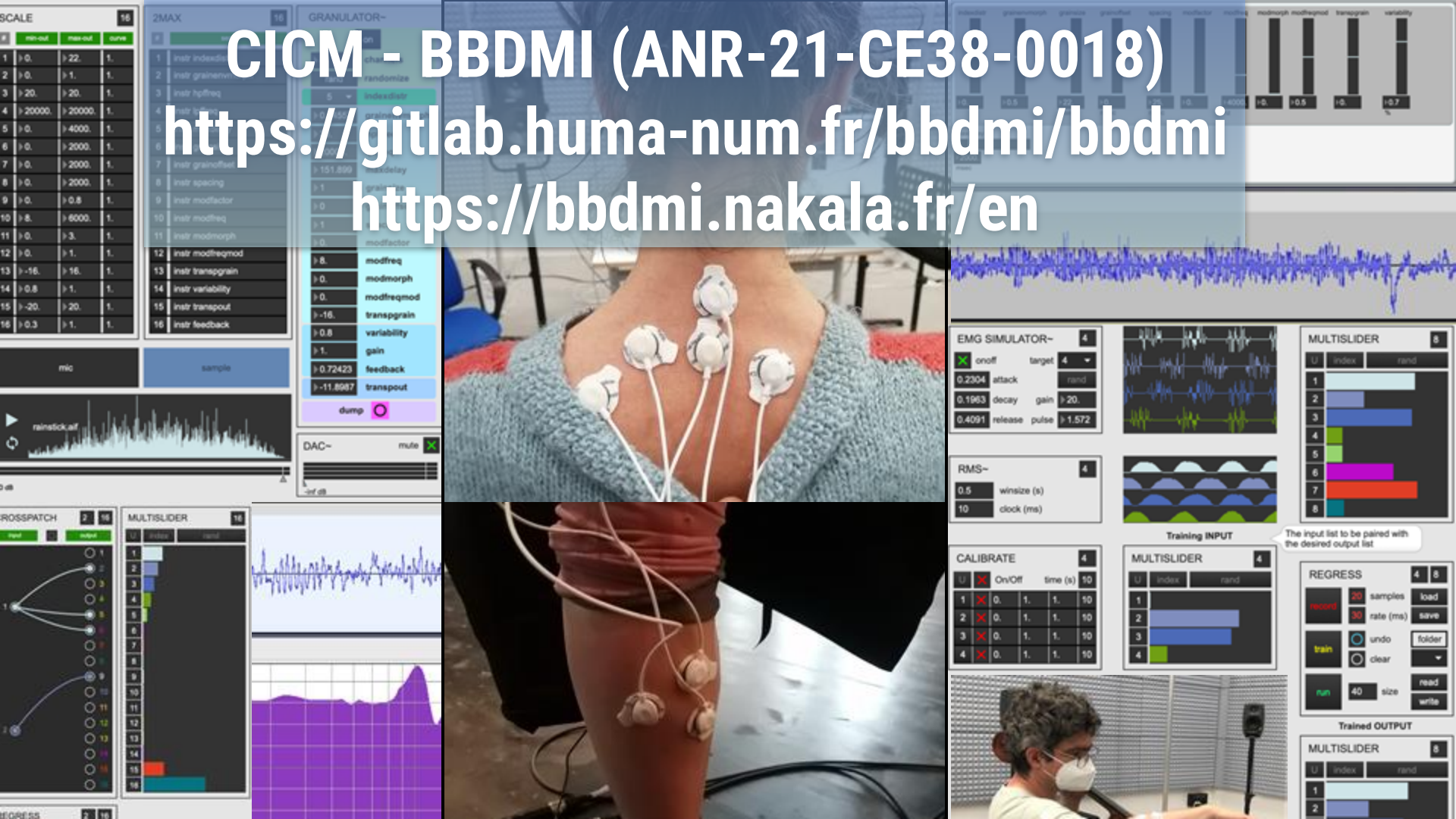
FUNCTIONAL AMBISONIC GRANULATOR

David Fierro - Alain Bonardi
CICM - BBDMI (ANR-21-CE38-0018)
https://gitlab.huma-num.fr/bbdmi/bbdmi
https://bbdmi.nakala.fr/en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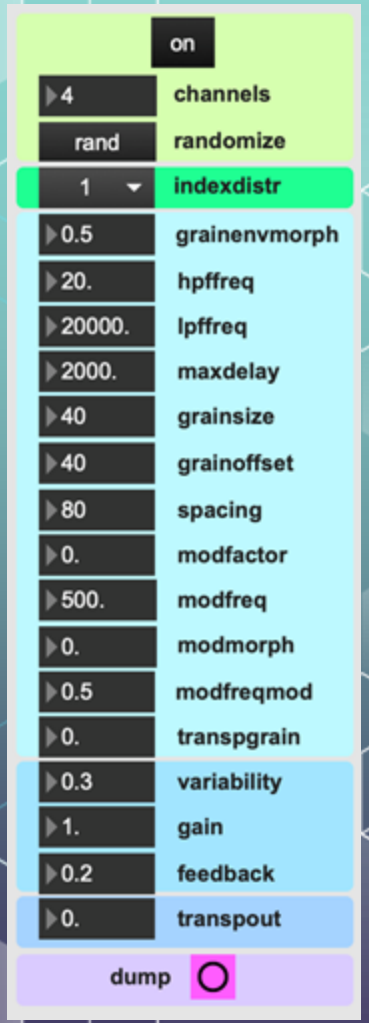
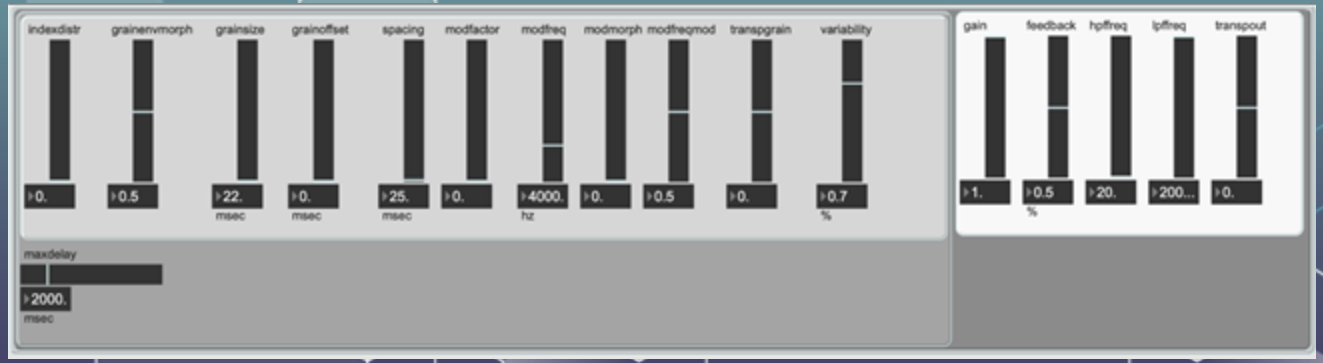


GUI'S


Multi Granulator
granulator
Grain
GrainEnvelope
indexdistr grainenvmorph grainsize grainoffset spacing modfactor modfreq modmorph modfreqmod transpgrain variability
0 0.5 22msec 0msec 25msec 0 4000hz 0 0.5 0 0.7%
maxdelay
2000msec
loop
gain feedback hpffreq lpffreq transpout
1 0.5% 20 20000 0


indexdistr grainenvmorph grainsize grainoffset spacing modfactor modfreq modmorph modfreqmod transpgrain variability
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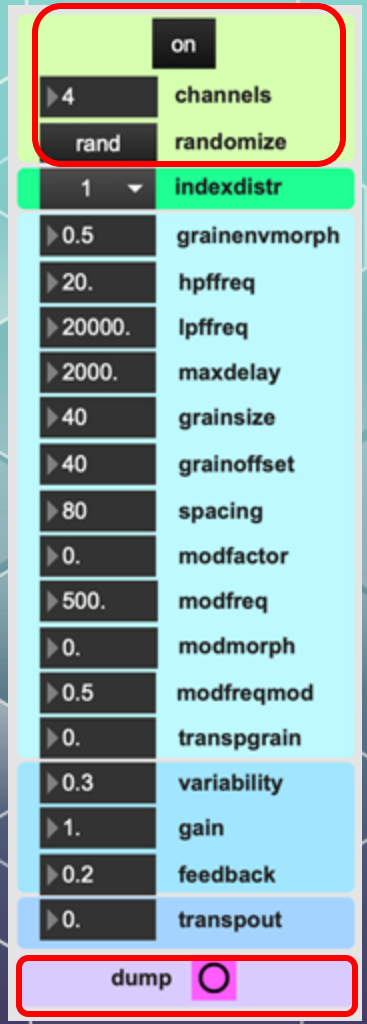
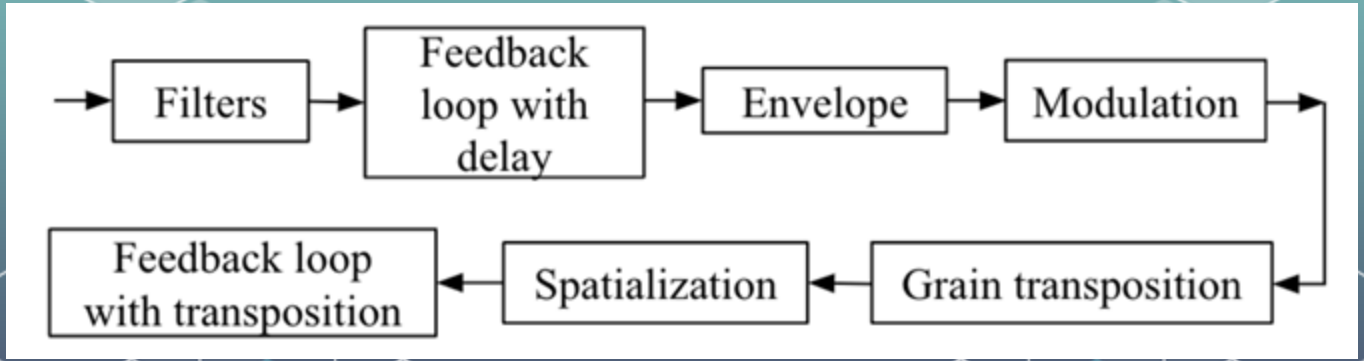
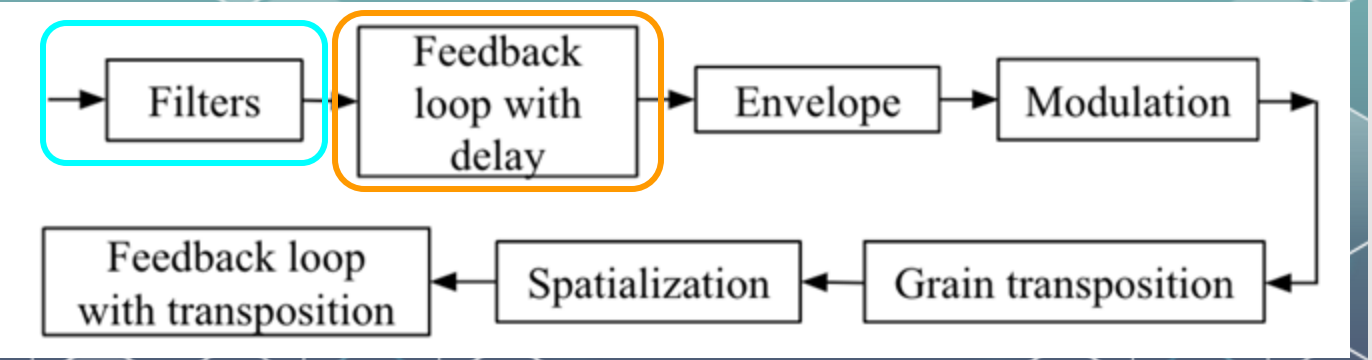
maxdelay
2000. msec
gain feedback hpffreq lpffreq transpout
1. 0.5 % 20. 200... 0.

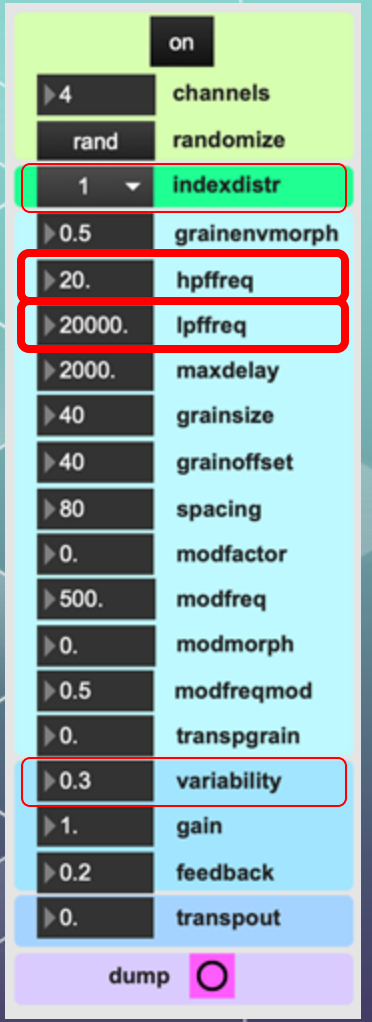

on
4 channels
rand randomize
1 indexdistr
0.5 grainenvmorph
20. hpffreq
20000. lpffreq
2000. maxdelay
40 grainsize
40 grainoffset
80 spacing
0. modfactor
500. modfreq
0. modmorph
0.5 modfreqmod
0. transpgrain
0.3 variability
1. gain
0.2 feedback
0. transpout
dump

Simplified diagram



Filters


Filters
Feedback loop with delay
Envelope
Modulation
Grain transposition
Spatialization
Feedback loop with transposition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modfreqmod
0.
transpgrain
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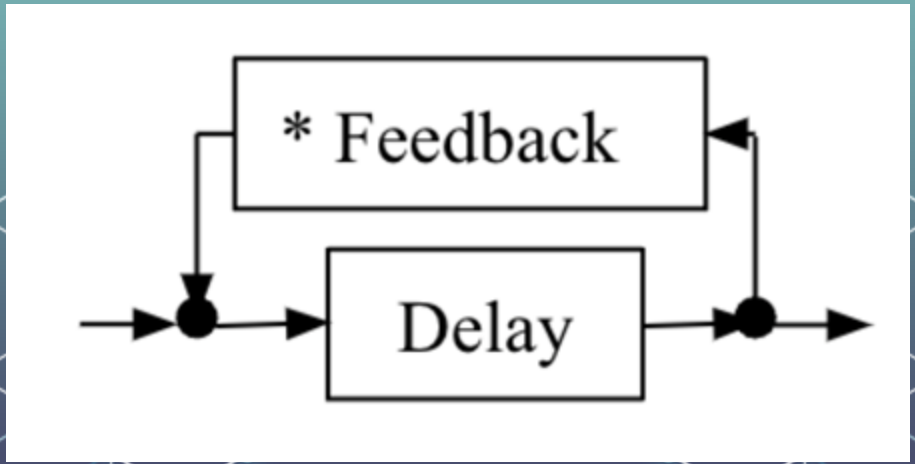
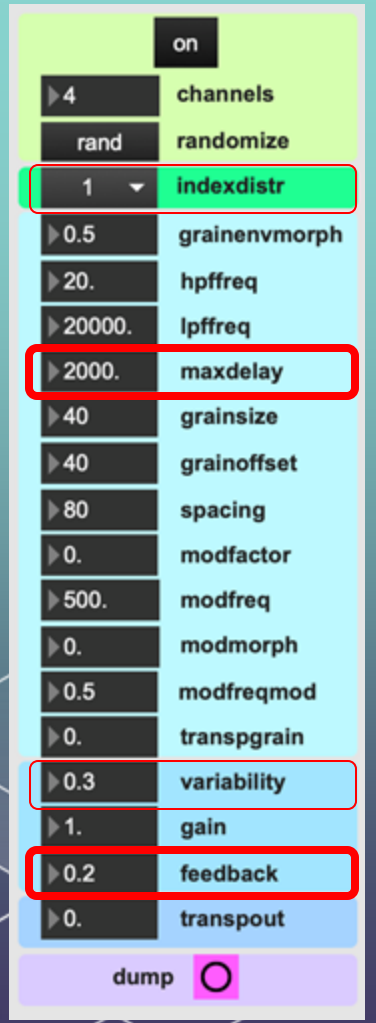
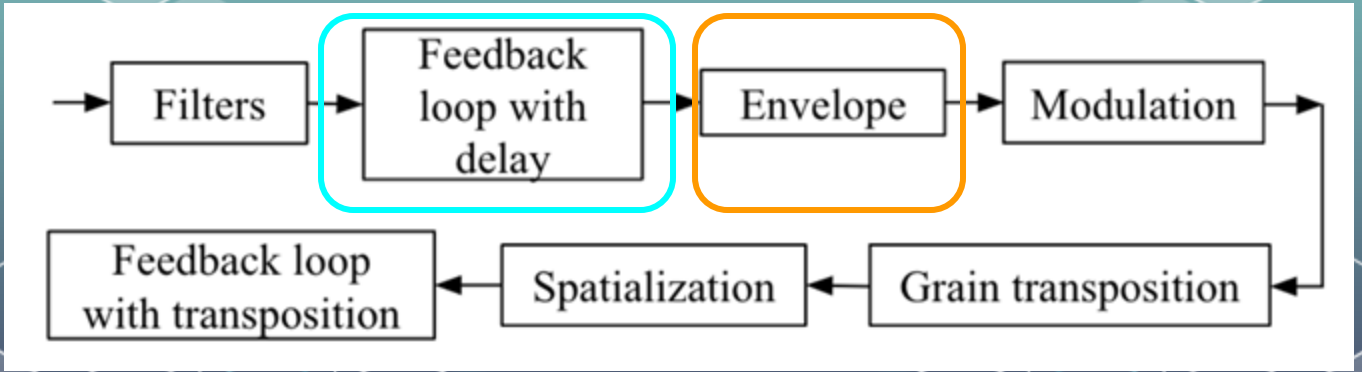
variability
1.
gain
0.2
feedback
0.
transpout
dump

Input delayed feedback loop

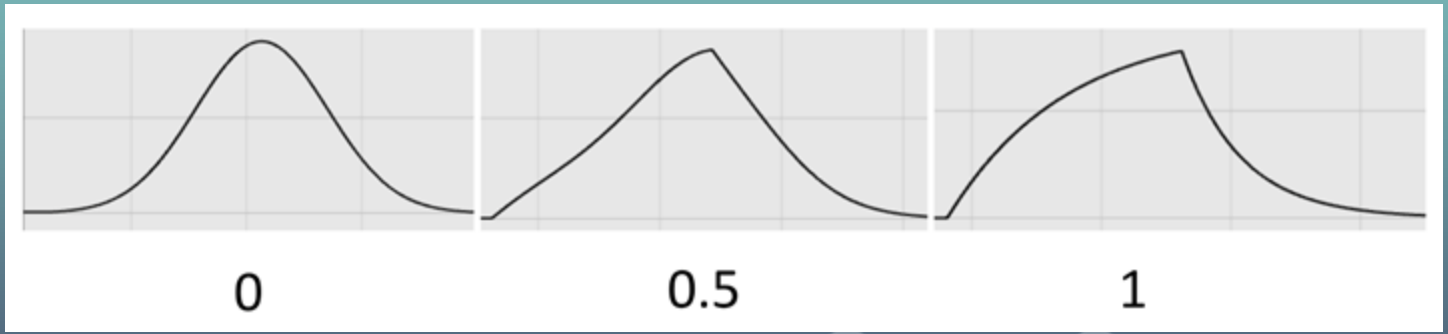




Simplified diagram



Envelope design



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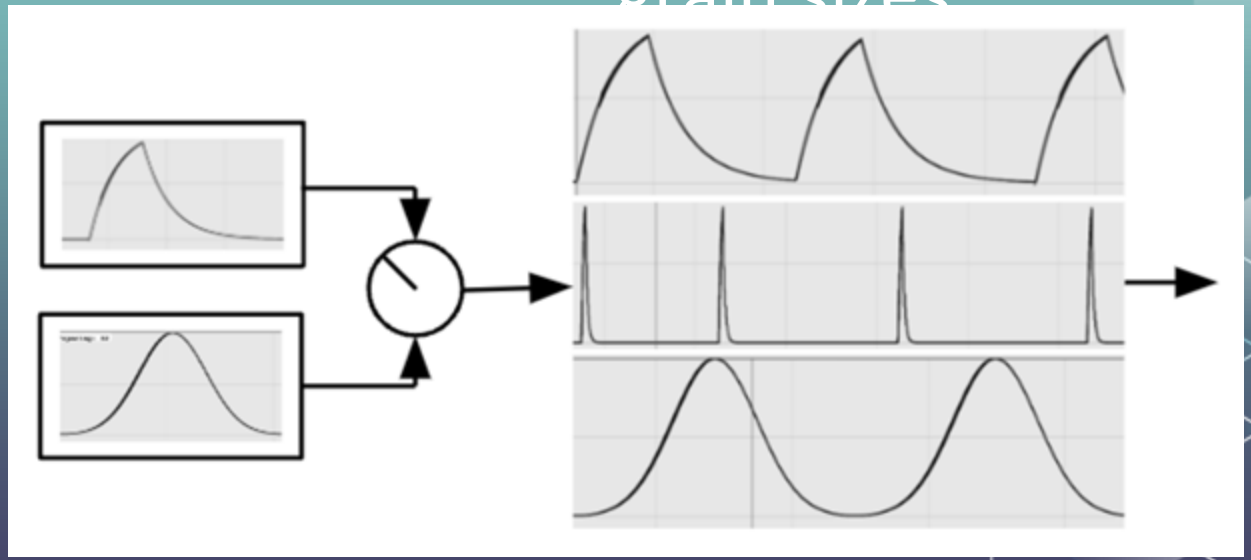
0.3	variability
1.	gain
0.2	feedback
0.	transpout
dump	

Morphing between envelopes and different grain sizes



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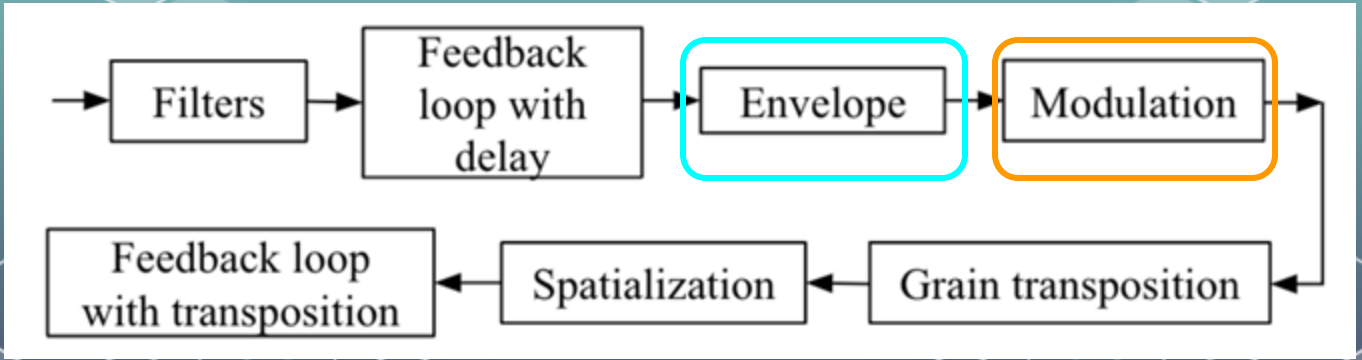
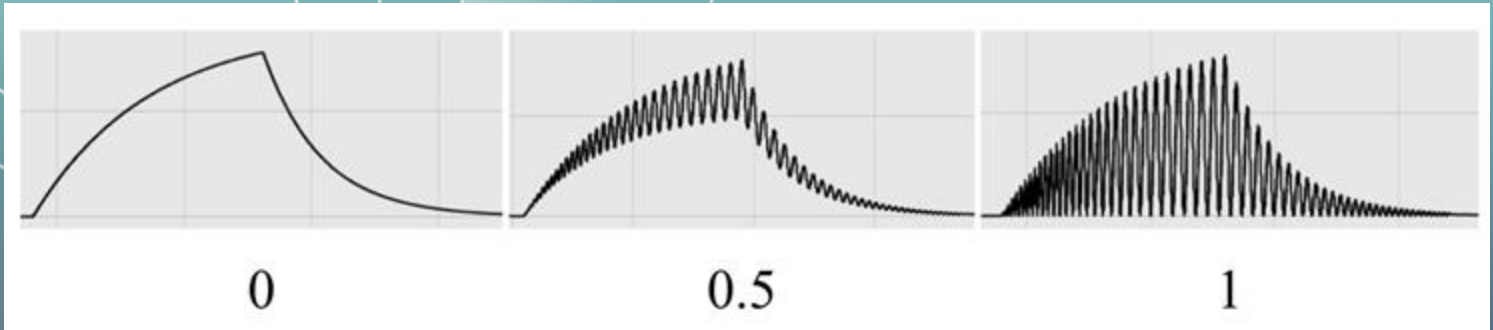
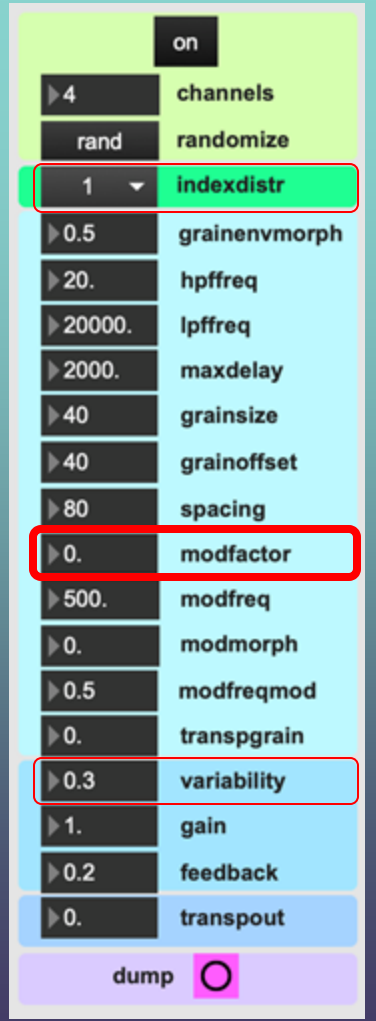
Simplified diagram

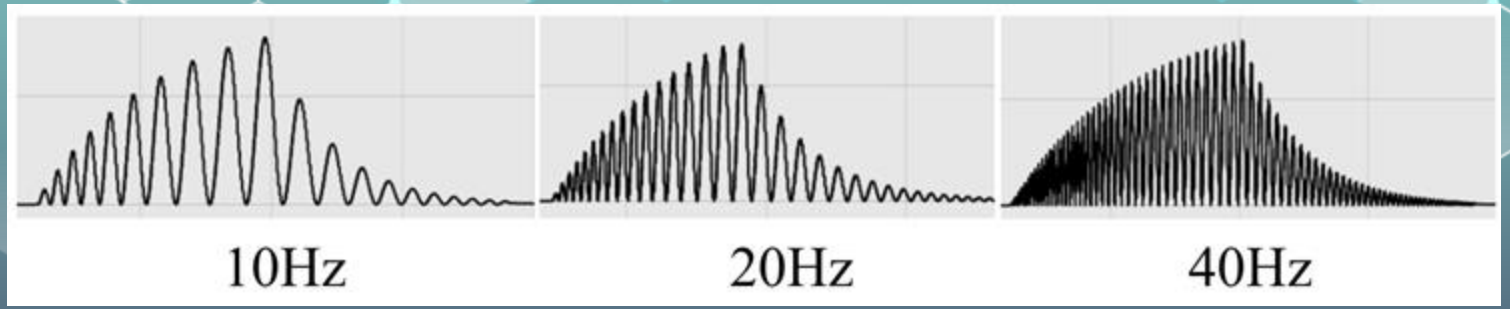


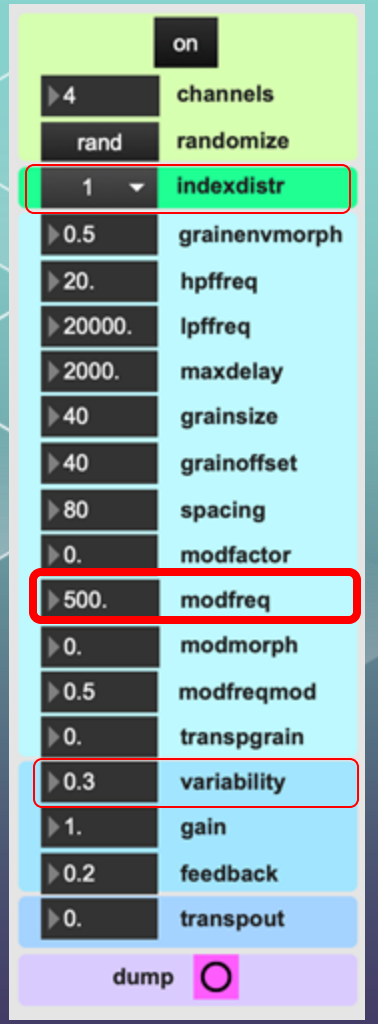
Envelope amplitude modulation



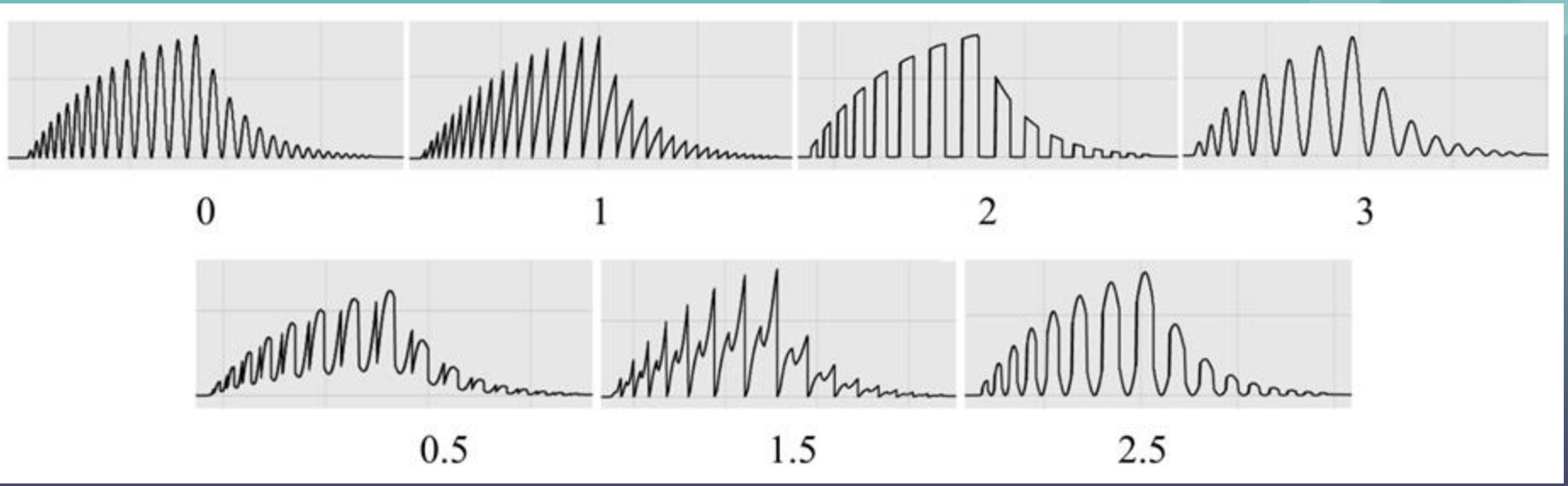


Variable “modfreq”

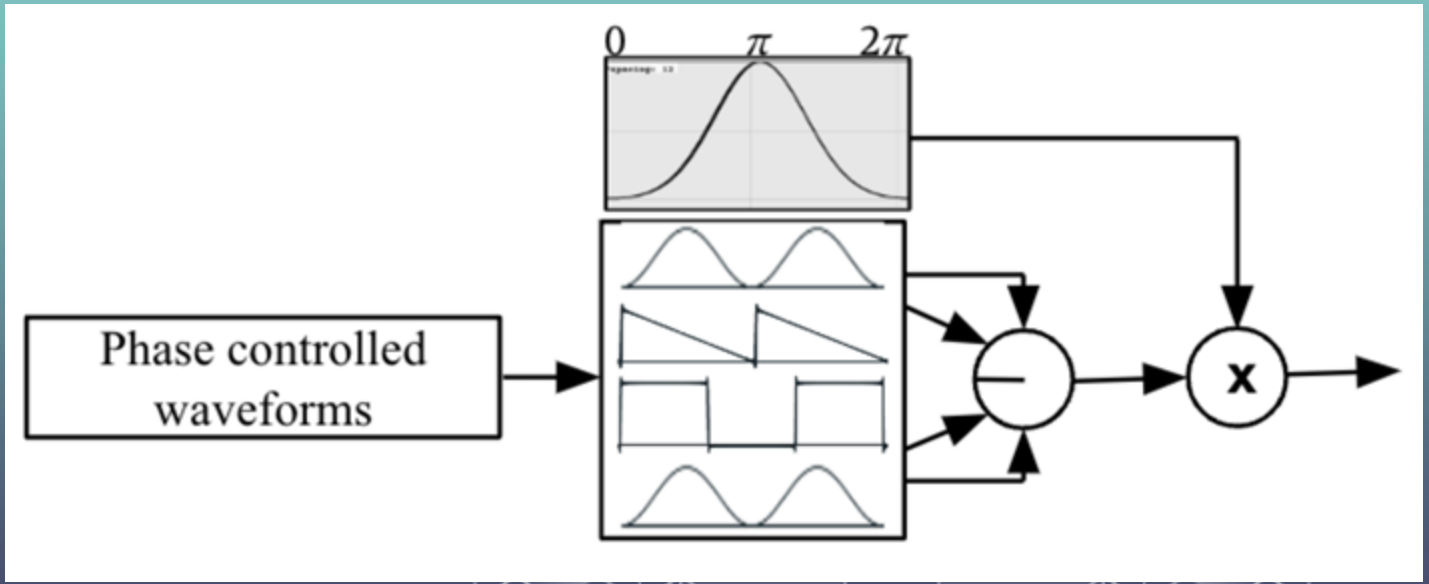


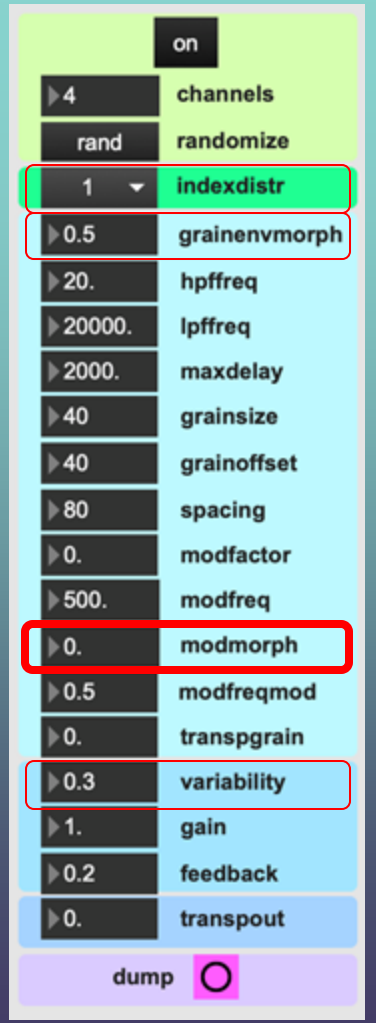


Modulating signal morphing from sine to square

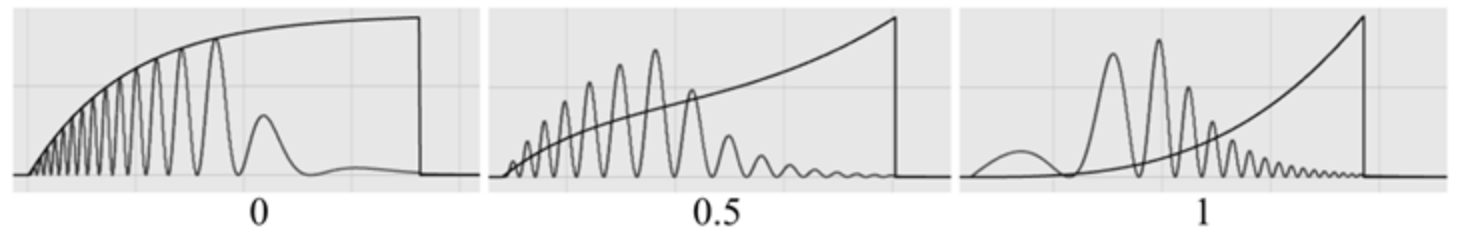


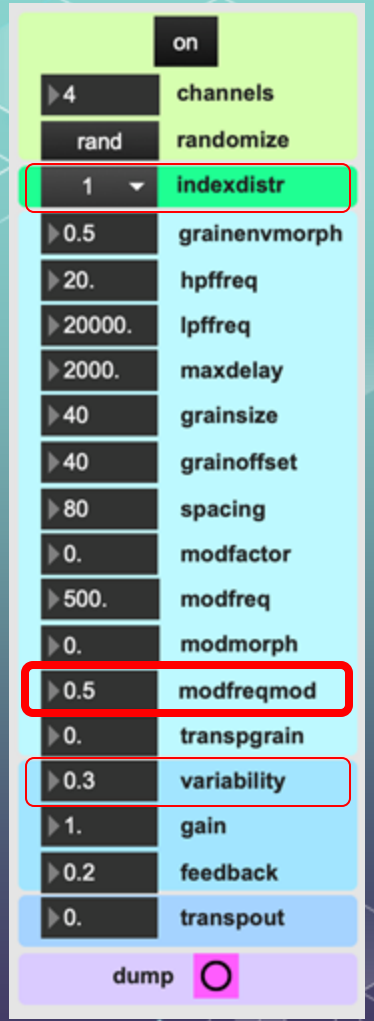
Mix of different modulating signals



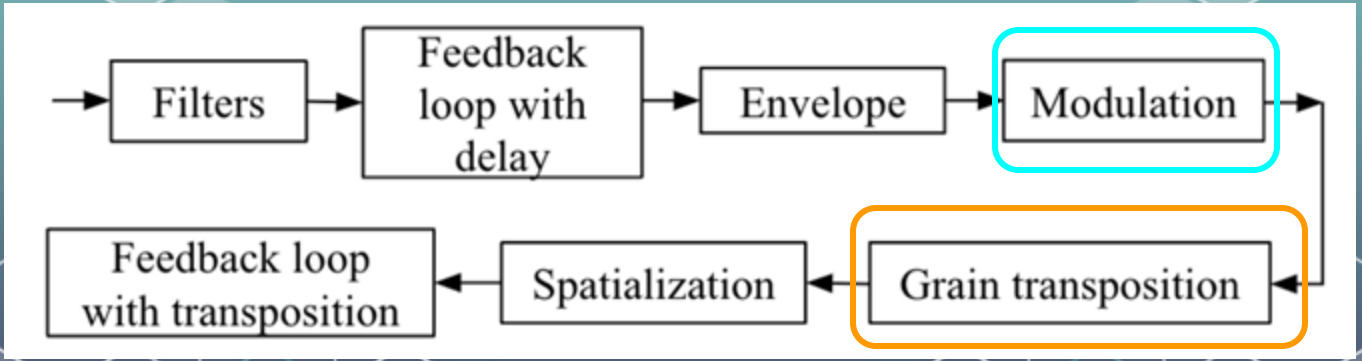


Frequency modulation of the amplitude modulating signal



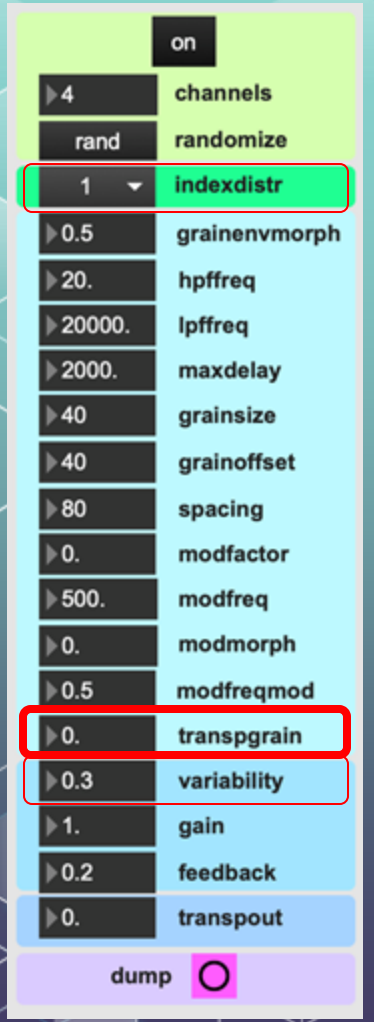


Simplified diagram

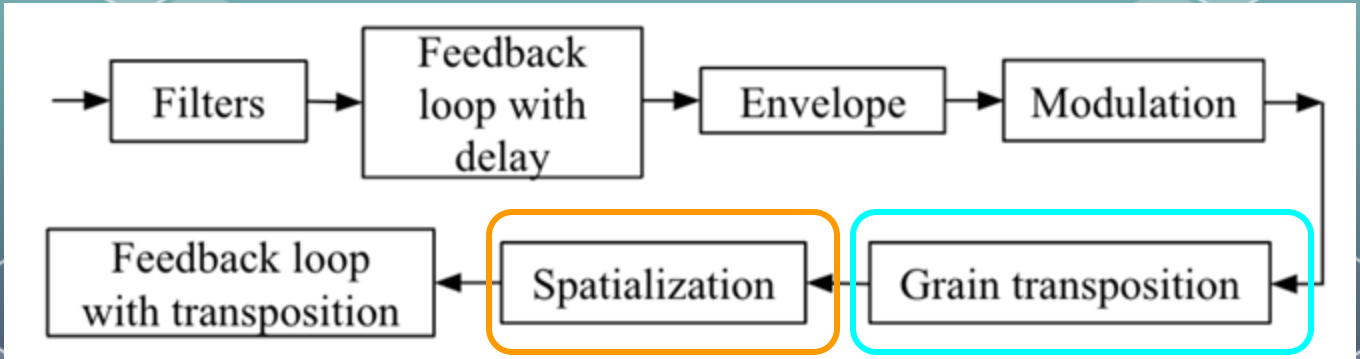


Grains Transposition

Grains are transposed within a range of -24 to +24 semitones



Simplified diagram



Spatialisation

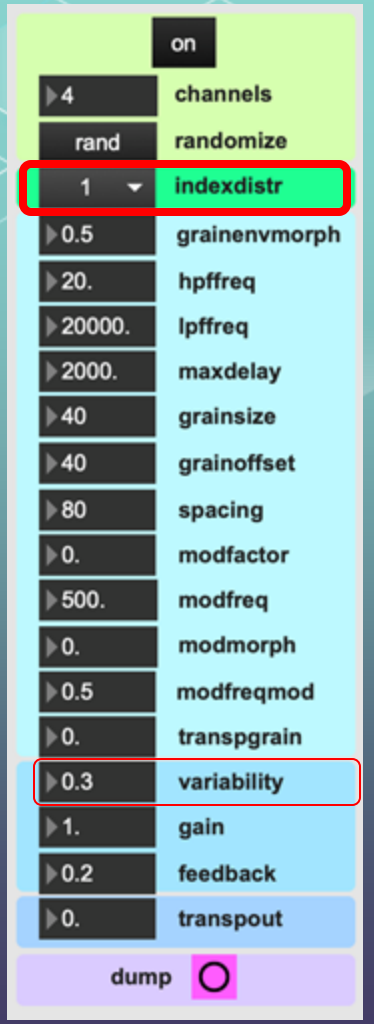
Spatial Sound Transformation

Between ambisonic encoding and decoding

Independent manipulation of ambisonic harmonic channels.

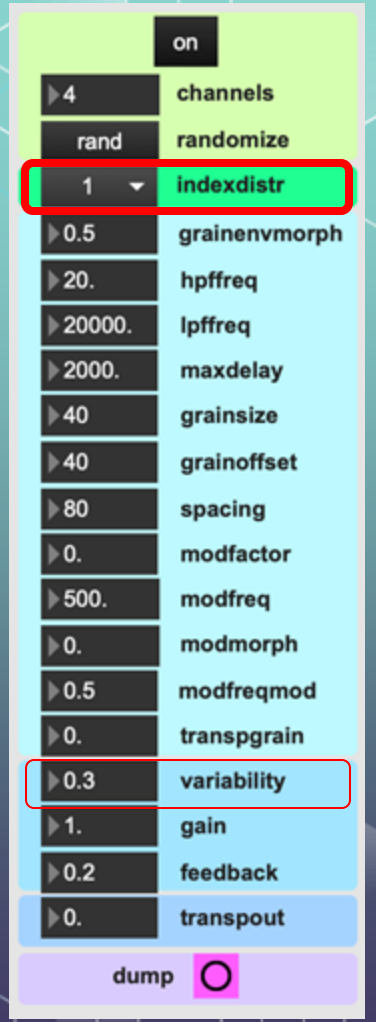
From Point Source to Diffuse Field

Ambisonic spatialization
Precisely localized initial sound to diffuse fields through feedback loops.



Ambisonic Distribution

x		
x^2	composite1	x^5
sin	x^3	1-(1-x)^5
log(1+x)	1-(1-x)^3	composite4
sqrt(x)	composite2	2^(10(x-1))
1-cos(Pi/2*x)	x^4	composite5
(1-cos(Pi*x))/2	1-(1-x)^4	1-sqrt(1-x^2)
1-(1-x)^2	composite3	sqrt(1-(x-1)^2)



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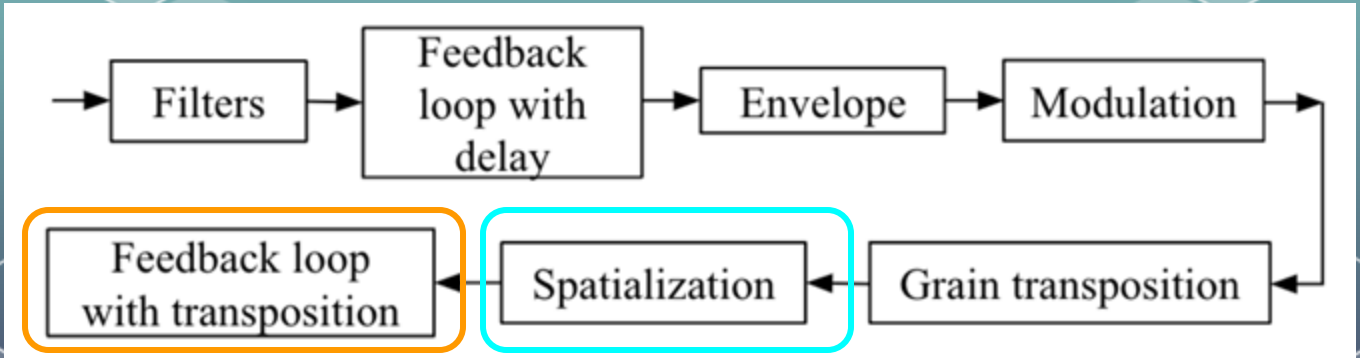
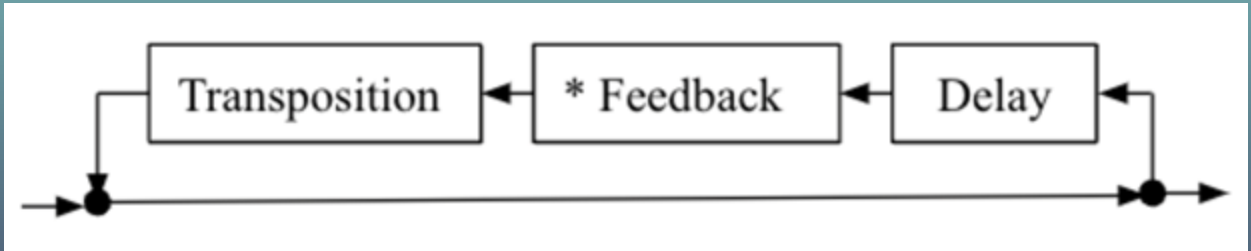
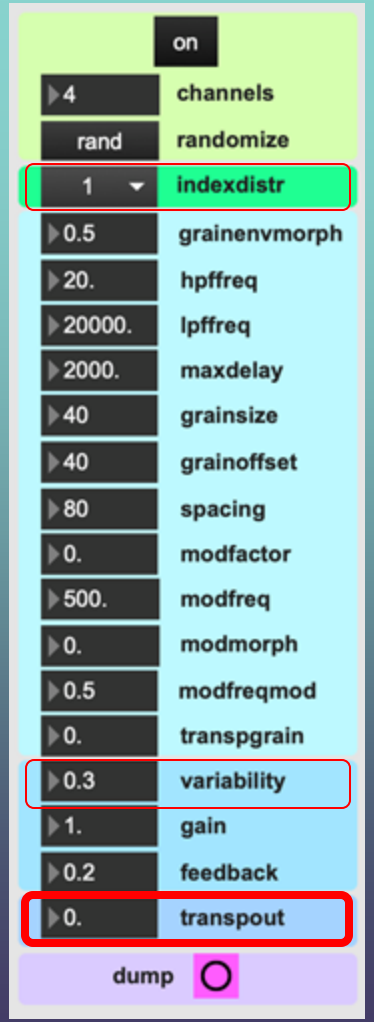


Grains Feedback Loop and Transposition





MACRO CONTROLS

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