

Composer:

Dimitri Voudouris

Composed:

2022 - 2023

Composition:

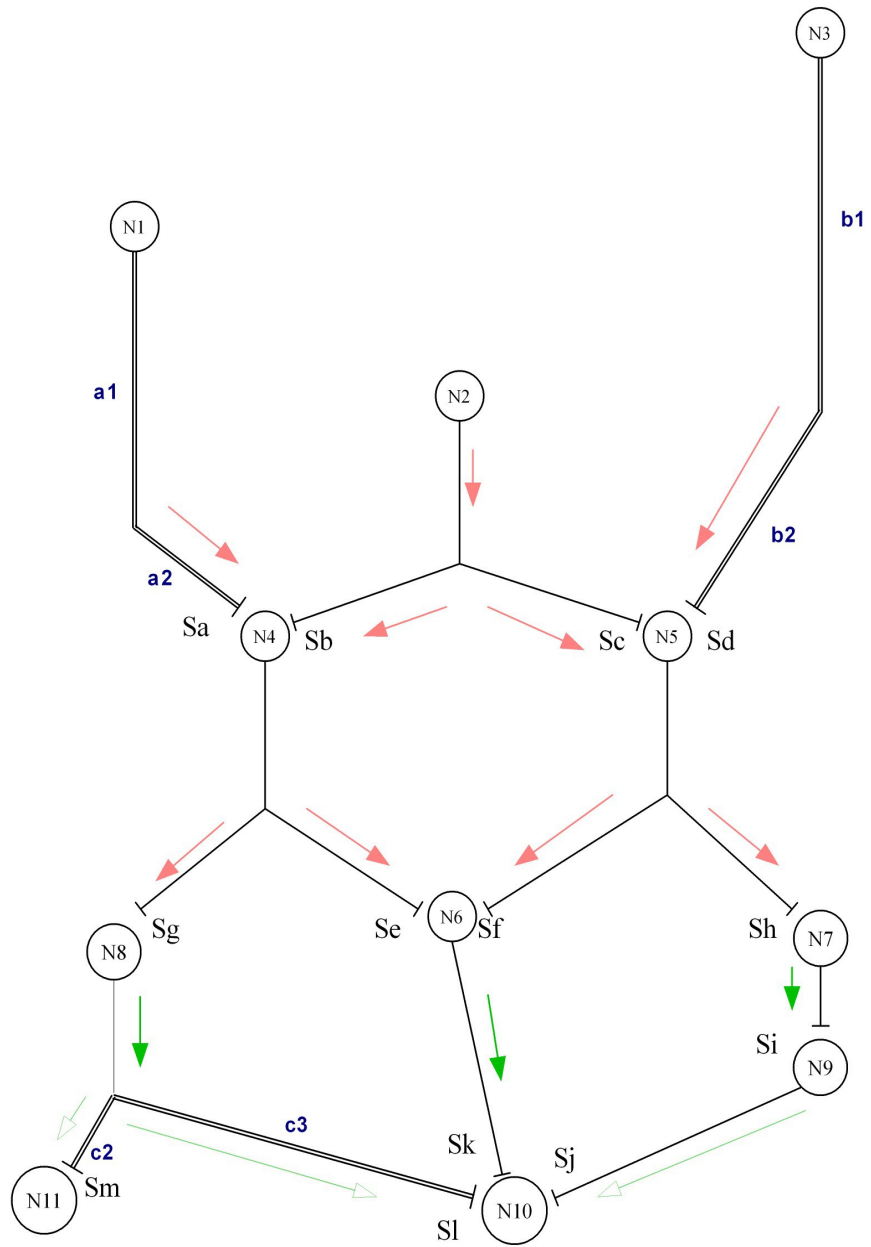
$\Sigma_{(n7)}$

Duration:

21 min 45 sec

Signal processing networks: 7

The Σ series - of compositions draw heavily from areas of biological science. In neural physiology, the axons of neurons are involved in resistance before synaptic transformation. Designing signal processes modular patches in sound synthesis according to the biological model will show the various challenges involved in producing sound. A myelination is a form of insulation that promotes the conduction of current over long axons. Audio generation algorithms, in modular synthesis, respond to higher-level control signals to create grained audio waveforms. accepting control signals such as `pitch', `velocity', and other parameters to shape the tone, timbre, and dynamics of a sound. The areas designed in network 3(of seven) in **fig1** positions a,b, and c indicate a weakness in the propagation of sound under these parameters. Applying a variety of 5 plugins randomly chosen function as sound enhancers **Table1**. Create a continuous flow N1-N4, N3-N5, N8-N10/11. Divergence and convergence network pathways could either directionally simplify or multiply signal processing in particular instances.



Signal processing network 3

fig1

In electrical current flow resistance, certain neurons are wrapped around with a myelin sheath reducing membrane capacitance, and current leakage and increasing its electrical resistance. This sheath allows a nerve impulse to travel further without amplification, reducing the metabolic energy required by the nerve cell. In short spaces between successive cells, called nodes of Ranvier amplification of nerve impulse occurs in a myelinated nerve axon with periodic amplifiers used to prevent the signal from becoming too weak. By contrast, signals in unmyelinated axons become weak over short distances and require continuous amplification of the equation. Resistance in an axon is measured by the following equation ($R=Pa^1/\pi r^2$). The cylindrical conducting axoplasm fluid of the neurons is the medium where current flows through the axon.

Neural network 3 in **fig1** is one of seven signal processing networks designed to (represent convergence N4,5,6,10 receiving input from many other signal processes, N1,2,3,7,8,9,11 represent divergence communicate with many other signal processes in the network). The diagram shows 3 reinforced resistant areas between N1 to N4, N3 to N5, signal process split between N8-(N10, N11) which can either simplify or multiply the sound in numerous ways.

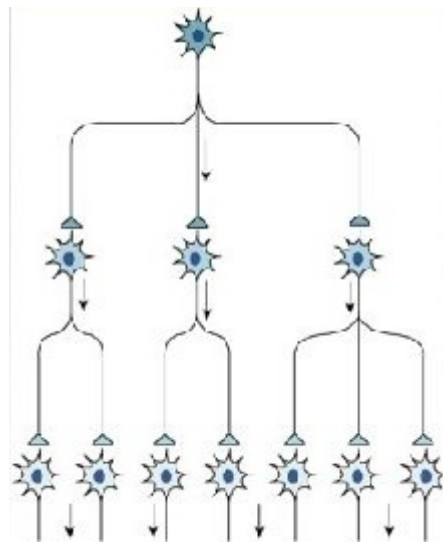


fig2: Divergence - one signal process affecting a larger number of processes

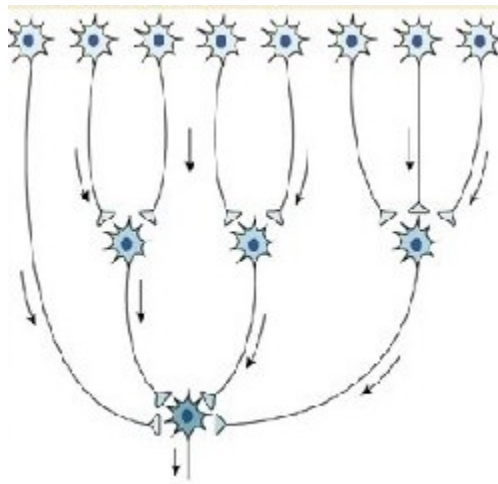
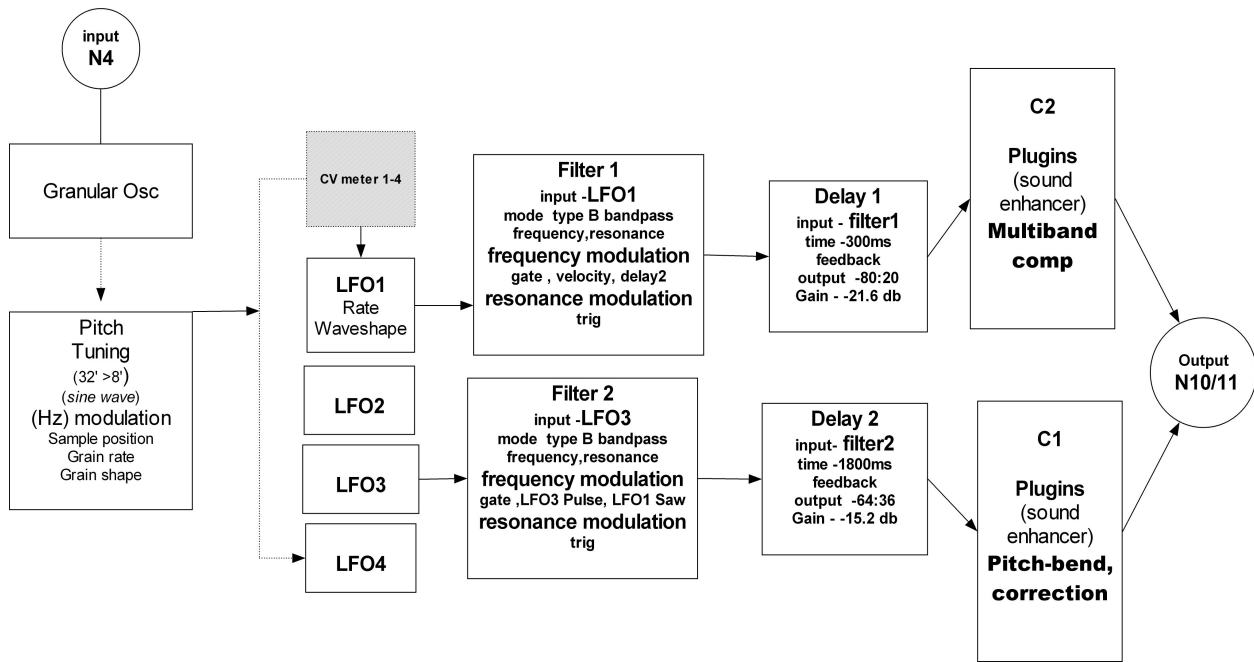
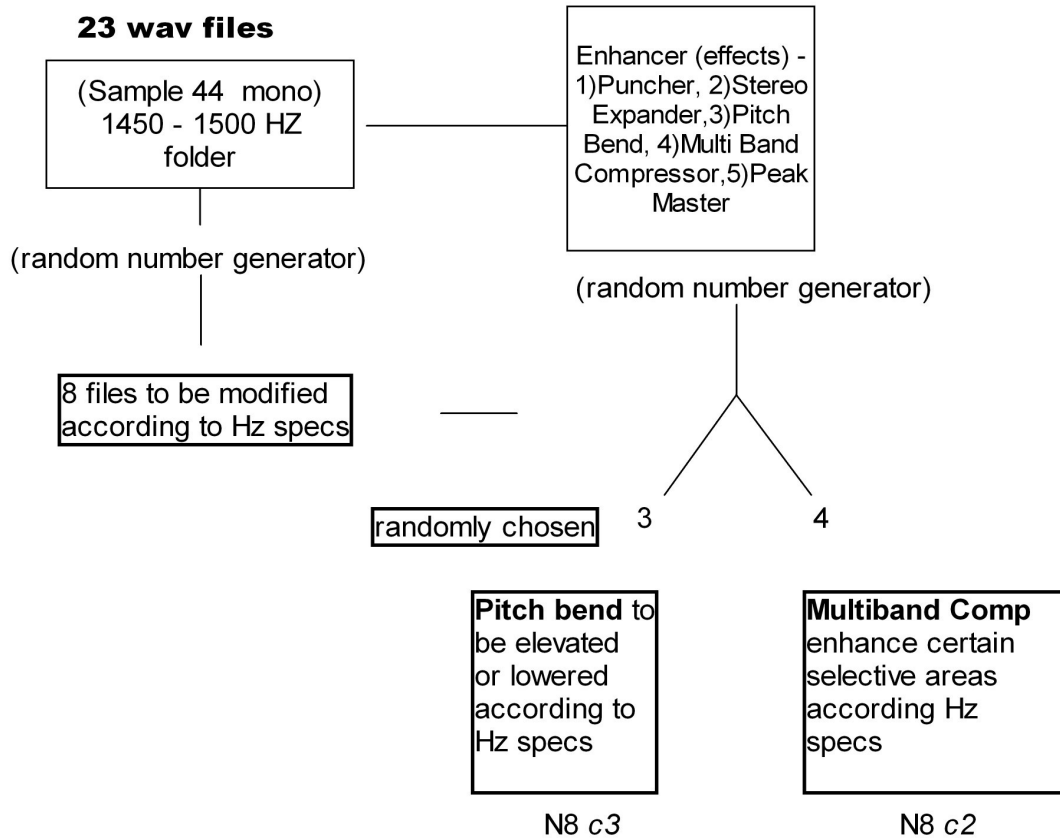


fig3: Convergence - multiple signal processes influence a smaller number of processes



Neural network 3: N8 (input N4 output N10/11)

fig4: The diagram above shows signal processing from N4 – N8 (showing a simple example of a single granular oscillator, 4 LFOs coupled with CV meters, 2 filters, 2 delays, and 2 plugins) allowing for split morphing to occur between the two signal processing inputs ----- **output** N10/11



Selection and application of sound enhancers

fig5

In the signal processing network, 3 points a,b, and c represent unidirectional sound frequency signals that undergo a reinforced sound enhancement changing the perspective outcomes of the final sound.

Random Sound Generator or pseudo-random number generator is an algorithm for generating a sequence of numbers whose properties approximate the properties of sequences of random numbers. a random number is a number chosen from a pool of limited or unlimited numbers that have no discernible pattern for prediction and are always independent of each other.

The nervous system plays an important role to conduct nerve impulses to different areas of the body through neural synapse interphase. An action potential is generated when the membrane potential exceeds a threshold. The threshold is lower at the axon reason is that the axon hillock has a high density of voltage-dependent Na⁺ channels, with each increment of membrane depolarization, more inward current flows at the axon hillock than elsewhere in the cell.

| | | |
|-----------------------------|----------------------|--|
| Puncher | Density | Soft, Medium, Hard |
| | Effect | 0 – 100% |
| | Input Gain | -12db - 24db |
| Multiband compressor | Selected compression | 25Hz - 22 Khz / -10 – 10db |
| Pitch Bend | Semitone range | 0 – 36 |
| | Smooth envelope | (ms/semitones) |
| | | whole sample in a uniform manner (ms/semitones) |
| Peak master | Input gain | -12db - 24db |
| | Out ceiling | -18db - 0.00 |
| | Softness | -5 - 5db |
| Stereo Expander | Width | 0 – 100% |

Table 1: Plugins that will act to re-enforce signal sound processing

Sound transformations free sound matter from its referent without stripping away its immanent nature its aura, the textural normality provides the initial impulse to open doors to the sound maze of creation and reception.

References

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