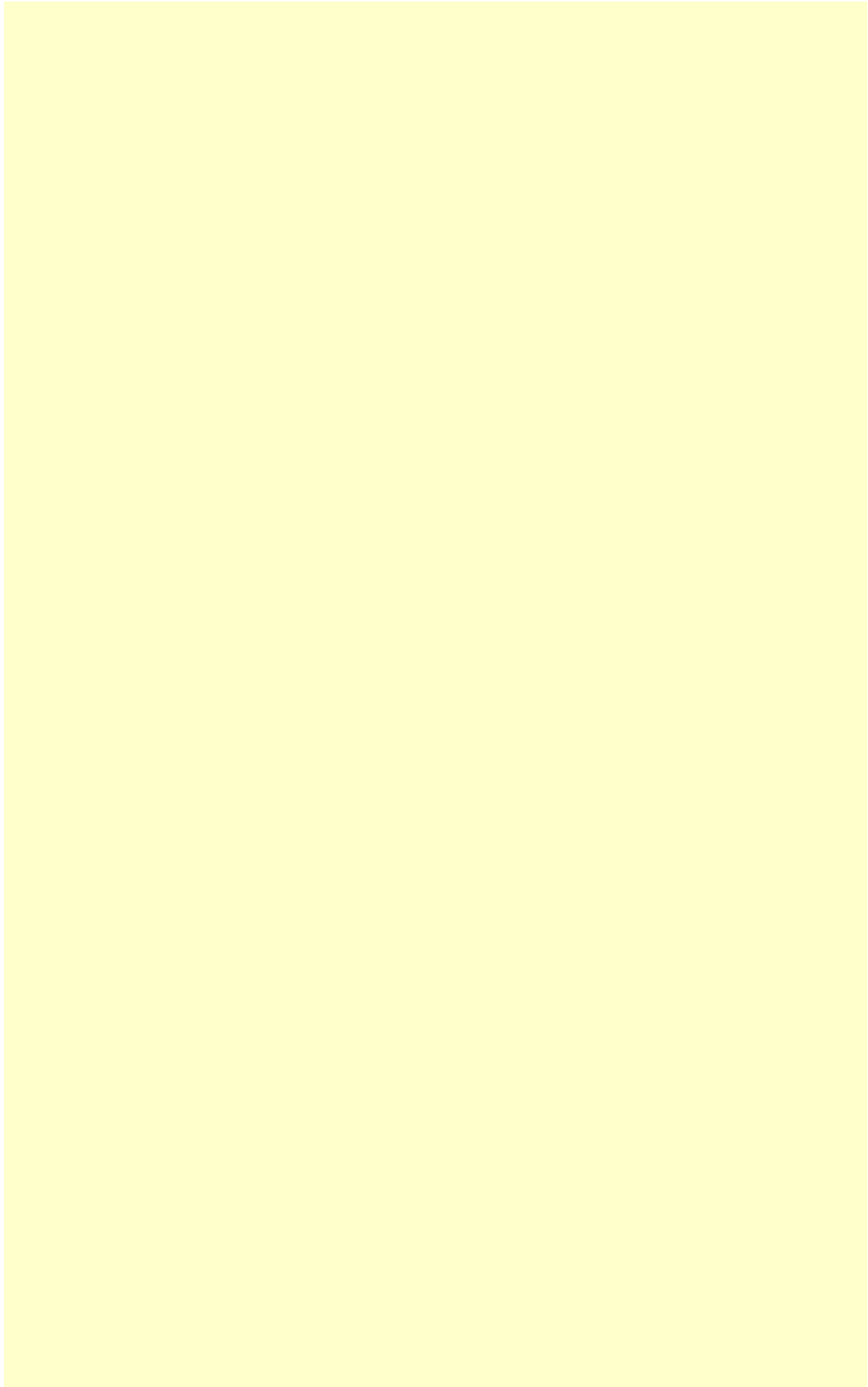


Artificial evolution 29 (hin7459)
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Composer / Researcher

Dimitri Voudouris

Composition

A [EV]: 3070/7f

Composed

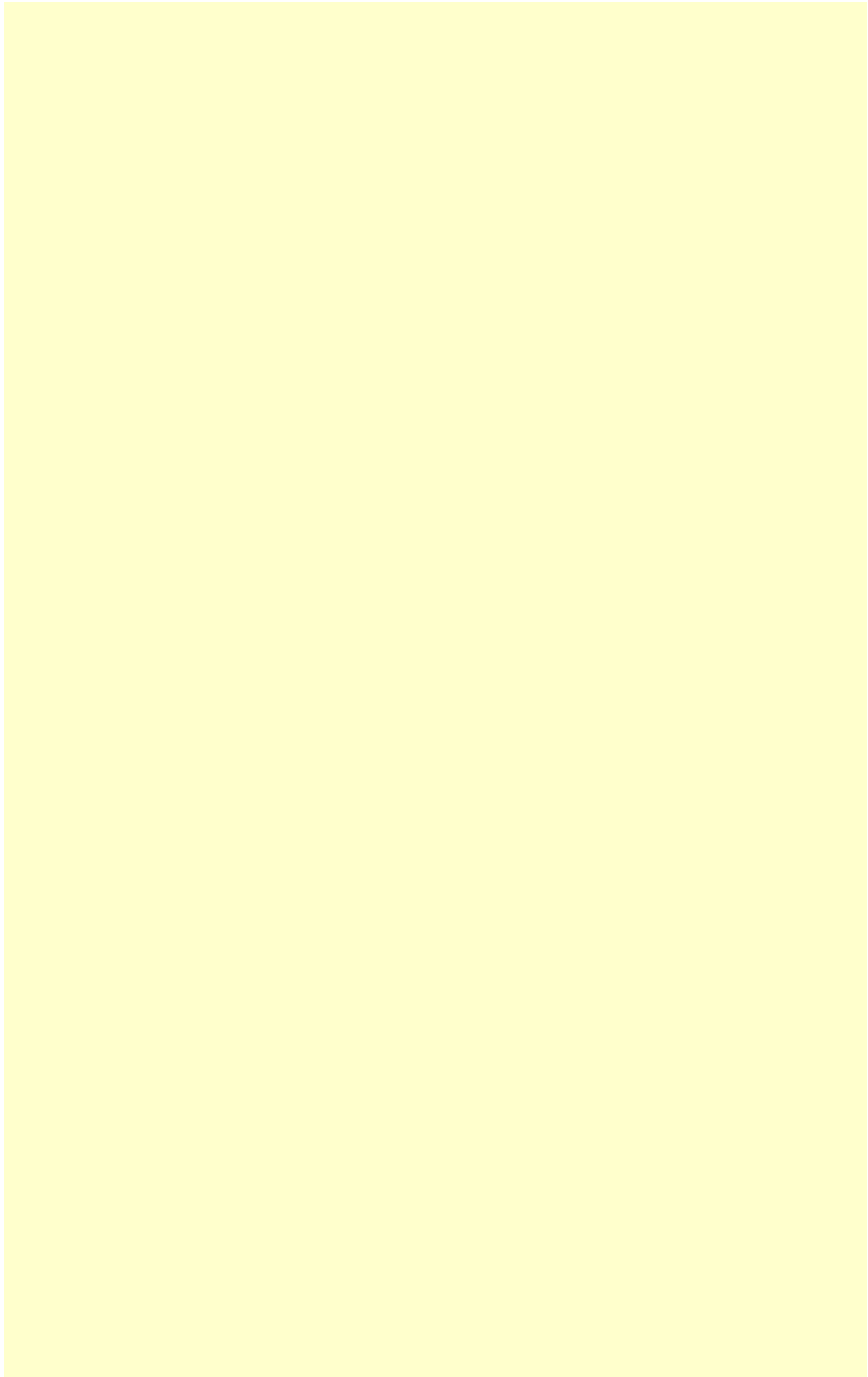
[2013 - 2014]

Duration

10 min 50 sec

*Artificial speech and singing synthesis,
computer assisted electronics,
[composition assisted by Matlab's
computational autonomy]*

Diffusion - 6.1 active audio speaker monitors.



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Matlab in artificial symbiosis:

Matlab is used as an assistant composer in A [EV]: 3070/7f computer music composition to solve mathematical problems. Partially developed sound fragments are presented to *Matlab* in bundles with a linear time restriction of 60 seconds. Emphasis, however, has been given to the ability of *Matlab* to perform computational tasks with minimum human intervention (computational autonomy) resulting in processing, positioning, adjusting, rearranging, selecting and precise splitting of sound fragment/s in a variety of ways. Constructing "colonial" sound "fragments" in which each fragment and its subordinate sound fragments form units similar to "clade/s". The process of fragmentation and the possible structuring into group formations plays an important role in the mechanism of selection and strategic structuring of the environments.

Selection a process of symbiotic mimicking by Matlab:

- [a] If sound fragment/s benefit or obligate from the coexistence [benefits in density, duration, pitch, intensity and velocity from the surrounding environment] while the other sound fragment/s coexist. They would primarily be selected in *Matlab* and processed and grouped, in group **one** of selections.
- b] If coexistence is beneficial for more than two symbionts. They would primarily be selected in *Matlab* and processed and grouped in group **two** of selections.
- c] If the original sound source (host) suffers from the coexistence but the other sound fragment/s neither benefits nor coexist. They would be rejected.

Matlab three steps in computation process:

- 1] Processing is done in areas of density, duration, pitch, intensity and velocity.
- 2] Splitting of sound fragments.
- 3] Selecting , assembling, placing and positioning the sound fragments into the final composition module.

Composition:

Artificial audio symbiosis: Is a configurative construction, an interaction between different sound fragments existing in close physical association, typically to their advantage. In the construction of **A [EV]: 3070/7f – Artificial evolution consisting of 3070 sound compartments**. The environments constructed were placed together in the form of a puzzle. Positioning of the cell like compartments had to follow an organic pattern. Each biotic compartment had morphological differences in various orders of positioning, density, duration, pitch, intensity and velocity. The computer was programmed [through Matlab] to statistically work out these variations with possible suggestions. Most sound compartments have environments within environments suggesting that within a complex system there are various possibilities that can change the outcome of the composition in a multiple ways. This process of adaptive artificial intelligence which leads us to an evolutionary splitting event in the construction of a sound “fragments” and the development of a greater variety of subordinates. This procedure resulted in 29 compositional modules or sound evolutions. A[EV]: 3070/7f is the evolution selected for this project.

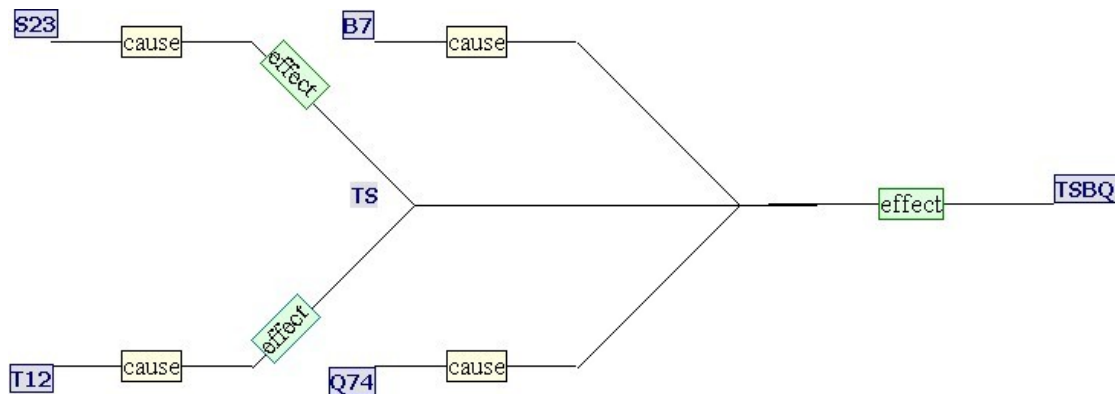


fig 1

[Artificial sound] evolution – Formation of clades TS and TSBQ, with S23 [sound fragment/s] combined with T12 [sound fragment/s] having particular velocity, pitch, density, duration, intensity form a new audio segment TS [clade]. Further combining TS with B7 and Q74 results in an evolution of artificial new outcome of sound [clade] TSBQ.

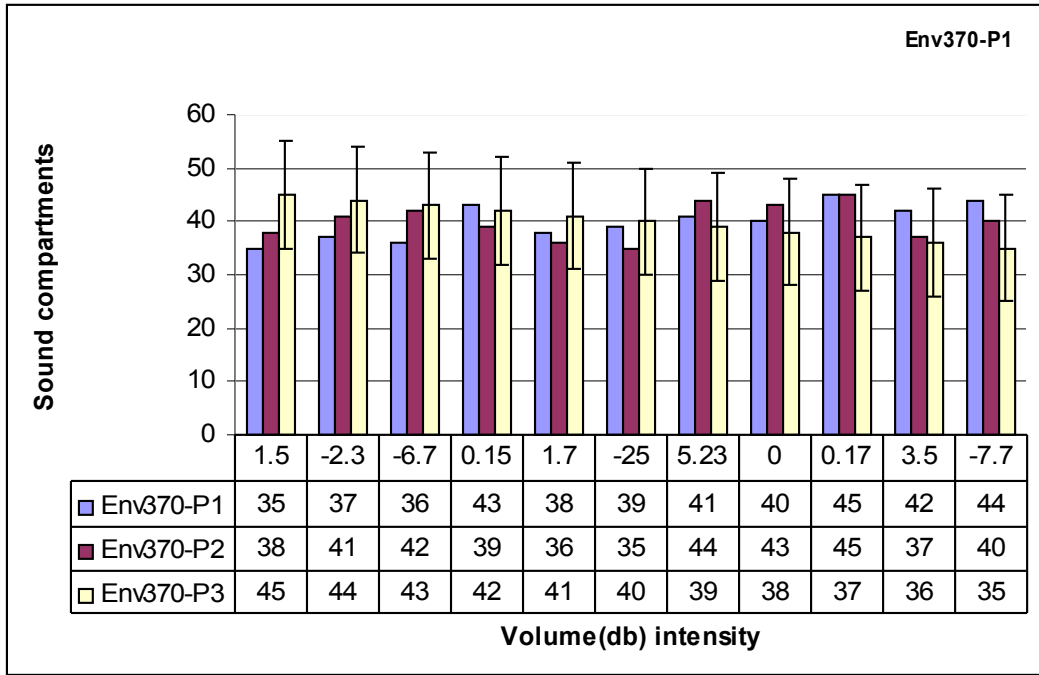


fig 2

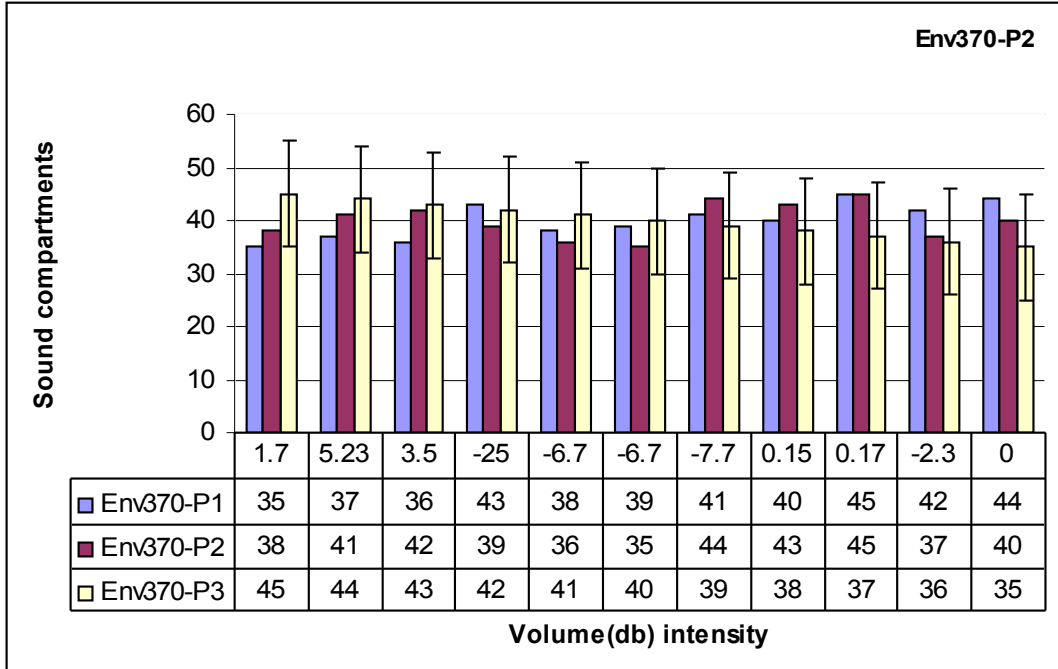


fig 3

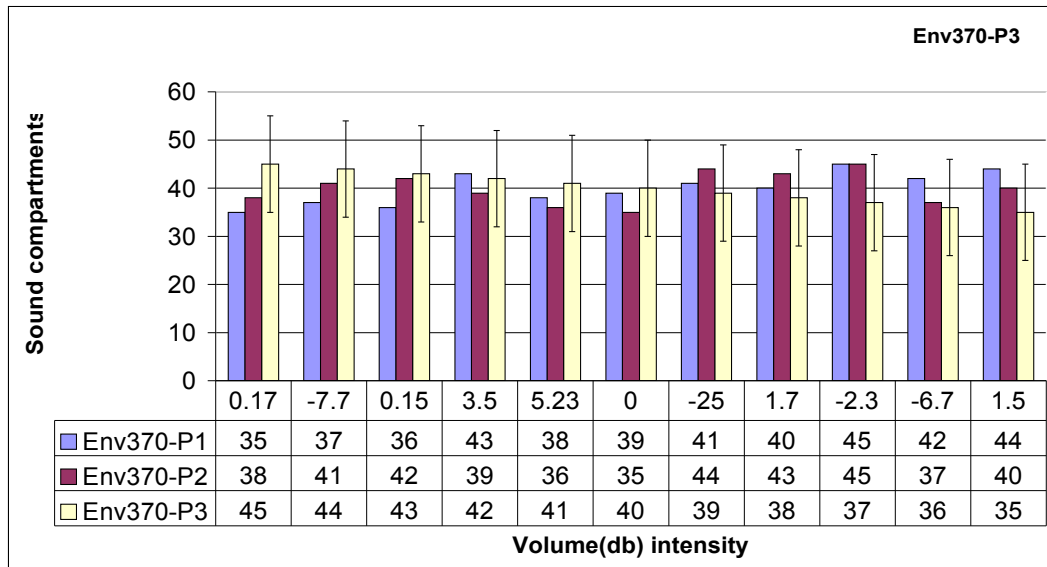


fig 4

fig 2, fig 3, fig 4 above showing different intensities created [Env370-P1,P2,P3] resulting in audio variation changes creating environments within one another producing different sound evolutions.

Matlab methodology :

minutes	Introduction of bundled sound fragments [to Matlab]	Developed sound fragments
1	23	95
2	49	140
3	117	223
4	232	459
5	211	474
6	93	177
7	346	643
8	298	337
9	234	350
10	70	85
10.4	44	87

fig 5

3070 matlab developed sound fragments made per 60 second time intervals used in A[EV]3070/7f.

Complex Systems :

“Colonial” sound fragment **73** constructed from **4** subordinate sound fragments namely:

“colonial “sound fragment 73

subordinate sound fragments - 1] a/73, 2] g/73, 3] c/73, 4] l/73

Time

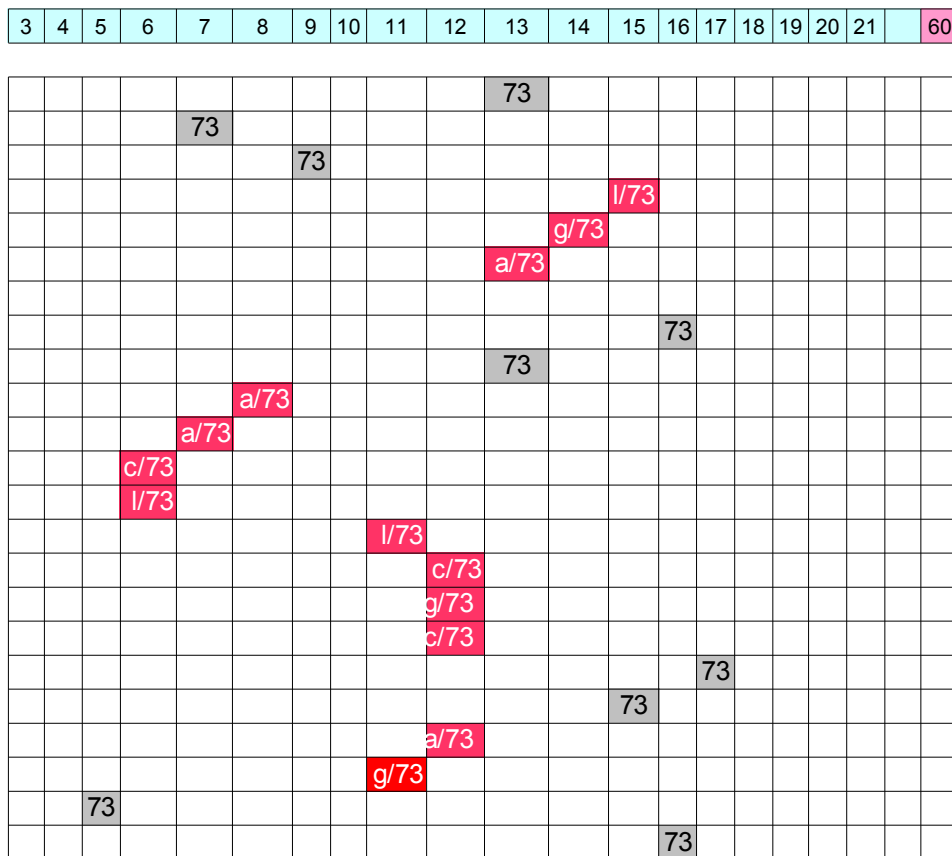


fig 6

*23 assembling fragment selection processes within 180 second time interval.
 The biological selection resulted in 4 sound placements. The highlighted data similar to clade formations [each with different density, velocity, pitch and intensity but similar duration]
 - sound fragment 73 .*

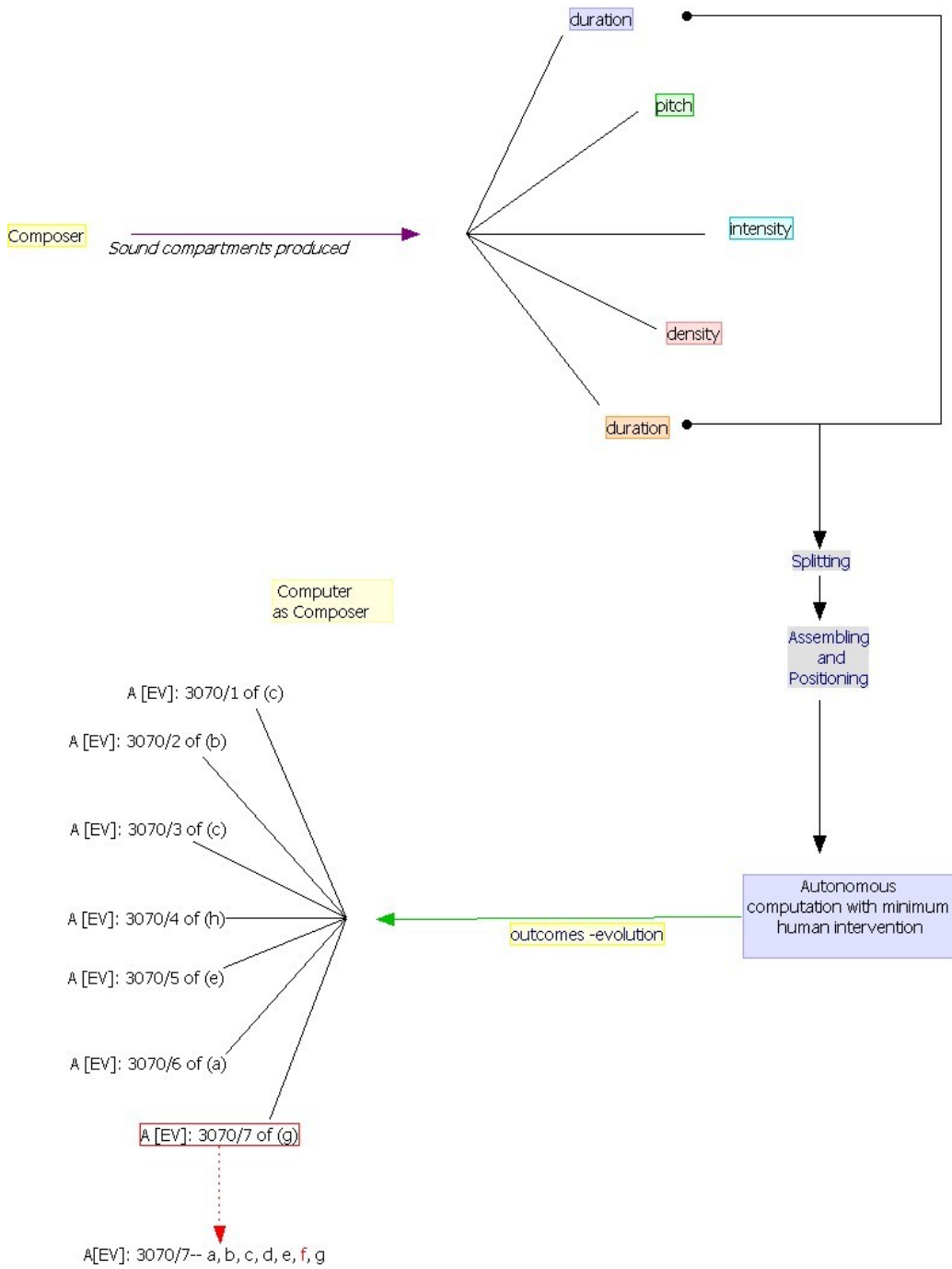


fig 7

Composer / Computer process of decision making in outcomes artificial evolution

Performance:

Diagram for the performance of A[EV]3070/7f

- 1] If audience is standing the height of speakers 1.8 meters
If audience is sitting the height of speakers 1.2 meters
Tilted 20° down
- 2] Speakers to be positioned 50cm from the wall
- 3] If as in the diagram the diameter of the audience space is 6 cm then the distance apart of [S1a and S1b] should be 1cm. Similarly for S2a and S2b, S3a and S3b]

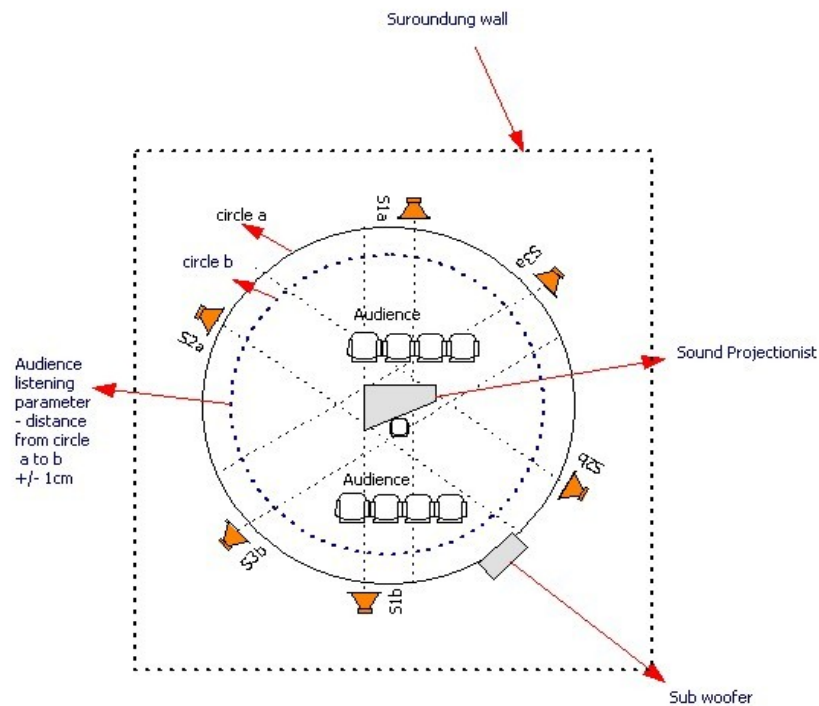


fig 8

- 1] 6 active audio speaker monitors and sub-woofer.
- 2] All channels to be positioned a +6 db throughout the performance.
- 3] A [EV]: 3070/7f is to be performed in total darkness [only minimal light for sound projectionist].

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