



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Each episode of the series is accompanied by an additional programme, entitled 'Exclusives', featuring exclusive or unpublished sound pieces by leading sound artists and composers working in the field.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

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 Biennial 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](http://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 #5.2

## 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 episode presents two contrasting generative works by American composer Ben Vida and network group THE HUB.

### 01. Playlist

#### 02:31 Ben Vida 'hy.morf.eld' 2011 (19' 17")

Intended for playback at a medium volume through speakers. Headphone playback is not recommended.

The first summer I was living in New York, St. Thomas Church in mid-town held a series of afternoon organ recitals featuring the works of Olivier Messiaen. What I liked about hearing these pieces live was experiencing the complexity and physicality of the organ's overtones as they gathered in the high ceilings and low corners of the church. These were pieces that I had listened to on record, but it wasn't until hearing them in this setting that I really found my way into them. I had a similar experience hearing Morton Feldman's 'Crippled Symmetry' performed live for the first time. I was a fan of his recordings, but again, it was the way that the sonic materials of this piece coalesced in the performance space that illuminated the complexities of the work's harmonic and timbral elements. The recordings I had heard of this same composition did not reveal how this music was capable of activating and changing a listening space and thus the listener's relationship to the composition.

This 'activating' of the listening space is often true of live performance, but the reason these two examples stick out is because of the sound sources these compositions utilize, pipe organ for the Messiaen and flute, vibraphone and piano for the Feldman – instruments that produce timbres that have the qualities of sine and triangle waves. I am interested in the informal additive synthesis that occurs in the performance space, the distortions and interferences and the spatialization that happens when these non-or-low harmonic producing wave shapes blend and add with the resonance of the space. My intention with 'hy.morf.eld' is to recreate this effect of activation found in live performance through the recorded medium. The focal point of this music shifts between external and internal emanation sources and works to transform the sonic space of the room where it is played. This is a music that at times activates the inner ear of the listener, producing DPOAE's (which create pitches that are literally produced and projected from the inner ear of the listener and not an audio speaker). At other times these pitch combinations create tonal interference, harmonic distortions, beating tones and textures that are heard through the speakers. By engaging the listener's sense of aural perception and sound localization, over compositional structure, I seek to reframe the listening experience and encourage an engagement with, not only the form and aesthetic of the music, but the sonic space a recorded piece of music projects.

The harmonic elements of 'hy.morf.eld' are based on shifting overtone series with changing fundamentals. The individual sine wave voices are grouped into four sets of two (a root note and second-thru-octave). These are tuned to just intoned intervals that are capable of producing Distortion Product OTO Acoustic Emissions (DPOAE). These four sets, each with their own automated envelopes, are combined with two sets of two voiced sweeping tones, also tuned to produce DPOAE materials. All phrasing, melody, and harmonic relations were created generatively. These generative elements are very simple and develop out of rhythmic phasing. Only a handful of root note choices have been programmed for each pair of sine waves. Sonic complexities lie in the shifting overtones that are created by the use of just intoned tuning systems. The coupled sweeping sine



[Ben Vida]

waves help to complicate the overtone series as they ascend through the chords, highlighting microtonal relationships. A number of different iterations of this patch were recorded and then edited and sequenced to aesthetic compositional ends.

The digitally synthesized materials were used as control sources to automate and define the parameters of an analog modular synthesizing system. Through the use of vocoder analysis the audio realization of the digital process was analyzed and translated into control voltage. This CV was patched throughout the modular system controlling triggers, gates, envelope rates and pitch determination. All sound materials were produced using Max/MSP and a Eurorack analog modular synthesizer. Recorded and mixed on a MacBook Pro.

### 23:24 THE HUB 'VAV' 2008 (35' 05")

'VAV' was inspired by congruencies between associations of the hebrew letter vav and the musical practices of THE HUB. The association of vav with the principle of connection is embodied in a music in which every sound is connected to every other one through the exchange of binary data (bits). The association of vav with a pillar, and of the six spatial pillars of three-dimensional space, is represented in the spatial movement of sound, encoded ambisonically to ascend in trajectories towards a middle point, centered and above the installation floor. The association with the number six is reflected in the six players of the group who provide six sound sources for the piece, that plays through six loudspeakers of the surround installation. 'VAV' creates a meditative, three-dimensional soundscape entirely from mathematically synthesized sound that reflects on the symmetries of space and time, concealment and revelation.

All the sounds and textures in this work were produced live by computer synthesis as a result of algorithmic interactions defined in the composition. Multiple live takes were edited and assembled into a 35 minute fixed media version of the piece, that was designed to loop continuously. Each of the six players programmed their computer instruments to play either percussive or continuous sounds that vary timbrally from pure, harmonically tuned tones to noise, and that move in three-dimensional space. After playing each sound, a player pauses, then sends a trigger to another player to play a sound, and the piece consists of chains of these playing/triggering interactions. Each trigger message also includes data for one of the parameters that was used to set the frequency, timbre, or duration of the sound just played. This parameter is generated by the player by a simple process like sampling a low frequency oscillator whose speed and range are controlled manually. This data must then be used by the receiving player in implementing their next sound; the group's overall sound thus evolves in a network dependent way, providing development that ripples gradually through the ensemble. One player can reset the ensemble's state with a 'cue message', that provides a new unison data set from which to begin a new evolution. There is also an exceptional state, where any player can withdraw from the network, and play freely.

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## 02. Biographies

### Ben Vida

Ben Vida is a composer, improviser and sound artist. Ben has worked in collaboration with artists Siebren Versteeg, Doug Aitken, Hisham Bharoocha, Nadia Hironaka and Mathew Suib. As an improviser he has performed with Milo Fine, Fred Lonberg-Holm, Taku Sugimoto, Kevin Drumm, Yamatsuka Eye and C. Spencer Yeh among many others. He has played in ensembles led by Tony Conrad, Rhys Chattam, and Werner Dafeldecker. In collaboration with Keith Fullerton Whitman and Greg Davis he has explored cross control voltage integrated improvisation and real time automatic group composition. Ben led the group Town and Country and has released over twenty records on such labels as Thrill Jockey, Drag City, PAN, Amish, Bottrop-Boy, Hapna and Kranky. Awards and residencies include an Illinois Arts Council Grant for composition (2006), The Swedish Arts Grants Committee (2011), ISSUE Project Room



[The Hub: from left to right, Chris Brown, Scot Gresham-Lancaster, Mark Trayle, Tim Perkis, Phil Stone, and John Bischoff]

Emerging Artists Commission (2011), Composer in Residency at Diapason Space in New York (2011) and Composer in Residency at EMS Studios, Stockholm (2011), among others.

#### THE HUB

**John Bischoff** has been active in the experimental music scene in the San Francisco Bay Area for over thirty years as a composer, performer, and teacher. He is known for his solo constructions in real-time synthesis and the pioneering development of computer network bands. He was a founding member of The League of Automatic Music Composers (1978) and he co-authored an article on The League's music that appears in *Foundations of Computer Music* (MIT Press 1985). He was also a founding member of the network band THE HUB with which he has performed and recorded from 1985 to the present. In 1999 he received an award from the Foundation for Contemporary Performance Arts (New York) in recognition of his music. Recordings of his work are available on Artifact, 23Five, Lovely, and Tzadik. He is currently an Associate Professor of Music at Mills College in Oakland, California.

**Chris Brown** is a composer, pianist, and electronic musician, who creates music for acoustic instruments with interactive electronics, for computer networks, and for improvising ensembles. Collaboration and improvisation are consistent themes in his work, as well as the invention and performance of new electronic instruments. These range from electro-acoustic instruments (*Gazamba*, 1982), to acoustic instrument transformation systems (*Lava*, 1992), and audience interactive FM radio installations (*Transmissions*, 2004, with Guillermo Galindo). In 2005 he created 'TeleSon', a composition for two ReacTable instruments performed in a joint concert between Ars Electronica in Linz, Austria and the International Computer Music Conference in Barcelona, Spain. Recordings of his music are available on Tzadik, Pogus, Intakt, Rastascan, Ecstatic Peace, SIRR, and Artifact labels. As a performer he has recorded music by Henry Cowell, Luc Ferrari, José Maceda, John Zorn, David Rosenboom, Larry Ochs, Glenn Spearman, and Wadada Leo Smith; as an improviser he has recorded with Anthony Braxton, Pauline Oliveros, Fred Frith, Rova Saxophone Quartet, Ikue Mori, Alvin Curran, William Winant, Biggi Vinkeloe, Don Robinson, and Frank Gratkowski, among many others. He teaches at Mills College in Oakland, California where he is co-director of the Center for Contemporary Music (CCM).

**Scot Gresham-Lancaster** is a composer, performer, instrument builder and educator with decades of professional experience. His recent work is for IMéRA in Marseilles on second order sonification of data sets. As a member of THE HUB, he is one of the early pioneers of computer network music and has created new forms mobile media performance with cellphonia.org, the cell phone operas. He has created a series of co-located international internet performances with remote dancers and musicians. He is an expert in twenty-first century educational technology and techniques.

**Tim Perkis** has been working in the medium of live electronic and computer sound for many years, performing and recording in North America, Europe and Japan. His work has largely been concerned with exploring the emergence of life-like properties in complex systems of interaction. In addition, he is a well known performer in the world of improvised music, having performed on his electronic improvisation instruments with hundreds of artists and groups, including Eugene Chadbourne, Fred Frith, Elliott Sharp, Leo Wadada Smith and John Zorn. Perkis is also producer and director of a feature-length documentary on musicians and sound artists in the San Francisco Bay area called *Noisy People* (2005).

**Phil Stone** is a musician, computer programmer and instrument designer from Davis, California. From the days of the single-board microcomputer to the present, he has explored the interface between digital logic and live music performance. He studied experimental music with Alvin Lucier, Nic Collins, and Paul DeMarinis at Wesleyan University and with David Rosenboom at Mills College. Stone was a co-author of some of the earliest MIDI (commercial computer music) software, supported research in virtual reality and spatial auditory display at NASA-Ames Research Center, and is a senior programmer/analyst for the University of California, Davis.



He is an original member of the computer network music ensemble THE HUB and also performs regularly live computer music for the Laura Pawel Dance Company of New York. He writes all of his own music software, using the Free Open Source graphical programming language Pd. He has designed two synthesizers in Pd which he has made publicly available at his website (<http://www.pkstonemusic.com>).

**Mark Trayle** studied composition with Robert Ashley, David Behrman, and David Rosenboom at Mills College. He works in a variety of media including live electronic music, installations, improvisation, and compositions for chamber ensembles. Recent collaborators include Muhal Richard Abrams, Boris Baltschun and Serge Baghdassarians, David Behrman, Toshi Nakamura, and Wadada Leo Smith. He teaches in the School of Music at CalArts.

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### 03. Related links

Ben Vida  
<http://benvida.blogspot.com>

THE HUB  
<http://crossfade.walkerart.org/brownbischoff/index.html>

John Bischoff  
[www.johnbischoff.com](http://www.johnbischoff.com)

Chris Brown  
[www.cbmuse.com](http://www.cbmuse.com)

Scot Gresham-Lancaster  
<http://about.me/scotgl>

Tim Perkis  
[www.perkis.com](http://www.perkis.com)

Phil Stone  
[www.pkstonemusic.com](http://www.pkstonemusic.com)

Mark Trayle  
[http://en.wikipedia.org/wiki/Mark\\_Trayle](http://en.wikipedia.org/wiki/Mark_Trayle)

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### 04. Acknowledgements

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### 05. Copyright note

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