

# Research > COMPOSING WITH PROCESS: PERSPECTIVES ON GENERATIVE AND SYSTEMS MUSIC

Generative music is a term used to describe music which has been composed using a set of rules or system. This series explores generative approaches (including algorithmic, systems-based, formalised and procedural) to composition and performance primarily in the context of experimental technologies and music practices of the latter part of the 20th Century and examines the use of determinacy and indeterminacy in music and how these relate to issues around control, automation and artistic intention.

Each episode of the series is accompanied by an additional programme, entitled 'Exclusives', featuring exclusive or unpublished sound pieces by leading sound artists and composers working in the field.

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Written and edited by Mark Fell and Joe Gilmore. Narrated by Connie Treanor. Exclusives by Laurie Spiegel and Terre Thaemlitz.

Mark Fell is a Sheffield (UK) based artist and musician. He has performed and exhibited extensively at major international festivals and institutions. In 2000 he was awarded an honorary mention at the prestigious ARS Electronica, and in 2004 was nominated for the Quartz award for research in digital music. He recently completed a major new commission for Thyssen-Bornemisza Art Contemporary, Vienna which premiered at Youniverse, International Biennal of Contemporary Arts, Sevilla. He is currently working on a research project at the University of York UK funded by the Arts and Humanities Research Council looking at independent practices in radical computer musics. www.markfell.com

Joe Gilmore is an artist and graphic designer based in Leeds (UK). His work has been exhibited at various digital art festivals and galleries. His recorded works have been published internationally on several record labels including: 12k/Line (New York), Entr'acte (London), Cut (Zürich), Fällt (Belfast) and Leonardo Music Journal (San Francisco). Joe is currently a part-time lecturer in the department of Graphic Design at Leeds College of Art & Design. He is also a founder of rand()%, an Internet radio station which streamed generative music. http://joe.qubik.com

# COMPOSING WITH PROCESS: PERSPECTIVES ON GENERATIVE AND SYSTEMS MUSIC #4.2

Exclusives

Each episode of this series is followed by a special accompanying programme of exclusive music by leading sound artists and composers working in the field. This show presents two works, the first by American composer Laurie Spiegel, followed by an excerpt of the soundtrack of a theatre play by American composer Terre Thaemlitz.

# **01.** Playlist

## 01:49 Laurie Spiegel 'A Harmonic Algorithm', 2011 (20' 24")

This is the third incarnation of 'A Harmonic Algorithm', a computer algorithm that composes music that I first coded up on my Apple II computer about 1980. A few years earlier at Bell Labs, it had occurred to me, while writing my first FORTRAN IV to make musical decisions, that if a composer creates individual 'pieces of music' that at the end of his/her life there will only be a finite number of musical works by that composer<sup>1</sup>. If instead of composing individual, finite length works, a composer could encode in computer software their personal compositional methods, preferences, processes and ways of making musical decisions, and somehow their aesthetic sensibility too, then they could go on composing and generating new music long after the biological human had ceased to exist. New music could continue to appear that would be uniquely that composer's. But of course it turns out that the composer writing the algorithm is a strong factor in the mix, so this piece turns out to be a merging of Bach and Spiegel's musical selves. I hope you'll be able to hear that true blend that is what this musical work must inevitably be.

In figuring out this particular logic, I spent a lot of time studying the harmonic progressions in Bach's Chorales, on which I based this software. I had happened upon a wonderful used book, *The Contrapuntal Harmonic Technique of the Eighteenth Century* (Allen Irvine McHose, 1947) that was extremely helpful to me while figuring out the logic I coded into these algorithms<sup>2</sup>.

I created what you will hear here on a pair of Macintosh computers. My old Mac SE ran the C language software and output MIDI notes to my current MacBook Pro, which provided the orchestration and recorded the resultant audio to its hard drive. You are hearing a non-interactive run. That is, once I started the program running, I did not interact with it or touch the computer at all until I stopped it at an arbitrary time (as you'll hear). Given computers that would never break down and an ongoing supply of electricity, each of such compositional processes could theoretically go on playing forever, as long as no one presses the key that tells them to stop.

The two earlier versions of 'A Harmonic Algorithm' can be heard on my CDs *Unseen Worlds* (the mid-eighties Macintosh version) and *Obsolete Systems* (the original Apple II version, which was written in the Apple PASCAL language). The (now three) versions differ mostly be how they are orchestrated, the first using square waves (bit toggling), the second an FM MIDI synth, and this third instrumentation that I selected on my computer intuitively by plain old fashioned preference (by ear).

I've always meant 'A Harmonic Algorithm' to be part of a series of algorithms based on roughly this same model of music theory space. I have only written two of them satisfactorily so far but hope to add more to the series to ultimately create the full work  $AMO^3$ .

For those interested, my paper describing the theoretical basis of the Harmonic Algorithm is at http://retiary.org/ls/writings/sonic\_subsets.html.







[Laurie Spiegel]

<sup>1</sup> I had found myself wishing I could discover new works by long-dead composers whose music I loved but already knew too well to be able to have the pleasure of first hearing of any of their music.

<sup>2</sup> A compositional algorithm is basically just a set of rules, a description in an artificial computer language of a process of decision-making, a sort of a written 'score' that embodies a procedure for composing, except that instead of humans playing from that score, a machine does.

<sup>3</sup> For *A Musical Offering*, after Bach, on whose work they are based.

## Laurie Spiegel, New York City, Sept 19, 2011

## 22:16 Terre Thaemlitz 'Substitution (Part 3: Questions)', 2011 (11'47")

Artists: Terre Thaemlitz (sound) / Eszter Salamon and Bojana Cvejic (words). Featuring the voices of: Sasa Asentic, Joanna Bailie, Terre Thaemlitz, Tracee Westmoreland, Chrysa Parkinson, Gérald Kurdian, Michael Schmid, Ragna Aurich, Eleanor Bauer, Polina Akhmetzyanova, Sayaka Kaiwa, Bérengère Bodin and Patricia Barakat. From the theater play *Tales of the Bodiless*.

'Substitution (Part 3: Questions)' was produced for Eszter Salamon's latest stage production, *Tales of the Bodiless: Musical Fiction Without Science*, which was also published as a tri-lingual book with CD (EN/FR/GR) by Botschaft Gbr. I produced sound for two of four sections in the 75 minute piece. The performance itself occurs within a theater, with visuals (projections, video, controlled smoke and air) and a custom 17-channel spatialized sound system that is readjusted for each performance environment.

The section from which this piece is taken, 'Substitution', tells the story of a world 'in which sexual differences are replaced by the difference between the bodiless and those who still have bodies, who are 'bodiful''.

In relation to the COMPOSING WITH PROCESS' theme of *Time*, I thought this piece was appropriate for it's narrative-yet-anti-climactic attitude towards composition, and the way in which this asks listeners to adjust expectations around both 'theatrical' and 'musical' performance.

### **Terre Thaemlitz**

## **02.** Biographies

#### Laurie Spiegel

Composer Laurie Spiegel's music draws on her classical training, pre-classical lute and folk banjo roots, but she is also a computer programmer, software designer and visual and video artist and often-published theorist. She is known worldwide for her pioneering work with several early electronic and computer music systems. Her focus with them has been largely on interactive software that use algorithmic logic as a supplement to human abilities, and on the aesthetics of musical structure and cognitive process.

Her best known work includes her seventies music from the GROOVE Hybrid System at Bell Labs, early work in the online transmission of digital music, a realization of Kepler's *Harmony of the World* that went up on the Voyager spacecraft's golden record, and *Music Mouse – An Intelligent Instrument* for Mac, Amiga and Atari computers. Although she is often grouped with the Minimalists due to the modal, drone and rhythmic aspects of her early LP *The Expanding Universe*, her recent music is often considerably darker and more complex, as her later CDs *Unseen Worlds* and *Obsolete Systems* show. She lives and works in Lower Manhattan since the seventies, and has taught at Cooper Union and NYU, where she founded the computer music studio in 1981.





[Terre Thaemlitz]

## **Terre Thaemlitz**

Terre Thaemlitz is an award winning multi-media producer, writer, public speaker, educator, audio remixer, DJ and owner of the Comatonse Recordings record label. Her work combines a critical look at identity politics – including gender, sexuality, class, linguistics, ethnicity and race – with an ongoing analysis of the socio-economics of commercial media production. He has released over 15 solo albums, as well as numerous 12-inch singles and video works. Her writings on music and culture have been published internationally in a number of books, academic journals and magazines. As a speaker and educator on issues of non-essentialist Transgenderism and Queerness, Thaemlitz has lectured and participated in panel discussions throughout Europe and Japan. He currently resides in Kawasaki, Japan.

## **03. Related links**

Laurie Spiegel

http://retiary.org

#### Laurie Spiegel Interview

http://www.tokafi.com/15questions/interview-laurie-spiegel/

*Sonic Set Theory: A Tonal Music Theory for Computers* http://retiary.org/ls/writings/sonic\_subsets.html

## Terre Thaemlitz

http://www.comatonse.com

Tales of the Bodiless: Musical Fiction Without Science www.eszter-salamon.com/WWW/talesofthebodiless-CD.htm

## **04. Acknowledgements**

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## 05. Copyright note

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