

Algorithmic Pattern Salon Submission

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Contributor data

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Short biography

Maia Francisco is a performer and sound artist based in Barcelona. Her interest is focused on the use of pure sound. She develops her work through the vehicle of improvisation in conjunction with specific usage of electronics.

Maia studied art and design at Barcelona's Escola Massana Centre d'Art i Disseny and studied piano at the city's Conservatory of Music. She holds a Master in Sonology by the Institute of Sonology at the Koninklijk Conservatorium in Den Haag, Nederland. She is currently part of *TopLap-Bcn* collective.

Topic

Patterns in nature: ***Patterns of water ripples***

Title

Development of an algorithm with *SuperCollider* as a translation of patterns of water ripples into sine waves

Abstract

Sine waves propagate in space causing beating patterns and phase interferences. Water ripples are a very good visual representation of the propagation of sound in space. Water ripples are in constant movement and collide one to each other creating a complex **pattern**, very clearly appreciable on the surface of the water.

This research project focuses on the development of an algorithm using *SuperCollider* with the aim to translate **patterns** of water waves – ripples - into sine waves – constant sound.

This research work is going to be based on previous research carried out.

The previous research work explored the transition between one medium and another – i.e., from visual to sound. The basis for this work was the analysis of my visual experience of water ripples rather than a scientific analysis of water waves behaviour. It was about to find a relationship between visual vibrations– **patterns of water ripples** – and sound – sine waves.

The previous research work was taking into account several natural behaviours of the sine waves that are described below.

Beating patterns are so mathematically exact – the beat frequency is always the same amount of cycles per second – then the sine wave is not flexible and the harmony between water ripples and sine waves does not take place.

In order to look for the synaesthetic effect between the **patterns of water ripples** and the sine waves is convenient to use random amplitude modulation for the sine waves. In order to have a more organic sound that will be more in harmony/concordance with the apparently random movement of the patterns of water ripples.

Instead of including a single sine wave, is convenient to add more sine waves with different frequencies and amplitude modulation to generate a more organic effect because the ripples are multiple and simultaneous so the sine waves should behave the same.

The audiovisual developed during the previous research helps to understand the starting point of the following research.

The chose of the frequency for this piece was influenced by the pleasant influence in our ear. It has been tested that the 220Hz is a pleasant frequency for the human hearing. I wanted it to be pleasant because the sinewave was going to last for at least 20minutes, which corresponds to the length of the original video. Sine waves in a certain frequency and amplitude and extended duration, can be very unpleasant and even harmful for our ears.

- *Water Ripples and Sine Waves* (2017), audiovisual (05'48"excerpt)
<https://vimeo.com/865643732>