the DNA modulates each parameter. As the trees breed and share their DNA (or mutations occur) the modulations of subsequent generations changes. This gives Grain Forest a literally evolving soundscape.

To install:

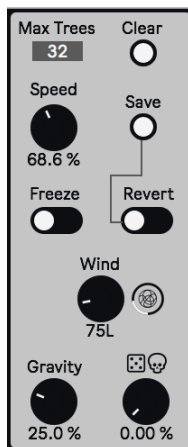
Unzip the folder and drop the folder called "Grain Forest" in this exact location in order for presets to load correctly: *ableton/user library/presets/audio effects/max audio effects*
For best results or if you are having issues, make sure you are using the latest version of max/msp. You do not need to have a license if you are using Live suite. Download the newest version here: <https://cycling74.com/downloads> and once downloaded go to the ableton Preferences > Library and set the newly downloaded version of max to the one ableton should use. (Also you can try to see if it works fine with your bundled version first).

The Simulation



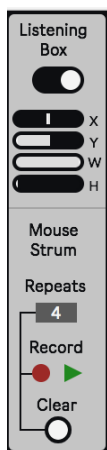
In the top center of the device the forest is visualized. Each tree species (representing a unique granular synth and FX chain) has its own color and may breed with other trees of the same species. The trees breed

by releasing pollen (the white dots) in the air, which are moved by the wind and gravity. If a piece of pollen crosses a tree, the tree and the pollen may create a new seed crossing their DNA at random (more about DNA as we go along). As mentioned, each tree represents one grain or voice playing back a sampled piece of audio. The trees sample the audio from the “soil” they grow on (the colored horizontal bars under the trees). Each soil can have its own unique audio mix from one or more sources. More about that later. Therefore, each tree species can have unique playback and FX settings as well as modulations (informed by their DNA) and these trees eat (record/sample) from one or more sound sources represented as different soils. Each tree body visual also then represents a buffer of audio, and the time or sample position of that buffer correlates to the Y axis of the tree (the bottom of tree being the beginning of the audio it recorded and the top being the end or the current recording position).



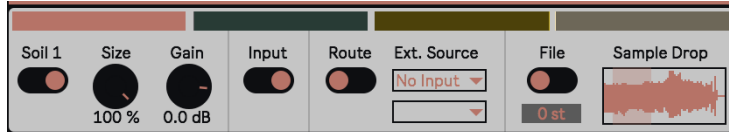
Here we have the main settings for the simulation. You can set the maximum number of trees allowed to exist in the simulation at any moment. You can clear all trees and seeds in the forest. You can control the speed of the simulation. You can save the current state of the forest, to be reloaded when a preset or Live set is loaded. Or if the revert parameter is on, then the save state is reloaded every time Live’s transport is activated. CAUTION: though the saved state of the forest is recalled, the audio it recorded is not! Below this, you can control the wind direction and intensity in either direction. The small knob next to it adds chaos to the wind. You can also set the gravity intensity and the to the bottom right you can set the likelihood that a tree will die randomly before its life time ends.

Playing Back Trees



This section controls how trees will be played back. By default the listening box is on. The listening box designates an area on the forest simulation, it is shown as an opaque box or line depending on its position settings (XYWH). Any tree in contact with the listening box is looped indefinitely. The vertical area of a tree covered by the listening box sets the possible start positions of the recorded audio that the grain playback could start from. Therefore, a height (H) of “0” (which forms a line) sets a static start playback position. The other way to playback trees is by clicking and dragging the mouse on the forest simulation visual. Any tree that is underneath the mouse when it is clicked will be played back repeatedly. The number of repeats is set by the repeats parameter. You can also record and playback mouse clicks. Each time you press record, a new loop is added to the total recording, unless it is cleared.

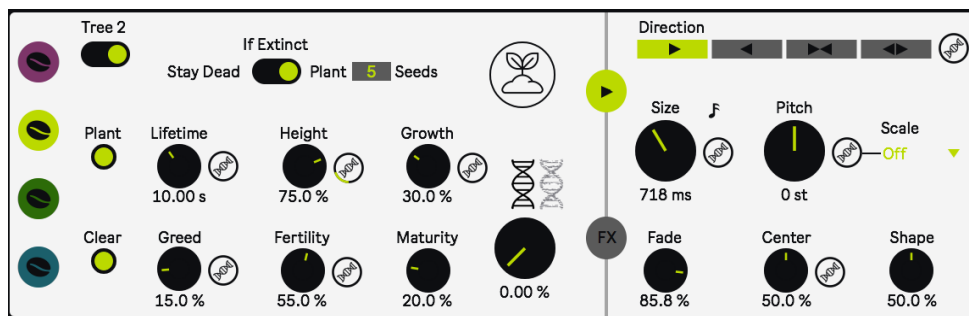
Soil



You can create up to 4 different kinds of soil. Trees grow and sample the soil that they sit on top of. Each soil can have its own unique audio mix

from various sources. In this section you can enable or disable a soil. You can change how much size of the forest floor it takes. You can control its gain and set which audio sources are added to its mix: Input is the audio coming directly into Grain Forest in the track it's on. You can also route audio from another track in Live. The final option is to playback an audio sample (file) of which you can select a range to playback and transpose the pitch.

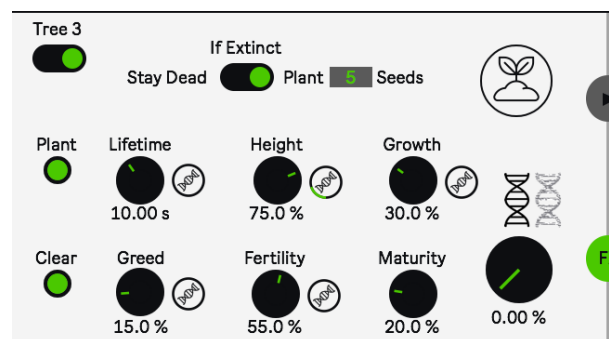
Tree Species



In this section you can control each tree species. There are up to 4 different species of trees which can have their own playback and FX settings and

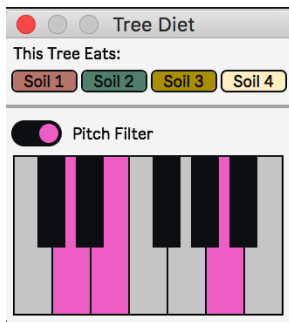
genetic variances (modulations). The colored buttons on the far left select the different tree species. Each tree has three parameter

sections. The left section has controls for the tree itself. You can activate a species, plant a new seed or clear all of its trees and seeds. You have a parameter which sets the behavior that happens if a tree becomes extinct (if all its trees and seeds die). They can either stay dead or plant a set amount of new seeds. Below this you have parameters for lifetime (how long the tree lives), the maximum height and its growth acceleration. Greed sets how much space a tree needs to be able to sprout from a seed. If the trees greed is higher than the sum of the greed of all the trees in its vicinity (its neighbors) then the sprouting tree will kill its neighbors.



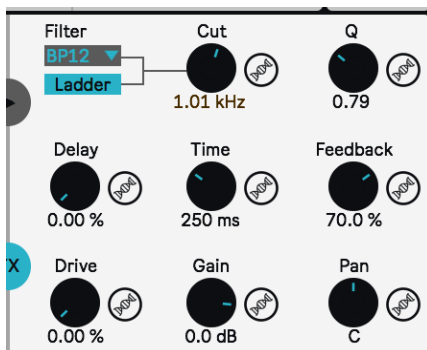
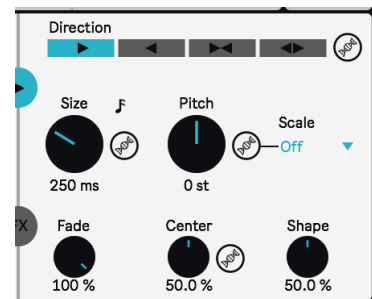
Fertility sets how often a tree releases pollen and how likely it will create a new seed when pollen from another tree of the same species crosses it. Maturity sets the point in the tree's life when it can start creating pollen and seeds. The bottom right knob sets the mutation probability (the likelihood that a mutation will occur when DNA is crossed between parents of a new seed).

Before continuing I'd like to clarify how DNA, mutations and modulations from DNA (genetic variance of parameters works). Many of the tree parameters have a smaller knob to the right of the bigger knob with a small DNA symbol in the center. The smaller knob sets the amount of genetic variance the associated parameter can have. Greater genetic variance means greater possible modulation that a DNA can apply to the parameter. So when two parent trees create a seed, the randomly cross their DNA. Each value of the DNA sequence is associated with a modulation to specific parameter. So by mixing the DNA, the modulation amounts for the tree parameters are mixed. And the small genetic variance knobs next to each parameter scales each of those modulation values accordingly. The mutation probability sets the likelihood of a DNA value being set to a random value when it is mixed between parents.



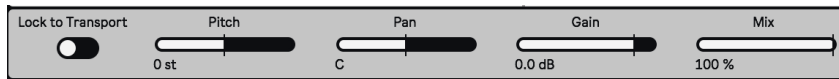
Continuing with the picture above, the button with the icon of a sprouting plant opens a small popout menu with the tree diet settings. Here you can set which soil type the tree species can sample from (eat and grow from). Optionally you can also filter notes that a tree can eat. This is done through pitch detecting the fundamental of the source and seeing if that pitch matches any pitches enabled on the keyboard if the pitch filter is active. This is a very rudimentary process.

On the right side are two settings menus that can be accessed. The top one is the playback settings. You can set direction, grain size, and transpose the pitch/speed of playback. If you apply genetic variance modulation to the pitch, you then have an option for applying a specific set of intervals (a scale) to that modulation. You also can drop scala tuning files (.scl) directly on the scale dropdown menu which allows you set a custom tuning system or scale to the pitch modulation (such as microtonal ones, etc). At the bottom you can set the fade window shape for the grain playback, including amount, the center of the peak and the curve/shape (from more open to more sharp and small).



The other right side menu is the FX menu. In here you have a filter (both standard biquad and a ladder filter, the ladder is more cpu demanding) with various filter types. There is a simple delay, overdrive, gain and panning.

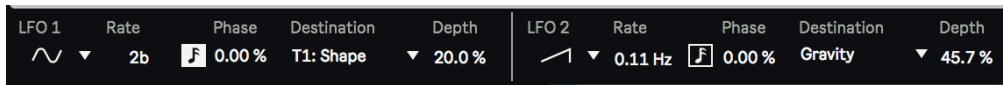
Mix



Below the trees is the main mix. If lock to transport is enabled then the trees only

playback and the forest simulation only runs when Live's transport is running. You can transpose all of the tree itches, pan, gain, and control the wet/dry mix (the wet mix is the audio coming directly into Grain Forest).

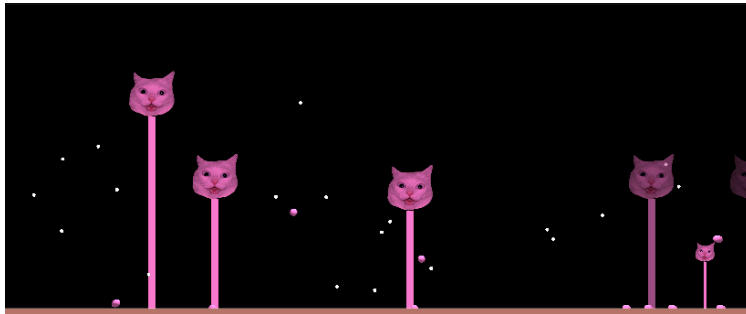
LFOS



At the very bottom are 2 basic LFOs

which you can send to one parameter in the device each. In addition to the basic LFO waveforms, there is an option at the bottom for perlin noise.

Custom Tree Tops



You can change the image of the tree tops by dragging and drop an image file on the forest simulation visualization. NOT the visualization of the popped out Grain Forest window, but the minimized visualization you see on the track's effect chain when you first add the Grain Forest device.

I hope you enjoy this device! Please email me if you have bugs or other issues:

dillonbastan@gmail.com

More: <http://dillonbastan.com>