**The Stream Webpage**

A Sound Stream Generative System

“I dream of instruments obedient to my thought and which with their contribution of a whole new world of unsuspected sounds, will lend themselves to the exigencies of my inner rhythm.”

“There will no longer be the old conception of melody or interplay of melodies. The entire work will be a melodic totality. The entire work will flow as a river flows.”

- Edgar Varèse (The Liberation of Sound)

The Stream is a Max for Live Device (M4L) that transforms audio samples into streams of sonic possibilities. This device is designed to be an alternative to common techniques of composition and production, disabling interactivity between tools and artist in order to foster new composition methodologies through listening and chance. Through this cognitive change of sonic interaction, new ideas and solutions will emerge to overcome creative blockages and indecision. As of the precise nature and experimentation of the system, The Stream can produce a wide spectrum of sound types, ranging from percussion and short decay sounds, to drones and complex experimental manipulations. These sounds, while being captured, can be used for a wide variety of practices, such as compositional elements in a track, sound design for any visual media, and as sound objects for electroacoustic compositions and performance.

Essentially, the device operates as a granular synthesis engine, with its parameters dynamically modulated by a complex generative system and stochastic probability. The modulators responsible of triggering and manipulating the grains undergo constant modulations themselves, resulting in a diverse array of sound transformations over time. Apart from the user interaction of choosing which sounds are to be used, the device is autonomous in nature. The device allows the grains of the sample to flow like streams of sound, creating an ever-evolving sonic landscape.

The device metaphorically embodies the symbolism of a flowing stream of water. It operates autonomously, perpetually flowing with diverse currents and variations. Users are encouraged to perceive the device as akin to a natural stream, contemplating its inherent characteristics and sonic nuances. When a particular sonic aesthetic resonates with the user, they are invited to metaphorically “scoop it out” as if drawing water from a stream with a bucket. Because of the device’s generative nature, the sonic character will undergo endless transformation, even when employing the same sample or parameters. Much like a stream, it embodies Heraclitus wisdom: “No man steps in the same river twice, for it’s not the same river and he’s not the same man”.

The conceptualisation of this device derives from Pierre Schaeffer’s theory of the sound object. According to Schaeffer, when sound is fragmented and concretized in a recording, it becomes detached from its physical source and assumes an independent identity as an object. This object is perceived holistically, devoid of any reference to its original source. Sound Objects became Schaeffer’s primary tool for creating Musique Concrète compositions and served as a unit for identifying and classifying sounds. This device represents an attempt to further develop the idea of the sound object and suggest a new paradigm: the notion of the sound stream. Thanks to granular synthesis technology, a Sound Object can be frozen in tonal totality, destroying the chronological progression of sound and resonating its spectral content holistically.

Sound transcends its ephemeral nature through this process. Moreover, by employing generative algorithms to manipulate these grains, the device facilitates the autonomous evolution of the frozen sound, unlocking a myriad of possibilities exempt from human interaction. The sound stream emerges as a tangible unit of sound, shedding its ephemeral quality, and inviting perception that not only embraces its holistic nature but also acknowledges all its sonic metamorphoses.

The device is composed of three main building blocks: First a granular synthesis engine, were samples are loaded and transformed through this synthesis technique. Second, a generative multi-clock sequencer, that produces interesting rhythms and modulation. These rhythms are self-evolving and will change on its own through time. Third, a complex stochastic algorithm and decision tree, that change the parameters of both the sequencer and grain engine. As well, through this algorithm different modes of modulation might be selected or deselected in the synthesis process of the device.

For more information on the synthesis and DSP techniques used in the device, check the following sources. The granular synthesis in this device was mainly inspired by Curtis Roads and his book Microsound that can be found here. The sequencer was inspired in the practice of Mark Fell and his algorithmic composition, more information here. Finally the chance algorithm was inspired in Iannis Xenakis and stochastic composition, more information here.

For more conceptual information, check the following resources. Treatise on Musical Objects, by Pierre Schaeffer. Guide to Sound Objects, by Michel Chion.

<https://monoskop.org/images/d/d1/Roads_Curtis_Microsound.pdf>

<https://www.factmag.com/2018/10/06/mark-fell-signal-path/>

<http://sites.music.columbia.edu/cmc/courses/g6611/spring2012/week12/Gendy3.pdf>

<https://monoskop.org/images/0/01/Chion_Michel_Guide_To_Sound_Objects_Pierre_Schaeffer_and_Musical_Research.pdf>

**Interface:**

Using The Stream is very straight forward and easy to use. The sound generator in this device is a grain engine, which means that the device requires an input audio sample to function. Samples need to be dragged and dropped in the **Audio Buffer**. Please note that this device only works on WAV files. The device will manipulate and recontextualise the samples used, so the selection of the input sample will drastically impact the sonic character of the output.

Play the Ableton transport, as some of the algorithms need it to work.

Turn on the grain engine by enabling the **ON/OFF Toggle**.

Finally the **Gain Meter** at the end is used to adjust output volume.

**Getting Started:**

* Choose a wav audio file and drag and drop it in the Audio Buffer.
* Start Ableton’s transport. The sequencer and some modulation do not work without it.
* Create an audio track that has its input set to the track in which the The Stream is set. This track will be used to record the device.
* Turn on the grain engine.
* Listen carefully to the stream of sound that slowly evolves and changes.
* Be patient to the changes of the stream, as some can take a while depending on the generative process.
* When you like something quickly record it using the other audio track.
* If you don’t record something you like it will be lost for ever in the aether.

**Audio Examples:**

The following recordings are exploratory experiments carried away with The Stream device, in order to explore its sonic aesthetic and capabilities. As the device is generative, the only interaction with the device was choosing which audio files where fed into it and how many devices would run at the same time. The structuring and composition of sonic elements were set by the flow of The Stream.

Atabaque Stream:

This composition was created using four The Stream devices, each employing the same sample a recording of atabaque drums performance. Within it, very interesting rhythms and progression can be heard throughout the composition, flowing smoothly through each sonic element.

Five Streams:

The following composition consists of 5 The Stream devices running simultaneously, each with its unique sample. The samples were chosen randomly from a sound library. Even though the samples differ sonically from each other, The Stream manages to create interesting progressions from them. Introducing novel transformations of each sample throughout the composition.

I Am Sitting In A Stream:

This last experiment is an ode to Alvin Lucier iconic piece I Am Sitting In A Room. In the experiment, Lucier’s own recording serves as the initial input for The Stream device. Subsequently, the device transforms the recording and its output gets recorded and fed back into it. This process continues until the output bears little resemblance to its original form. Much like Lucier’s piece, this experimented uncovered the inherent resonances of The Stream, extracting only abstract grains and revealing the algorithms at play. The experiment was conducted twice, creating the two parts of the composition. Despite following identical processes, each part is completely unique, showcasing the device capability of endless variation.