Fluid Flows, Transit, and Symbols

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1. PROGRAMME NOTES

Fluid Flows, Transit, and Symbols is a composed interpretation of fluid flow within a pipe; actualized through live vocalizations, granular synthesis, FM-synthesis, and sampling.

The synthesizers, sound design, and sequences are all built completely through code.

The composition is accompanied by a granular synthesized poem (Fig 1); The poem's subject and form is inspired by fluid mechanics, transit, symbols, and the composer's grandmother.

During the performance, the performer reads the poem while simultaneously structuring the organization and timing of the coded composition.

((, {
Symbolic
(is an empty word)

Until this water is running.

Flow is varied and plastic is uniform
The proteins you composed
are beautiful
}) ;
My memory hasn't
loaded
I can't wait

Compressible
Perforated
Pressure boils
And

Kelvin is absolute;

/ /\ \
Static
Excited
Anything but laminar;

Transition into turbulent
Even Transition
odd even
There are no cracks in flow
when fluid fills the body it encompasses;
\ \/ /

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and knowledge won't let you,
feel better
and I won't wait,
for you

"deep rivers
run quiet"
)

Fig. 1. FFTS poem pre-granular synthesis

2. PROJECT DESCRIPTION

The foundation and inspiration of this piece originated from the visual waveforms of water travelling through a pipe, transitioning from laminar (smooth) to turbulent flow (Fig 2). In these waveforms, the behavior of the lines is steady and predictable, then erratic and random[1]. The piece evolves through a similar movement, as if the listener is standing amidst the pipe flow.

There are 3 main FM synth tones: laminar, friction, and turbulence. Each of the FM-synthesizer engines generating these tones are built from one another. The sonic fabric and texture of the coded synthesizers within the sequences are determined through noise generators that output random interpolated values around a chosen frequency.

In addition to the synth sequences, a reading of the composer's poem accompanies the synthesizers and is processed through a granular synth. The granular synth throws random fragments of the poem into the soundscape unpredictably, panned to either ear. This unconventional splicing and interspersing of the poem was inspired by Stéphen Mallarmé's use of space in visual poetry [2,3].

The score is divided into three movements. The listener is invited to experience the different sonic textures as they weave into each other and place oneself along the walls of a pipe as fluid transitions from turbulent to laminar, back to turbulent.

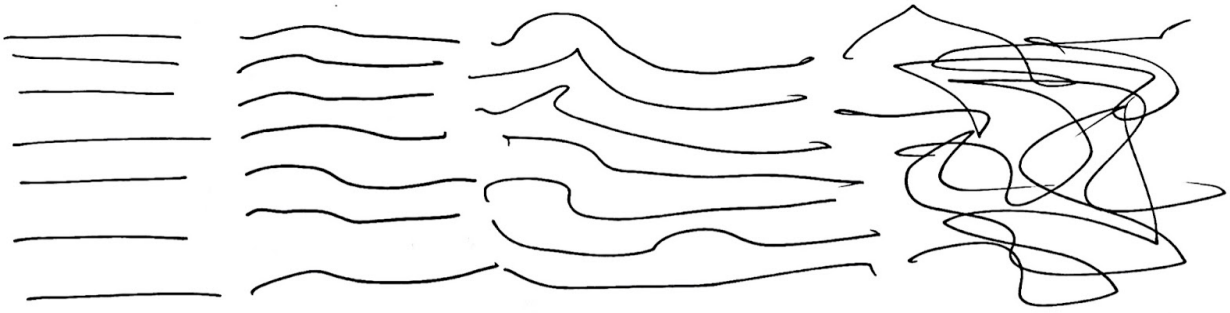

Fig. 2. Visual representation of laminar to turbulent flow.

3. PERFORMANCE NOTES

The performer will read the poem, and operate the coded composition live. All gear required for the performance (microphone, laptop, and audio interface) will be on stage, controlled by the performer. The piece is entirely designed/composed/recorded/processed/produced in SuperCollider.

4. MEDIA LINK(S)

- Video: https://youtu.be/pqXVQGBpPWE

REFERENCES

[1] Hattori, H., Wada, A., Yamamoto, M., Yokoo H., Yasunaga,K., Kanda, T. and Hattori, K.,"Experimental study of laminar-to-turbulent transition in pipe flow," *Physics of Fluid*

[2] N Rashwan, (2006) "Towards the Visualin Poetic Experimentation: Stephen Mallarmé & Guillaume Apollinaire," *Journal Management Association;*

[3] Ross, A. (2016) *The terrifying beauty of mallarmé*, *The New Yorker*. The New York Times. Available at: https://www.newyorker.com/magazine/2016/04/11/stephane-mallarme-prophet-of-modernism (Accessed: June 12, 2022).