

Life Music: Sounding GRAZ

Musical Transformation modeled after John Conway's "Game of Life" (1970)

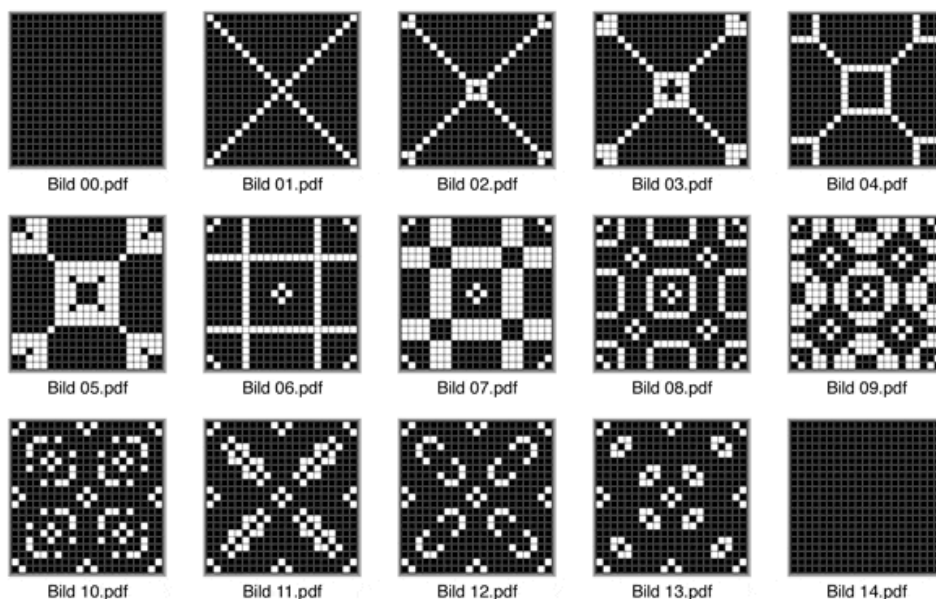
0. Introduction

The first ideas for the project developed in 2001 while listening to concerts played at the "CUBE", Graz, Styria, a concert room covering a space of 120 qm, with a height of 4,5 m, equipped with a 50 channel sound system utilizing 80 speakers.



1. Summary

Life Music uses Conway's „Game of Life“ (a cellular automata) for structuring the sonic material. The cell grid of the „Game of Life“ is applied to a map of Graz and also to the walls and ceiling of the Cube with its loudspeakers. The evolving pattern of the „Game of Life“ controls selection, volume and movement of sound.



2. „Game of Life“

Life Music uses a 21 x 21 grid with connected borders – a "glider", moving from the middle, after crossing the left border and leaving, enters the grid again crossing the right border.

The "actors" are patterns like the St Andrews cross, Bild 01; the patterns development only follows the simple rules of the „Game“, stating for the next generation:

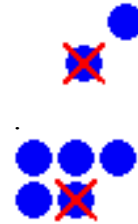
a) Every empty cell with exactly three non-empty neighbour cells turns into a non-empty cell;



b) every non-empty cell with 2 or 3 non-empty neighbour cells stays non-empty;



c) in every other case, the cell stays or turns into an empty cell.



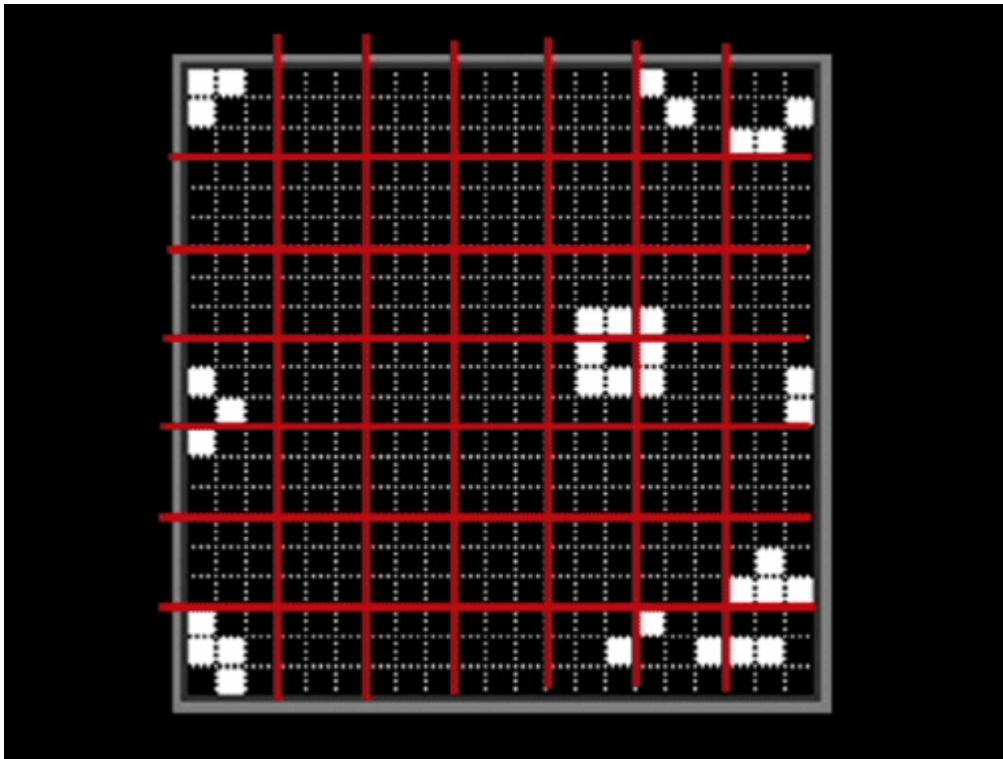
3. Graz city map

Divided into 7 x 7 cells with each cell corresponding to a 3 x 3 „Game of Life“ grid. Every cell uses its own audio sample of app. 10 seconds, recorded at a place in Graz corresponding to the grid cell on the town map. Recorded were ambient noises, not comprehensible or recognizable sounds, the noise our brain excludes from conscious perception.



4. Cube

The Cube also uses a 7 x 7 grid; so 49 sound channels are used, every channel controlling one sample corresponding to its position on the map. The sample volume is generated using the 3 x 3 grid: all cells empty = volume 0, 1 – 9 non-empty cells representing 9 volume levels from lowest to highest.



5. Performance

The „scenes“ are represented by 49 text files with numbers describing the volume changes over time. A PD-patch loops the 49 samples, sets the volume levels and shows the corresponding image of the current pattern on a video beam.

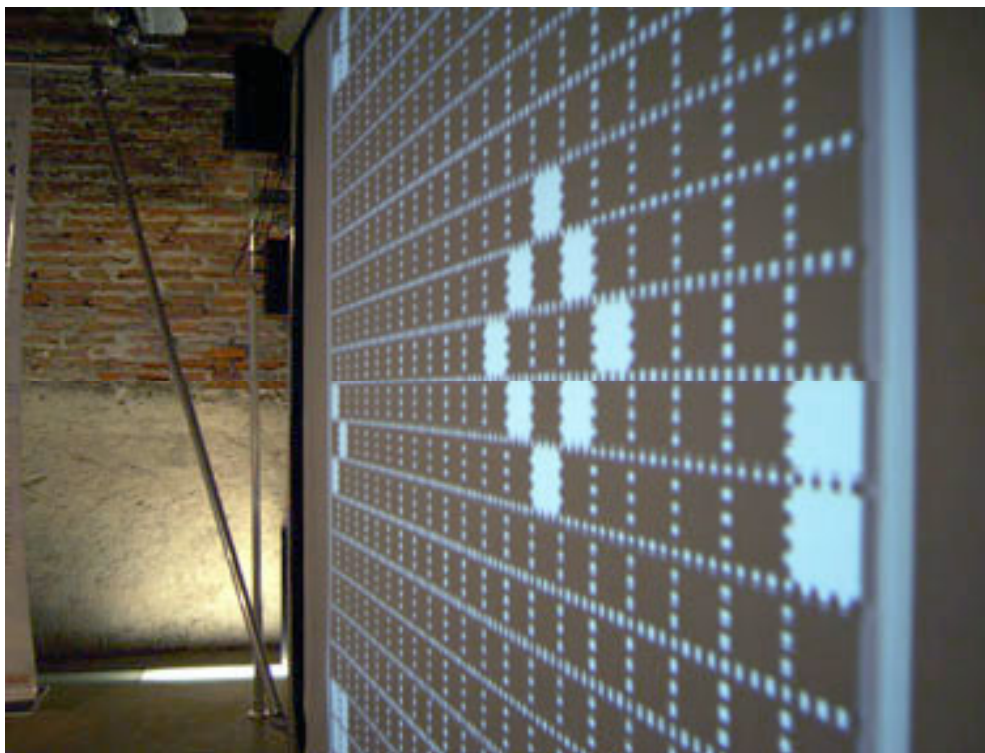
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
137	0	0	0	0	0	1	0	0	0	0	0	5	6	4	1	1	0	0	5
138	0	0	0	0	1	0	0	0	0	1	3	0	5	2	1	0	0	3	
139	0	0	0	0	0	0	0	0	0	2	5	1	3	1	2	0	1	3	
140	0	0	0	0	0	0	0	0	0	2	1	2	3	0	1	0	1	2	
141	0	0	0	0	0	0	0	0	0	0	0	2	3	1	1	0	0	2	
142	0	0	0	0	0	0	0	0	0	0	0	2	4	1	2	0	0	0	
143	0	0	0	0	0	0	1	0	0	0	0	2	3	0	3	0	0	0	
144	0	0	0	0	0	0	3	0	0	0	0	3	5	1	3	0	0	0	
145	0	0	0	0	0	0	2	0	0	0	0	3	2	1	3	0	0	0	
146	0	0	0	0	0	0	4	0	1	0	0	3	1	1	2	0	0	0	
147	0	0	0	0	0	0	2	0	1	0	0	5	0	1	1	0	0	0	
148	0	0	0	0	0	0	2	0	1	0	0	5	1	1	0	0	0	0	
149	0	0	0	0	0	0	0	0	1	0	0	4	3	2	1	0	0	0	
150	0	0	0	0	2	0	0	0	0	0	0	1	0	0	0	0	0	0	
151	0	0	0	0	0	1	0	0	1	0	0	3	3	2	1	0	0	0	
152	0	0	0	0	0	1	1	0	0	0	0	4	3	2	1	0	0	0	
153	0	0	0	0	0	1	1	0	1	0	0	3	3	2	2	0	0	0	
154	0	0	0	0	0	1	1	0	1	0	0	5	6	2	2	0	0	0	
155	0	0	0	0	0	1	1	0	1	0	0	1	2	2	3	2	0	0	
156	0	0	0	0	0	1	1	0	1	0	0	3	3	2	3	0	0	0	
157	0	0	0	0	0	2	1	0	1	0	0	5	4	3	2	0	0	0	
158	0	0	0	0	0	2	1	0	0	0	0	4	5	6	2	0	0	1	
159	0	0	0	0	0	3	0	0	0	0	1	4	3	3	2	0	0	2	
160	0	0	0	0	0	4	2	1	0	0	0	2	2	5	4	1	0	0	1
161	0	0	0	0	0	3	3	1	0	0	0	1	5	0	2	2	0	0	0
162	0	0	0	0	1	3	2	0	0	0	0	2	4	1	1	2	0	0	1
163	0	0	0	0	0	6	4	0	0	0	0	3	3	2	0	0	0	2	
164	0	0	0	0	1	1	3	0	0	0	0	2	3	2	0	0	0	0	1
165	0	0	0	0	0	1	3	0	0	0	0	2	5	2	0	0	0	0	0
166	0	0	0	0	1	2	3	0	0	0	0	2	2	3	0	0	0	0	0

6. Realisation

"Life Music" was made possible by the Institute of Electronic Music and Acoustics, University of Music and Dramatic Arts Graz (KUG). The work was financed by SKE/Austro Mechana. The 49 location recordings were made in November 2004 by Günther Albrecht and Andreas Platzer. First performance at the IEM CUBE was on March 8th 2005. The 5.0 - recording of this event was the material to a DVD utilizing the audio and the images.

7. Further performances:

- As "Live Life Music" with Günther Albrecht (synth, CUBE playback) and Franz Schmuck (percussion) playing live with the 49 CUBE-channels. (26. 5. 2005, **V:NM Festival Graz**).
- Screening of the DVD and Lecture on the 12. 2. 2006, **Super.net: cuisine digitale**, MuseumsQuartier.
- "Life Music 8-channel-version" at **Klangprojektionen (4/7)** Wiener Musikuniversität, Mai 15th 2007.
- Screening of the DVD at **VISUAL RHYTHMS** on 10.10.2007, The Sheppard Bar, London.
- "Life Music" DVD as an installation at the exhibition **1.x-tended**, 20. to 28. 10. 2007, Stadtkeller Neulengbach.
- Screening of the DVD at the **A10 medialab launch () RE IBOOT**; - Opening of Area 10 Project Space Peckham, April 12th, 08 Eagle Wharf, London.
- Screening of the DVD at the Festival **ElectroMediaWorks '08**, Mai 14th - 18th, Athens, Greece.



8. Literature:

“Wheels, Life and Other Mathematical Amusements” by Martin Gardner. Freeman & Company, 1983.
“Cellular Automata Machines” by Tommaso Toffoli and Norman Margolus. MIT Press, 1987.

9. Links:

<http://www.math.com/students/wonders/life/life.html>
<http://www.math.ucdavis.edu/~dean/life.html>
<http://www.homes.uni-bielefeld.de/achim/gol.html>
<http://www.canb.auug.org.au/~dbell/>
<http://www.trevorrow.com/lifelab/index.html>
<http://www.abarnett.demon.co.uk/life/index.html>
<http://www.radicaleye.com/lifepage/>
<http://fano.ics.uci.edu/ca/>
<http://entropymine.com/jason/life/>
<http://www.argentum.freemove.co.uk/life.htm>
<http://home.interserv.com/~mniemiec/lifepage.htm>
<http://members.aol.com/lifeline/life/lifepage.htm>
<http://www.iem.at/>

<http://visual-rhythms.blogspot.com/>
<http://1.x-tended.net/>
<http://soundhome.mur.at/>

Dr. John Conway is a professor of Finite Mathematics at Princeton University.

