

Reviews

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Events

Sónar 2005: Advanced Music and Multimedia Art

Barcelona, Spain, 16–18 June 2005.

*Reviewed by Joyce Shintani
Stuttgart, Germany*

In the gamut of European multimedia festivals, from Ars Electronica in Linz, Austria to Transmediale in Berlin, Germany, Barcelona's Sónar is the most resolutely dedicated to music and is also the largest. In 2005, the 12th annual International Festival of Advanced Music and Multimedia Art took place on 16–18 June and welcomed 90,000 visitors from 40 countries and some 800 accredited journalists. The difficulty of writing about the three-day marathon of sun, electronic music, and (chemically induced) good vibes that is Sónar is notorious, and one of the reasons is the sheer abundance and crossover diversity that Sónar presents.

From its inception in 1994, Sónar has provided a space for artists, professionals, and the public to meet and exchange points of view. Wikipedia makes a distinction between "electronic music" and "electronic art music" ("Electronic music is a loose term for music created using electronic equipment." "Electronic 'art' music is a regrettably vague term for

the formal and primarily academic branch of electronic music that is focused on extending musical capabilities through technology."), but Sónar embraces both. The theme this year was a "return to the physical in the expression of live music." The undisputed "soloists" of earlier Sónars, portable computers, have been replaced by guitars, drums, pianos, and voices. With 300 activities including DJ sets, live sets, visual and multimedia art, conferences and discussion forums, a record fair, an editorial fair, merchandising and hardware exhibitions, live broadcasts, and archives at individual viewing stations, the festival's programs embrace the multitude of styles and media in electronic music today. And that is another reason it is difficult to write about Sónar. Under a sensorial attack of Las Vegas-like intensity, at some point the visitor longs for, or is offered, sense-numbing substances, placing high demands on the most scrupulous professional discipline.

The festival is divided into two parts, each with its principal venues: Sónar by Day takes place largely in the CCCB/MACBA complex (Barcelona Center for Contemporary Culture and Museum of Contemporary Art) and in the Santa Monica Art Center, and Sónar by Night takes place at the vast convention center, Fira Gran Via, on a hilltop above town. Sónar's secret to success lies in combining mainstream electronic/hip-hop acts of mass audience appeal with experimental underground electronica and electronic art music. The well-organized festival thus attracts crowds as well as cognoscenti, who all mingle at the sun-drenched festival and enjoy a wide variety of Barcelona's other attractions: endless tapas bars, beaches, and a considerable off program, all at reasonable prices.

Sónar by Night is the venue for big

names, this year including acts like De La Soul, Ellen Allien, Jamie Lidell, Laurent Garnier, Miss Kittin, and the Chemical Brothers. These events have been amply reviewed by the international press, and I leave commentaries to those specialists and aficionados (one link to a more mainstream review of the festival can be found at www.soundgenerator.com/burner/reviews_live.cfm?reviewid=1077).

Sónar by Day provides spaces for the experimental films, multimedia installations, and exhibits that define Sónar's artistic identity and that will be the focus of this review. I begin with SonarMàtica, where one finds installations and contemporary art comparable to Germany's documenta, New York's Guggenheim or Los Angeles's MoCA (Museum of Contemporary Art); or, as one visitor put it, "similar to the Tate Modern, but more cutting edge." In their fine exhibit "Randonée (A Walk Through Landscaping in the 21st Century)," curators Óscar Abril Ascaso, José Luis de Vicente, Andy Davies, and Advanced Music made out a return of abstraction to the forefront of contemporary creation after years of pop art. Based on this view, they sought to analyze "the extent to which landscape art is currently surviving in new media." The exhibits were wide-ranging, with entries lacking only from African and Middle Eastern countries. Considering Spain's vicinity to the African littoral, selections from these geographical areas, with which a dialogue is so desperately needed, would be an appropriate complement in future. Many of the installations have won prizes at other festivals, for example Thomas Köner's "Suburbs of the Void" (reported in a review of the Transmediale Festival, Berlin, in *Computer Music Journal* 29[4]). Three works particularly caught my attention for

their artistic density and the close relationship between audio and visual elements.

In her award-winning film *Aspect* (2004), Emily Richardson undertakes a quick-motion filming of a forest over a year. Films of this type are familiar; the technique is often used in nature films or to depict completion at construction sites. Unusual in Ms. Richardson's film is her successful accommodation of visuals to Benedict Drew's soundtrack of organic sounds. She closely interweaves images and sound with quiet sensitivity, and the resulting work is captivating with its simple natural beauty and poetic soundscape.

An extreme contrast to Ms. Richardson's view of nature is Yi Zhou's *OneOfTheseDays* (2004), a 3-D animation reconstructing the filmmaker's dream about a civil war in an undefined futuristic city—equally poetic, but chilling (her Web site is found at www.yi-yo.net). Inspired by the construction and demolition taking place in her native Shanghai, the work is a stylized representation of destruction that has similarities with the gun fight in *Matrix* (chapter 29, "Freeze!"). Both are held in shades of gray and depict cool, anonymous futuristic architecture. Both utilize slow motion and a breath-taking deployment of scattering fragments from destroyed buildings. But where the *Matrix* scene is short and embedded in action, Yi-Zhou's vision of destruction is longer and cooler, and, being removed from narrative, is reduced to its aesthetic elements. The floating, ethereal soundscape underlines the work's dream quality, eliciting cold shivers of awe.

A final work, *Tree* by Risc (a.k.a. Christian Rieckoff) succeeds at employing music and visuals in equal, minimal quantities. While maintaining a distant connection to the landscape theme of the exhibit, the work

falls into the category of software art. The viewer points to a URL on a wall-projected computer screen and presses Enter. In real time, *Tree* accesses the source code of the Web site and transforms its syntactic structure into the image of a tree with trunk, branches, and ramifications in subtly shaded geometric forms. At the same time, simple MIDI data is generated (producing, at Sónar, crystalline tones based on high/low frequencies with short/long durations), providing a slightly whimsical accompaniment that is a good correspondence to the simple geometric shapes. It is a fun application that gives a satisfying aesthetic result; you can try it yourself online (www.texone.org/tree; this Web-based version lacks the MIDI output).

Also at the CCCB complex was SónarCinema, an extensive collection of experimental cinema and video clips. Ten viewing sessions, each lasting approximately an hour, showcased works featuring historical as well as current formats of audiovisual creation providing persuasive "testimony to the ever increasing common ground between the image and advanced music."

The first highlight was a selection of short films produced by the Groupe de Recherches des Images (GRI), a collaboration of musicians and filmmakers in the 1960s under the auspices of Pierre Schaeffer and the Groupe de Recherches Musicales (GRM), that explored new television forms. Most of the 700 shorts were never broadcast and "ended up in the state archive because they were conceptually too radical." These unique audiovisual experiments feature soundtracks by Iannis Xenakis, Bernard Parmegiani, François Bayle, Ivo Malic, and Pierre Schaeffer, which render audible the historic continuity of beats and scratches from the 1960s to the present.

In another session, *Chronopolis*, by Polish artist Piotr Kampl with music by Luc Ferrari, was shown, a concrete experiment screened at the Cannes Festival in 1982. Many of the sessions offered electronic music clips or works by video jockeys in a wide variety of styles and quality. A final highlight, *Pimp My Bite*, was a compilation of works produced using digital video, 3-D animation, Flash, and machinima (films shot in the virtual reality of a game engine) from the Hamburg Bitfilm Festival (www.bitfilm-festival.org). Many of the films were unmitigated social criticism, but the short *Kunstbar* (2002) by The Petrie Lounge provided first-class comic relief. In this imaginative spoof on high art made in primitive South Park style, different drinks are served at the Art Bar, producing varying results: the Van Gogh cocktail causes an ear to drop off, the Hieronymus Bosch drink is real torture, and so on (this film can be viewed online at www.whitehouseanimationinc.com/kunstbar.htm).

From the CCCB complex it is a 15-min stroll down the bustling Ramblas, Barcelona's central walking boulevard, to the Santa Monica Center. There, downstairs in the dark, cool basement, diverse projects and live software acts from around the world were presented, including a bizarre performing robot (www.myrobotfriend.com). Upstairs, in the exhibit space, the installation "Messa di voce" by Golan Levin and Zach Liebermann with Jaap Blonk and Joan La Barbara was particularly eye-catching (www.tmema.org/messa). It is an audiovisual system consisting of viewer space with camera tracker, microphones, and wall projection for the sounds, produced by the viewers, which have been transformed in real time into interactive visualizations. Using the mics, the viewer can create, then using hands catch and bal-

ance “virtual” bubbles or galaxies of color on the wall projection. This is a sophisticated installation that hints at serious themes of meaning and the effect of speech sounds in a playful and delightful way.

Another part of the festivities, *Antiliteratur*, the “Art and Literature Festival,” was plagued by wrongly posted times for its sessions and, regrettably, I missed them all. At *Sónar*, missing some events is unavoidable, but discovery is also part of the experience. My happiest discovery was Phil K (www.philk.dj) at the demonstration of the DVJ-X1 DVD/CD turntable, Pioneer’s answer to the iconic turntable. Familiar DJ techniques—scratches, loops, instant cues, fades—are now possible for one-person simultaneous disc and video jockeying (DVJ), enabling on-the-fly mixing from separate audio and visual sources.

Phil Krokidis, a veteran Melbourne DJ/producer of Greek descent, demonstrated not only the new hardware but also his own considerable talent. An autodidact who, by his own account, as a youth “couldn’t play an instrument but could mix,” Phil has recently worked with the Pioneer Research and Development team to develop the new DVJ-X1. Although he is new to visuals, he says he now “watches movies like he used to listen to records,” and the results show that Phil K not only has huge ears, but also fantastic eyes. He employs video art or simple clips he shoots on his travels, images that conjure up and comment on urban culture (New York street scenes), politics (George Bush, Arab sheiks, and guns), or the role of women (animations). Although the club context calls for high intensity video streams, Phil K’s selection and controlled use of a few key images at timed intervals creates meaning within the constant flow of color—a message within the mas-

sage. To achieve this he begins, in typical DJ manner, by laying down a visual loop. Under it, layer by layer, he slowly constructs a sound structure, which may also include sampled concrete sounds. At specific points along the way he inserts the images that form his commentary, and the audience follows, rocking. The visual/sound-narrative grows, and when the swell reaches its high-point, Phil K places the musical climax. No conductor or classic virtuoso could do so with better timing. The crowd cheers and rises to its feet, but Phil K ends the structure and lays down a new loop on the level just reached and takes off again. VDJ and crowd interact, building intensity over a 50-min set, and only with reluctance did they clear the scene for the next act. The formal strength in composition of Phil K’s work is manifest. The figures, spoken words, and clips, both drawn from samples as well as finished works, interplay at various levels and create their own syntax. Phil K’s art is intuitive and touches on deep emotions. Pulsing with an urban energy recalling Jean-Michel Basquiat, he mirrors glimpses of a fragmented society and submits them to the organizing principle of music. His way of making art in the club context is a contribution to the best of what electronica offers today.

Before summing up the *Sónar* Festival, let us recall some of the elements that make electronica different from other kinds of popular music, beginning with its name. The artists—DJs, vocalists, and instrumentalists—are all working with a powerful generation of electronic instruments that affords them liberty in many areas. Evolving high-quality synthesis and microprocessors continue to generate new media. Equipped with such mobile creative potential, electronica artists have

opened up their ears to exploit the new technological possibilities at their disposition. They sample, then “play with”—manipulate, vary, permute—not only the sounds they generate, or buy on a historic record, new CD, or download, but also from the world around them. This great variety of sources brings freshness into their work and the work of VJs. Electronics also allows freedom on the economic side. Own-your-own electronic distribution and small independent labels eliminate certain market constraints. Released from contracts with music majors that dictate shareholder-value productions, and, knowing that their constituency is listening for new sounds, electronica artists are willing to take risks and have thereby created a field with high creative dynamism. And in yet another way electronica artists are open: often without formal music training, DJs are not hampered by ears full of aesthetic expectations or composition rules. Driven only by their curiosity and excitement for the world of technology and sounds, young DJs have trekked through electronic music’s beginnings with John Chowning, Karlheinz Stockhausen, and Pierre Schaeffer, through jazz and chance and John Cage, and through a maze of rap, dance, and world music styles in the 1980s and 1990s. Moving across boundaries of education, geography, medium, style, genre, or time is as natural for them as breathing; they’re on a collective creative high.

After the sensory glut of three days of *Sónar*, what trends for the future does the juxtaposition of experimental music with hot acts reveal? The elements listed above combined with the instant global connectedness of the Internet emphasized at festivals like *Sónar* has led to cross-fertilization and an explosion of creativity, in stark contrast to shrinking

classical concerts or the implosion of the music industry. Within the creative burst of electronica, two developments were obvious at Sónar. First, as the organizers have pointed out, there is a return to the physical: electronic music has learned performance. Increasing real-time capacity, women performance artists, and vicinity to the dance floor have firmly established the performing body in electronica. Second, as audiences have grown and software has become more robust, DJs have perfected their improvisatory talents in order to interact with audiences. A tradition that survived in jazz and rap is returning to electronic music: the improvising artist. These trends give DJ-ing electronica a vital, electric quality lost from the museums that concert halls have become. High technological standards, burgeoning creativity, and a lively, growing public—this year at Sónar, electronica cast an appreciative glance at its electronic roots and went raving off in myriad future forms.

NIME 2005: New Interfaces for Musical Expression

University of British Columbia, Vancouver, British Columbia, Canada, 26–28 May 2005.

Reviewed by Jamie Allen, Margaret Schedel,† and John P. Young‡*
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This year's New Interfaces for Musical Expression conference, NIME 2005, was held at the University of British Columbia in Vancouver, Canada, 26–28 May. Although practically everyone disagreed about the pronunciation of the name of the conference, everyone agreed that Sid-

ney Fels and Tina Blaine did a wonderful job of coordinating the event. The spaces for papers and performances were physically and acoustically beautiful, and the weather was perfectly gorgeous, which made it a pleasure to walk from the dorm-like accommodations through the campus to the various venues.

Thursday May 26, Reviewed by Jamie Allen

There was a refreshing preamble to the official commencement of NIME 2005. Wednesday night before the official welcome session the next morning, early arrivals were treated to a showing of *The Future is Not What It Used to be*, a film by Mika Taanila presented by Michael Lyons. The film was a real treat, outlining the extensive accomplishments and contributions of Finland's obscure electronic arts pioneer Erkki Kurenniemi. Mr. Taanila's film also hinted at an emphasis on historical and contextual underpinnings that I noticed throughout the proceedings this year.

Three separate keynote speeches were given during each morning of the conference, an aspect of the event that was particularly well planned. Each of these was a retrospective look at the speaker's own work, and their perspectives on the road ahead. The nearly sublime triumvirate of Don Buchla, Golan Levin, and Bill Buxton truly represents a triumph of curatorial talent and orchestration on the part of the conference planners, Sidney Fels and Tina Blaine.

On this first morning, Mr. Buchla presented and demonstrated a panoply of the instruments he has constructed since 1965. The number of demonstrable instruments he was able to bring was limited somewhat by Canada customs agents, but his corner of the demo room was still

well stocked. The keynote was fascinating, especially for those of us with leanings towards fetishism for synthesizer and analog memorabilia. He capped his remarks with comments on modern advancements and work in hardware design. This included mention of a very recently completed design by Bob Huott known as the "Been." Its mention was a surprise even to the designer, as the instrument is so new, confirming that Mr. Buchla's attentiveness to his chosen field has not waned in over 45 years of practice.

The morning session of paper presentations began with a look at more conceptual treatments as contrasted to specific applications, which were covered in the afternoon. John Bowers and Phil Archer presented "Not Hyper, Not Meta, Not Cyber but Infra-Instruments." The presentation covered much of Bowers and Archer's work and called for a restriction of interactive potential in new instruments (NIMEs). Essentially, it was a well-formulated argument for "keeping it simple." The lesson was a profound and important one for the audience at hand, that sometimes the most expressive musical outcomes are derived from seemingly less-expressive interfaces (Infra-Instruments). "Reductionist" Japanese work and "circuit bending" performance successes prove that Infra-Instruments are as much a part of the novel ways people are expressing their musical voice as the most belabored virtual reality application or re-engineered violin.

Three researchers from Helsinki's University of Technology came next, presenting a set of experiments in sound control done within a Virtual Reality environment. Identifying with the largely synesthetic leanings of North American computer music composers and researchers, they gave a concise description of the CAVE en-

vironment and input interfaces, standard in virtual reality (VR) circles but novel in their application to the musical domain. The work did not seem geared to performance contexts, but to the context of a singular user, creating and interacting with a virtual instrument or sound world. As with all presentations of immersive systems, I would have liked to experience the VR system in its entirety myself, as video and photographic documents rarely do them justice.

The three paper presentations that followed were discussions of instrument systems that have progressed beyond experiments. The first of these was from Gil Weinberg and Scott Discoll, now at the Georgia Institute of Technology, with "iltur." Centered on the Beatbug musical controllers developed at the Massachusetts Institute of Technology Media Lab, iltur is a system for interaction between novice and expert musicians. Two jazz compositions, *iltur 1* and *iltur 2*, have been developed, and the first of these was performed at the 2004 International Computer Music Conference. The implementation and motivation of this work is consistent with Mr. Weinberg's fine reputation. As an artist and scholar, he seems fittingly concerned with issues of accessibility and the transmission of ideas.

A review of more mature applications was presented by Sergi Jordà, outlining paradigms and applications of multi-user interfaces for music. He took a new tack on the issues by rigorously analyzing the multi-user taxonomy of a piano, guarded most commonly as a single-user instrument.

The spirited Tina Blaine finished off the morning sessions by outlining a remarkable collection of multi- and single-user commercial musical interfaces from the Interactive Enter-

tainment world. She spoke largely within the context of the educational potential of interfaces for music from the video game and toy industries.

Her examples ranged from pop-culture phenomena such as Dance Dance Revolution and Donkey Conga to the Eye-Toy video-tracking game Groove, which provides a gestural rhythm controller to the masses. Ms. Blaine was also kind enough to bring a Donkey Conga system to the demo rooms in Vancouver that day, so we might all get a chance to sample the gaming industry's take on a new musical interface. I am always impressed by the industry's attitude to musical interface implementations, being, for the most part, devoid of excessive pretence and valuing human experience beyond issues of compositional authority or technical prowess.

Those of us attending the afternoon paper sessions were treated to descriptions of specific interfaces systems and rigorous applications. These were clear and succinct presentations of successful present practices of reactive and interactive musical systems. Dan Overholt presented the Overtone Violin, which was performed at a concert the next evening. Juan Pablo Caceres and his team from the Center for Computer Research in Music and Acoustics (CCRMA) were a crowd favorite: an augmented tuba system was presented, wherein real-time manipulation of the natural instrument sound was amplified and retransmitted through loudspeakers mounted on the bell of the instrument, and a subwoofer beneath the player's chair.

Eric Singer's presentation of a LEMUR (League of Electronic Musical Urban Robots) "Large Scale Networked Robotic Musical Instrument Installation" project installed at the University of California at Irvine was saddled by two new sensor acquisi-

tion and control systems. The first of these was the Smart Controller Workbench, which allows for interactive programming without the need for a computer. The second was a novel system by the team behind the Tap Tool Max/MSP add-on set, entitled the Teabox. The Teabox uses an underused asset of most audio acquisition hardware systems, the S/PDIF protocol, to get sensor data into the computer, all mounted in truly roadworthy case.

The concert roster on Thursday night included a videoconference performance organized by Scot Gresham-Lancaster. *AB_time*, the title of the piece, featured Tomi Hahn dancing along to decidedly meandering textures from three locales: our concert hall at UBC; Pauline Oliveros on her accordion in Troy, New York; and Jean-Marc Montera playing the cittern in Marseilles, France.

The clear sonic triumph of the evening was next, with Italian-born Vancouver local Giorgio Magnanensi controlling a set of circuit-bent speech synthesizers (most from the Texas Instruments "Speak & Spell" line-up). Seated at the center of the room, Mr. Magnanensi proved once again that the physical and visual elements of a performance are not always paramount. He spoke to the audience through his contorted machines in ways the circuitry never intended and we did not expect.

Randall Jones took to a Tactex multi-touch control pad after Mr. Magnanensi, effortlessly painting a complex language of visuals on a screen above his head. The visual material and linked audio material was flawless in its synesthetic synchronicity, although at times the sound material seemed a bit thin as a counterpart to the imagery. *Posthorn*, by Ben Neill and Bill Jones, was a fine reworking of Gustav Mahler's *Sym-*

phony No. 3 into atmospheric lapping through Mr. Neill's self-designed "mutantrumpet." Laetitia Sonami lent her unusual blend of theatrical showmanship and finessed interface design, performing her "Lady's Glove" gestural controller in a piece entitled *The Appearance of Silence (The Invention of Perspective)*.

The first evening's concerts were rounded out by a much-talked-about collaboration between renowned Cuban jazz pianist Hilario Duan, percussionist Andrew Schloss, and violinist Irene Mitri. Mr. Schloss uses a Radio Drum system to effect and re-digest captured portions of the pianist's playing, although on this occasion the sonic material being actuated by the percussionist seemed a little less enticing. Midi-synth bongo and conga samples didn't make for fitting accompaniment to Mr. Duan's playing and Ms. Mitri's ruminations on strings seemed slightly out of place in it all.

A standout aspect of this year's NIME conference was the inclusion of improvisation sessions, organized by Ajay Kapur of the University of Victoria. These were held at various times throughout the three days, and despite some confusion with regards to how "open" these sessions in fact were (many people reportedly hoped to show up, instrument in hand, when in fact one had to sign up for an allotted session prior to the conference), they were certainly a step in the right direction. I was lucky enough to participate in one such session, and whatever the overall musical outcome, there is certainly value in organizing more activities where music is the explicit conversant language at a conference centering on music. I would have loved to see a full-on jam, for example, involving all the lovely controllers and sound makers that Don Buchla carted up from California. Music is, after all, for many of us still

a less cumbersome means of communication than the unwieldy awkwardness of the English language.

*Friday May 27, Reviewed by
Margaret Schedel*

I thought the most successful presentations were those that combined a paper or poster with a performance. I know that it isn't feasible to have a one-to-one correspondence between papers and performances, but I do believe the composers/creators of pieces selected for performance should have an automatic option to have a poster. There is only so much information one can convey in program notes, and it would be nice to have a centralized discussion about the technology behind a work. I was much more receptive to the aesthetics of a performance when I wasn't trying to figure out the technology.

Roger B. Dannenberg, Ben Brown, Garth Zeglin, and Ron Lupish authored the paper "McBlare: A Robotic Bagpipe Player," which describes the technology behind the piece performed later that night. The robot consists of a custom-built air compressor and electro-mechanical relays connected to rubber pads which open and close holes on the chanter in response to MIDI messages. Mr. Dannenberg's musical work *McBlare* was a joyous racket of trills and runs faster than any human could have played. He wheeled their creation out on stage, turned on the compressor, and stood back to watch it work with a slightly bemused expression on his face. Thankfully, he had earplugs in. The piece itself was a mélange of Scottish folk motifs which translated very well into MIDI, perhaps because (forgive me, Roger) the bagpipe is not the most expressive of musical instruments. The work was, however, very musically satisfying, and the audience gave it a thunderous cheer.

Dan Overhold also had a paper and piece: his *Duet for Violin + Violinist* and corresponding paper dovetailed nicely. As mentioned above, Mr. Overhold presented his paper on Thursday, and it was rewarding to see the violin, which was described in such technical terms, turn into an expressive instrument onstage the next evening. The performance was nearly half over before he actually bowed a note on the string; most of the performance consisted of gesture control, and I felt it was a bit unbalanced. The overtone violin has six strings and I wished for more amplified acoustic sound—the lower strings especially had a dark and subtle timbre. This piece was another that married folk elements, in this case fiddling, with technology.

Suguru Goto's *VirtualAERI II* used another violin controller, the SuperPalm, a virtual violin. Unlike the Overtone Violin, the SuperPalm does not have actual strings; it models the gesture of violin performance, using touch sensors instead of strings on the fingerboard and resistance sensors on the bow. In addition to these sensors there is an eight-button keyboard on the body of the instrument. Mr. Goto is a natural performer, and his gestures were musically sensitive. It seemed that the sensors did not always work—sometimes a large gesture did not have a corresponding reaction in the sound or interactive video. Nonetheless, there were some very beautiful moments with the performer silhouetted against a wash of abstract video while a thick sound evaporated into the hall.

Ulrich Maiss and Joseph "Butch" Rován in *Return of the Habaneros* and *Hopper Confessions*, respectively, also used gesture to great effect in their works. With Mr. Maiss on cello and Mr. Rován on bass clarinet the audience had a great time listening to two European free-jazz—

influenced works. They had a lot of fun onstage together in *Return of the Habaneros* at points playing air cello and air clarinet; Mr. Maiss also used that energy to good effect in his solo performance of Mr. Rován's work. I have seen *Hopper Confessions* a number of times now, and I thought this was one of the best performances.

It was refreshing to see so many interactive performances that did not involve people hunched over laptops. Toichi Nagashima's *Wiggle Screamer II* was a fun example of the Japanese approach to this aesthetic challenge. Wearing sensors on his arms and using a light harp interface, Mr. Nagashima entertained the audience with a pop-inspired pentatonic confection. At times it was a little like looking at a virtuosic Dance Dance Revolution performance as boxes on the screen moved in time to his arm slaps while MIDI bells played.

Mocap Performance Instrument, by R. Luke DuBois, Luiibo Borrisov, and Beliz Demicioglu, used both motion-capture information from a studio and live video-tracking in a work for dancer with interactive music and video. The video consisted mainly of abstracted line drawings from the motion-capture sessions, some of which were more pleasing than others. The piece had no real hard edges—the dancer trailed scarves of sound behind her as she moved and it was very soothing to hear the piece come to rest after the dancer stopped moving. I wasn't sure if the sounds were recorded noises of dancer friction, but it seemed that way to me and it was a compelling way to bring the sonic world closer to the dance world.

I would have liked to see a performance using David Topper and Peter V. Swendsen's "Wireless Dance Control: Pair and WISEAR," a general purpose interface to a wide variety of sensors and gestural controllers. De-

veloping a flexible and powerful system for tracking dancers has been a challenge, and I am looking forward to using their product that combines a small LINUX-based wearable single-board computer with a wireless transmitter. Users solder in their own sensors, and the computer can be powered by 7-V batteries.

Other research that may be applicable for motion tracking has been done by Alain Crevoisier and Pietro Polotti. "Tangible Acoustic Interfaces and their Applications for the Design of New Musical Instruments" describes a technique whereby using only audio signals a computer can detect contact points of users interacting with the surface of solid materials. The resolution was astonishing from using just two piezo contacts. Sadly, there was not enough time to set up a demo of this "acoustic holography," but I am just as excited as the authors to be able to create controllers out of any surface.

Many papers this year seemed to specifically reference NIME. I'm not sure if the authors submitted only to NIME, or if they tailored their papers accordingly, but I was a little disturbed by the amount of conference referencing going on in the papers. Sageev Oore's "Learning Advanced Skills on New Instruments (Practising Scales and Arpeggios on your NIME)" was one such paper, yet I found its contents compelling. Much is made of new instrument design, but often not enough time is taken to practice the new instruments. I am eagerly awaiting the next Clara Rockmore, whichever new musical instrument she might play.

Saturday May 28, Reviewed by John P. Young

The final day of the conference kicked off with a keynote presentation from Bill Buxton, a man with

strong opinions based on decades of experience as a researcher in computer music and human-machine interaction. He made his position clear from the start, stating that tape playback sucks as a performance idiom, and that sitting behind a laptop computer screen mousing around is more or less the same thing from an audience perspective. This particular religious war has been well flogged already, but it still seems to be a good way to get everyone's attention early in the morning. And Mr. Buxton backs up his gauntlet-throwing unusually well. He noted that the transition from analog to digital sound gained stability and predictability, but lost a wealth of interesting controller interfaces and thus an important immediacy of engagement with manipulating sound while performing. He described various environments he has worked on, emphasizing that the interfaces were purpose-directed, optimized for the task at hand, be it composition, orchestration, or performance, expanding the notion of context-sensitivity to include the entire interface rather than just a few tools or menus as is most often the case today.

One graphic user interface (GUI), in an application called "Scriva," had some useful features that aren't readily available anymore, such as an amplitude-context piano roll display and multiple flavors of notation that could be toggled for differently weighted views of musical events: score, Music V code, timbre clusters, etc. Another performance GUI displayed multi-dimensional parametric control data on a single screen, oriented toward real-time adjustments of tempo, amplitude, filtering, etc., using a tablet "mouse" as well as reflecting parameter mapping to other tactile continuous controllers. These clearly valuable, extinct features reminded us that there are many excellent ideas

out there that have already been validated but continue to languish waiting for someone more interested in exceptional design than reinventing the wheel in their own image.

Mr. Buxton went on to assert that it is critical for performance instruments and systems to have the capacity to adapt between different acoustic environments, i.e., concert halls, in order to create comparable exceptional musical experiences for audiences in any space. Later he discussed the advantages of a virtual control console based on a large touch-sensitive tablet, with cardboard cut-out overlays emulating sliders, buttons, and other structured controls, allowing simple switching between controller layouts for various purposes using a single piece of fairly simple hardware. Having impressed us with the depth of his thought and decades of work on the subject, he ended by reinforcing his initial assertion that just like sound itself, gesture is a language underpinning the relationship between performer(s) and audience. Mastering that gestural dialogue is essential to creating a theater of performance, that environment in which the inspiration of musicians feeds the exhilaration of audience and back again in wonderful reciprocity. Documentation of much of Mr. Buxton's work can be found at his Web site (www.billbuxton.com).

The morning paper session, "Voice, Gestural Control and Multimodality," was relatively entertaining, always a bonus for those of us who eschew imbibing massive doses of caffeinated beverages, and a couple of presentations in particular stood out. Elliot Sinyor showed off his "Gyrotyre," a small (30 cm) bicycle tire attached to a hand grip, able to spin freely around its axis, with a wealth of attached sensors including rotational speed, dual-axis acceleration,

gyroscopic orientation, and force-sensing in the grip. Some basic mappings showed that the controller could be fun to use as well as fun to watch. Michael Lyons demonstrated sonification of facial expressions, which was not only hilarious but also showed potential for meaningful interpretive mappings as the system evolves towards finer granularity and integrative analysis of multiple expressive features. It will be exciting to see the potential of these innovative interfaces applied to more musically sophisticated purposes.

The afternoon paper session, "Learning, Tools + Connectivity," showcased some interesting projects as well. Art Clay discussed "Going-Publik," a distributed coordinated collaboration using handheld electronics. Essentially, the participant performers use wearable computers as instrument and global positioning system (GPS) tracking interfaces, with a dynamic score projected on their eyepiece monitors as they traverse a city. Niels Böttcher then presented "Connecting Strangers," an attempt to create spontaneous sonic interactions between passengers waiting on opposite train platforms. The project team tried several approaches to balancing the imperatives of being sufficiently accessible to learn and enjoy within a few minutes's time, with enough challenge to hold participant interest after they "figured it out." The interactive aspects of the work turned out to be the most difficult, with additional work and experimentation planned to encourage players to not only explore their own "side" of the sound, but cooperate across the tracks as well. Mark Havryliv described "Pocket Game-lan," essentially a cross-compiler that can translate a Pd patch seamlessly into Java 2 Micro Edition (J2ME) code for deployment onto a mobile phone or other portable de-

vice that supports J2ME. He demonstrated live conversion of several fairly complex patches and successful testing in a desktop emulation environment, an already impressive feat that will surely become even more so with further refinement.

Saturday evening's concert began with Thomas Ciufo's *Beginner's Mind*, shakuhachi slowly fading in, maintaining a sense of time being stretched and extended, with a haunting sustained atmospheric environment throughout. Then *Cybersong* by Paulo Maria Rodrigues, Luis Miguel Girão, and Rolf Gehlhaar took us in a decidedly more dramatic direction. A static noise began with house lights still up—technical difficulty or beginning of the piece?—then Mr. Rodrigues walked down the house right aisle, donning a tux jacket as he mounted the stage. A grand "O freunde!" yielded to falsetto sostenuto which then recycled through electronics in an eclectic cascade of conscious chaos. A later section turned into a hilarious remix of the recited text: "A fish is a machine that preserves genes in water. A monkey is a machine that preserves genes up trees." This segued into manipulation of "radio" waves via clownish mouthpiece. Overall, the piece was disjointedly non sequitur, but brilliantly performed, concluding with maniacal laughter building through feedback to a final "Shut Up!"

Next came Elaine Chew performing Ivan Tcherepnin's *Fêtes (Variations on Happy Birthday)* as an interlude, eloquently played. It seems a little dangerous to include compelling purely acoustic work on the same program as highly experimental material, as the inevitable comparison underscores just how great a journey we have left ahead of us. *Ye Ying Di* [Nightingale Floor] by Margaret Schedel, in collaboration with video artist Charles Woodman and choreog-

rapher/performer Alison Rootberg, started with a strikingly costumed Rootberg all in white, arms and legs illuminated in patterns of neon wire, gently and gracefully unfolding in front of projected video. The movement and imagery combined evocatively at times, with real-time capture of the dancer's glowing lines sensitively blended into the mix. However, due to limitations of the stage setup, it was difficult to cognitively integrate the dancer and the background into a coherent union. Discerning the relationship between Ms. Rootberg's movement and her influence on the sound and video was also challenging, in part because there was clearly something so almost there that I yearned to feel a satisfying connection instead of just giving up on the idea. Having seen this work a few times before, I was aware that many of the wonderful elements I had previously witnessed were not entirely operational for some reason, which left me wishing that this audience could have experienced more of its full intention. Even though we have learned to be forgiving when it comes to new music, it's always a shame when technical issues restrain the artistic blossoming of a lovely piece.

Jamie Allen attacked what appeared to be a suitcase full of noise in *boomBox*, to great theatrical effect. It might be a stretch to call it music, exactly, but it was tremendously expressive, surprisingly funny, and highly entertaining from beginning to end. Afterward, David Birchfield on sensor-extended percussion and Curtis Bahn on electronically enhanced vertical bass performed *Improvisations*, a structured exploration of the capabilities of their instruments and the relationships between them. While both players are very skilled and sensitive, somehow here they seemed to be inhabiting completely different,

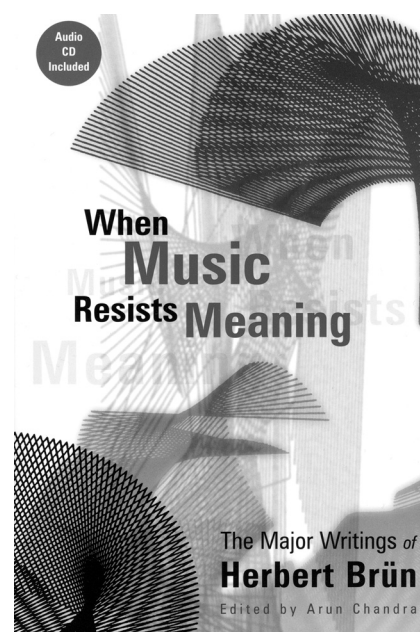
incompatible sound worlds, with the timbres simply refusing to gel. This might have been less problematic if the sounds had been warmer and more inviting in general.

Finally, Dan Trueman performed *BoSSA Studies*, three short pieces for his Bowed-Sensor-Speaker-Array instrument. The first, *Vocalise*, sampled Mr. Trueman's voice through headset microphone as material for transformation and manipulation. The second piece, *Lobster Quadrille*, is becoming a classic, a setting of the poem from Lewis Carroll's *Alice in Wonderland*. The composer-performer persuasively showed how a very satisfying intuitive connection can be forged between gesture and sound, even in a fairly abstract relationship such as "playing" text samples with violin technique. The last piece, *Tetha*, included Tomie Hahn performing shakuhachi. The acoustic and electronic spaces integrated well, with the shakuhachi plainly the dominant element, the BoSSA seeming to function primarily as effect and atmosphere. Unfortunately, near the end Ms. Hahn began barking and then things went swiftly downhill, leaving me to wonder why so much electroacoustic music forms contrast against lyricism by playing the crazy card. Is it discomfort with using our medium as a means of expressing serious sentiment, or are we really all just that wacky?

Publications

Arun Chandra, Editor: *When Music Resists Meaning: The Major Writings of Herbert Brün*

Hardcover/softcover, 2004, ISBN 0-8195-6669-1/0-8195-6670-5, 350



pages, illustrated, CD-Audio, US\$ 70.00/29.95; Wesleyan University Press, 215 Long Lane, Middletown, Connecticut 06459, USA; telephone 860-685-7711; fax 860-685-7712; Web www.wesleyan.edu/wespress; distributed by University Press of New England, Order Department, 37 Lafayette Street, Lebanon, New Hampshire 03766, USA; telephone 800-421-1561 or (+1) 603-643-7110; fax (+1) 603-643-1540; Web www.upne.com/0-8195-6669-1.html.

Reviewed by Ross Feller Oberlin, Ohio, USA

Born in Berlin in 1918, Herbert Brün left Germany and went to Palestine shortly after the Nazis assumed power. In Palestine he studied composition with Stefan Wolpe, Eli Friedman, and Frank Pelleg at the Jerusalem Conservatory. In 1948 Leonard Bernstein brought Brün to Tanglewood, in Massachusetts, to continue his studies. Shortly thereafter he attended Columbia Univer-

sity for a year of graduate work. From the mid 1950s until he finally settled in Illinois he worked at the now well-known electronic music studios in Paris, Cologne, and Munich, producing some of the earliest examples of non-serial electroacoustic music. He also gave lectures throughout Europe and the USA on the function of music in society.

In 1962, after one such lecture tour, Lejaren Hiller invited Brün to join the faculty of the University of Illinois at Urbana-Champaign. He accepted Hiller's offer in part because he wanted to work with the computer systems then available there. Brün entered a compositional environment that thrived on collaboration with other disciplines including electrical engineering, cybernetics, and cognitive theory. He co-taught courses with Heinz von Foerster on cybernetics, composition, cognition, and social change. Mr. von Foerster helped establish the field of cybernetics and, most importantly, developed the notion of a second-order cybernetics which focused on self-referential systems and behaviors. The concepts behind second-order cybernetics, such as von Foerster's slogan that, "The world, as we perceive it, is our own invention," resonated with Brün's own ideas about meaning and perception.

After taking over Hiller's Seminar for Experimental Music in the late 1960s, Brün began to implement some of his most radical formulations about music and language. He was also a conductor. Included in the many performances of contemporary music that he led are American premieres of György Ligeti's *Aventures* and *Nouvelles Aventures*. In the mid 1970s Brün helped the Computer Music Association get its start. He hosted conferences at the University of Illinois in 1975 and 1987, and was the keynote speaker at the 1985 con-

ference (held at Simon Fraser University, Burnaby, British Columbia, Canada).

With the recently published *When Music Resists Meaning: The Major Writings of Herbert Brün* by Wesleyan University Press, the opportunity arises for a re-assessment of Brün's many contributions to the world of contemporary music. His compositional and pedagogical practices were grounded in information theory, cybernetics, and dispersionist philosophy. He argued for the purposeful recognition of the social and political significance of composition, and against the tendencies of language to preempt thought. At the time of his death in 2000 Brün left behind a half-century's worth of compositions, playful and polemical texts, computer-generated artworks, and a group of zealously devoted former students.

In 1991, Brün and several of his closest students formed what is now called the School for Designing a Society, a non-affiliated institute based in Urbana, Illinois, dedicated to the critical examination of society, language, and music. Members of the school have collaborated and toured with Patch Adams, the famous clown-doctor and subject of a Hollywood movie starring Robin Williams. Though Brün's legacy mostly continues in the work of his former students, his thought has significantly impacted many other composers and performers throughout the world.

One of the primary functions of Brün's compositional praxis was to uncover possibilities for new significance, while opposing the reification of meaning inherent in the acts of recognition and appropriation. His thoughts on these matters are detailed in various essays, interviews, and prose pieces contained in *When Music Resists Meaning*, a wonderful

compendium of Brünian thought expertly edited and compiled by former student Arun Chandra. Several other former students ably assisted him. This project, clearly a labor of love for Mr. Chandra, began to take shape in 1985. His work consisted of everything from collecting and editing Brün's articles, interviews, and lectures to writing new output routines to generate Postscript code in order to print Brün's computer-generated graphics (several of which are reproduced in the book). He also helped produce the accompanying compact disc, which features performances of Brün's compositions by the LaSalle Quartet, pianist John Tilbury, percussionist Michael Udow, and the Percussion Group Cincinnati, along with three of his best-known electroacoustic pieces.

When Music Resists Meaning (WMRM) is divided into six sections: "Listening," "Composing," "Composing with Computers," "Cybernetics," "Poetry and Plays," and "Postlude: Appendices." The first two sections contain unpublished manuscripts and lectures, as well as a previously published essay and interview from *Perspectives of New Music*, a Guest Editorial from *Keyboard Magazine*, and an important essay, "For Anticommunication," that first appeared in *Words and Spaces: An Anthology*, edited by Stuart Saunders Smith and Thomas Delio (Lanham, New York: University Press of America, 1989).

In this latter essay, Brün lays out his argument for new music based upon an idea he terms "anticommunication," and describes how he attempted this in several of his compositions. Anticommunication is essentially a provisional device used in retarding the natural decay of information, which occurs when the process of meaning assignment, or *semiosis*, is stalled or comes to a

standstill. Brün defines anticommu-
nication as

an attempt at saying something,
not a refusal to say it. Commu-
nication is achievable by learn-
ing from language how to say
something. Anticommunication
is an attempt at respectfully
teaching language to say it. It is
not to be confused with either
noncommunication, where no
communication is intended, or
with lack of communication,
where a message is ignored, has
gone astray, or is simply not un-
derstood. Anticommunication is
most easily observed, and often
can have an almost entertaining
quality, if well-known fragments
of a linguistic system are com-
posed into a contextual environ-
ment in which they try but fail
to mean what they always
meant. (WORM, p. 63)

According to Brün, all musical ma-
terials, gestures, and forms inevitably
lose what might be called their free-
floating signification potential when-
ever listeners, composers, and/or
performers *fail* to anticommu-
nicate. This was no small matter in Brün's
world because he saw this as a move
from playfulness toward violence. He
held that "the insistence on commu-
nication ultimately leads to social
and physical violence . . . Anticom-
munication ultimately leads to the
insistence on composition and
peace" (from *My Words and Where I
Want Them*, p. 48).

The third and fourth sections of
WORM contain various essays about
computers and technology, first pub-
lished in books such as *The Com-
puter and Music*, *On the Wires of
Our Nerves: The Art of Electroacous-
tic Music*, and *Composers and the
Computer*. Brün covers a wide range
of topics relevant to composers of
computer music, including such

things as artificial systems, second-
order cybernetics, and algorithmic
composition.

The fifth section contains samples
of his aphoristic poems and playful
theatrical skits. The postlude con-
tains a brief biography, detailed lists
of Brün's compositions and publica-
tions, program notes he wrote for
many of his compositions, a techni-
cal description of his computer-
generated graphics, a short glossary of
terms, and a poignant essay entitled
"Paradigms: The Inertia of Lan-
guage," written by his wife, poet
Marianne Brün.

At times acerbic and hard-hitting,
WORM showcases the "brutally
charming" (the author's terminol-
ogy) notions that Brün first intro-
duced to his American colleagues
and students over four decades ago.
Ultimately, the sense of bewilder-
ment or alienation in his work
served to probe and extend his ideas
about freedom and human under-
standing. I close with a personal re-
membrance that is emblematic of
Brün's public discourse. I recall a
post-concert question and answer
session at the University of Illinois at
which a student pointed to one of the
composers and asked why he had
written such a "cold" and "calcu-
lated" piece. Before an answer was
given Brün turned toward the student
and said, "So, you listened without a
heart, did you?"

Herbert Brün's music is pub-
lished by Smith Publications (2617
Gwynndale Avenue, Baltimore,
Maryland 21207, USA; Web [www
.smith-publications.com](http://www.smith-publications.com)). His record-
ings are available from Centaur, Non
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For more information, consult the
Brün Web site (www.herbertbrun.org).

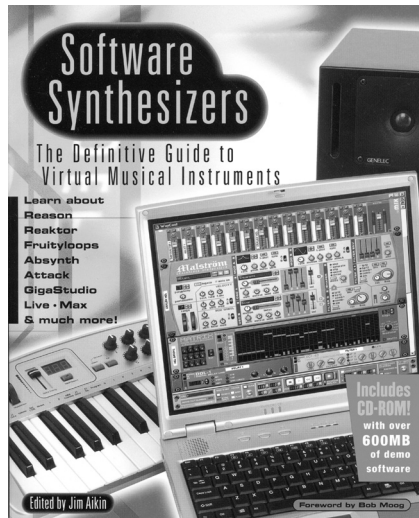
Jim Aikin, Editor: Software Synthesizers: The Definitive Guide to Virtual Musical Instruments

Softcover, 2003, ISBN 0-87930-752-8,
304 pages, illustrated, foreword by
Bob Moog, CD-ROM, US\$ 29.95;
Backbeat Books, 600 Harrison Street,
San Francisco, California 94107,
USA; telephone (+1) 415-947-6615;
fax (+1) 415-947-6015; electronic mail
books@musicplayer.com; Web [www
.backbeatbooks.com/](http://www.backbeatbooks.com/).

*Reviewed by S. Lyn Goeringer
Seattle, Washington, USA*

*Software Synthesizers: The Defini-
tive Guide to Virtual Musical Instru-
ments*, edited by Jim Aikin, is a
collection of product reviews from
Keyboard magazine. The focus of the
book is to introduce the reader to
some computer music/electronic
music products that are on the mar-
ket, provide insight into these prod-
ucts, and introduce the reader to
basic electronic music concepts by
providing simplified definitions for
concepts such as MIDI, FM synthe-
sis, and sampling rates.

The book has some immediate
limitations. The first and foremost is
that it is a collection of product re-
views for products that are either
now obsolete or have greatly evolved
since the initial publication of the
work. An easy example of how much
has changed is the book's statement
that Max/MSP does not run on Mac
OS X. It is important to remember
when reading this book that the spec-
ifications given for each product as
well as their pricing and availability
have changed a great deal in the past
few years. If you find yourself inter-
ested in any products discussed in
this book, it would be strongly ad-
vised to find out if the product is still
available, what its current specifica-



tions are, and what the current price is. This being said, however, the book does offer some useful information to the novice computer musician.

The format of the book is simple to follow, and the language is conversational. The book begins with simplistic definitions of what synthesizers are, how they can be implemented as software, and how these can apply to your home computer along with what other types of options there are. All of these discussions are laced with some amount of humor. When new concepts are introduced, Mr. Aikin provides a brief and simple explanation of terms. These explanations are not designed to teach you how to operate a specific device or how to fully understand a specific concern (such as the mathematical concept of floating-point), but merely to break down how to apply a rating or manufacture spec sheet to the functionality of a program. The final chapter of the book is perhaps the one most useful to the novice as it offers an easy-to-understand introduction to basic synthesis concepts.

The book is a collection of product reviews. Each chapter begins with a basic introduction of what types of

products are to be reviewed. The classes of items reviewed are: software that models its sounds on real instruments (such as the Steinberg Model-E Software Mini-Moog), virtual-analog suites (such as Native Instruments Absynth or the VirSyn Tera), virtual rack systems (Reason, Image-Line Fruityloops), sample players (Tascam GigaStudio, Ableton Live), design suites (Cycling '74 Max/MSP), and percussion modules (Waldorf Attack, Steinberg LM4 Mark II). There is only scant discussion of products such as Digidesign Pro Tools, Steinberg Cubase, Mark of the Unicorn Digital Performer, or Cakewalk Sonar. These are mentioned only to recommend them as host applications for plug-in "soft-synths" and as being an important aspect of home studio design. On the whole, the book is devoted to software that generates sounds, and is less interested in the sequencing and combination of sounds.

As noted, the reviews are collected from *Keyboard* magazine, and are basically reprints of articles. Where possible, Mr. Aikin has supplied information regarding changes from the time of an article's original print date. Each review follows a similar format: an overview of the product, a description of what happened when the reviewer ran the software through its paces, and what the opinion is of each reviewer.

The book comes with a DVD-ROM containing a collection of demonstration plug-ins from Ableton, Antares, Arturia, BitHeadz, IK Multimedia, LinPlug, Native Instruments, Propellerhead, Seer Systems, Software Technology, and VirSyn. The demos are for either Macintosh or Windows, with some software working on both platforms, and there are a few fully functional freeware programs provided, such as Soundforum Synth from Native Instruments.

For many of the programs, there are also MP3 files available so that you can hear what the potentials are for the software in its full format.

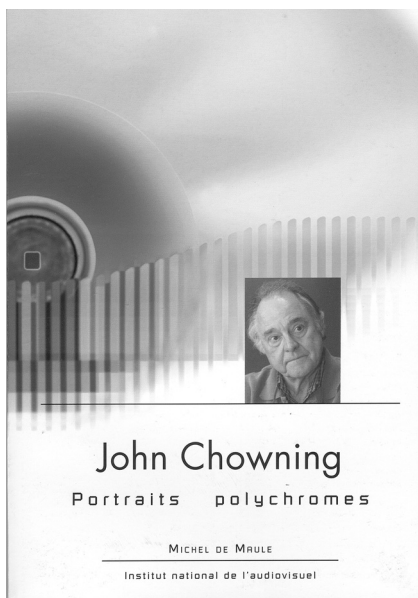
Though this book has many limitations, primarily the datedness of the reviews, it is useful for the novice as it offers great introductory information to what is involved in electronic and computer music, and it also provides detailed descriptions as well as easy-to-access demonstrations of software that has been available in the past (in many cases, versions are still available of these plug-ins). Whether the book helps one to purchase the various pieces of software discussed is less important than having access to information for what is possible, and in this the book offers some great overviews. It is much less useful for the moderate-to-advanced computer musician, as it is geared toward newcomers and the information is not current. It is possible to hunt down the reviews in the book by looking through archives of *Keyboard* magazine, though markedly less convenient.

Portraits Polychromes: John Chowning

Softcover, 2005, ISBN 2-87-623-164-6, 122 pages, €13; GRM Institut National de l'Audiovisuel, Maison de Radio France, 116 avenue du Président Kennedy, 75220 Paris, France; telephone (+33) 1-56-40-29-88; electronic mail grm@ina.fr; Web www.ina.fr/grm/acousmaline/polychromes; Éditions Michel de Maule, 41, rue de Richelieu, 75001 Paris, France; telephone (+33) 1-42-97-93-48.

*Reviewed by James Harley
Guelph, Ontario, Canada*

This slim volume on John Chowning is the seventh in the *Portraits poly-*



chromes series published by the Groupe de Recherches Musicales/Institut National de l'Audiovisuel (GRM/INA) in cooperation with the Centre de Documentation de Musique Contemporaine (CDMC). Other volumes in the series have highlighted Jean-Claude Risset, Luc Ferrari, Bernard Parmegiani, Gilles Racot, François Bayle, and Ivo Malec.

John Chowning's work is central to the field of computer music, but his publications and compositional output have been relatively sparse. For all his work on digital frequency modulation and spatialization, his efforts to establish and maintain the Center for Computer Research in Music and Acoustics (CCRMA) at Stanford University, and his mentoring of generations of computer musicians, this is the first volume entirely devoted to Mr. Chowning's life and work. One can only wonder at the state of things in America that such an important publication would arise only in France, and in French. Regardless, Daniel Teruggi, Pierre-Albert Castanet, and Évelyne Gayou

are to be lauded for their efforts in spearheading not only this volume but the whole series. If you do not read French yet, now would be a good time to start, as the *Portraits polychromes* series is an extremely valuable addition to scholarly resources on computer and electroacoustic music. In particular, I would note the innovative and highly informative Web sites connected to each volume (consult www.ina.fr/grm/acousmaline/polychromes and follow the links to the individual sites), which include, among other things, graphic analyses of selected pieces presented in conjunction with audio playback of the music. (It was on this site, for example, that I discovered that Mr. Chowning has just recently completed a new composition, *Voices*, his first since *Phoné* from 1981.)

This volume on John Chowning opens with an extensive interview with Évelyne Gayou, a composer associated with GRM/INA, serving there as Director of Publications. Over 18 pages, this interview covers much of his career, from his early studies with Nadia Boulanger, to his work at the Artificial Intelligence Lab at Stanford University, to the establishment of CCRMA, and so on. I was rather surprised to learn that Mr. Chowning had been turned down for tenure by Stanford in 1973. This was after he had published his work on FM synthesis! Luckily for the university, the decision was eventually overturned, and the millions of dollars in royalties from Yamaha thereafter accrued to the school's coffers, turning out, apparently, to be one of the most lucrative licenses in the university's history. In this interview, we are also reminded of the close connection between the work in computer music at Stanford and the establishment of the Institut de Recherche et Coordination Acoustique/Musique (IRCAM). Mr. Chowning served as a

consultant to Pierre Boulez and others during the planning stages of IRCAM, and spent time at IRCAM pursuing research on voice synthesis later. Indeed, IRCAM was in certain respects modeled on CCRMA, and the strong relationship established in the 1970s has continued. Notably, both *Stria* and *Phoné* were produced as a result of commissions awarded to Mr. Chowning by IRCAM.

After the interview, there is a short article by Mr. Chowning himself, dating from 2004, titled "Composer le son lui-même" [Composing the Sound Itself]. In six pages, the composer-researcher outlines his interest in creating sounds on the computer, making reference to the seminal work of Jean-Claude Risset. Rather than discussing particular synthesis methods, such as FM, he notes the possibilities for creating transformations of timbre by applying dynamic envelopes and vibrato to sinusoidal components of a sound.

Mr. Risset, who has known Mr. Chowning since meeting him at Bell Labs in 1968, has penned for this volume a lengthy article on his work, combining biography with technical exegesis. "Sur l'impact de l'oeuvre scientifique, technique et musicale de John Chowning" [On the Scientific, Technical, and Musical Impact of John Chowning] is a model of clarity and insight, and, at 28 pages in length, will no doubt long remain a crucial introduction to this important figure.

There follows a short article by Yann Geslin, "John Chowning: de l'informatique à la composition musicale" [John Chowning: from Computer to Composition], which situates Mr. Chowning's work in the context of succeeding generations of composers who have been able to carry on from his ground-breaking research and applications.

The remainder of the book con-

tains analytical discussions of Mr. Chowning's music. Laurent Potter presents an 18-page analysis of *Turenas* (1972). He outlines the structure, the canons that underlie parts of the piece, the spectral organization of the bell sounds, and the aleatoric rhythmic procedures used in various sections. In addition, he explains the paths of spatialization, the use of reverb, and details of the FM synthesis algorithm. Bruno Bossis presents a similarly detailed study of *Stria* (1977) in his 29-page article, "Stria de John Chowning ou l'oxymoron musical du nombre d'or comme poétique" [John Chowning's *Stria* or the Musical *Oxymoron*: The Poetics of the Golden Mean]. In his discussion, Mr. Bossis devotes useful space to an explanation of the Golden Mean and how Mr. Chowning applied it to FM synthesis and the creation of unique timbres and harmonic relationships. Mr. Bossis also contributes a very short discussion of *Phoné* (1981).

These analyses are augmented by the presentations on the associated Web site (cited above). Graphic outlines of the pieces are linked to audio recordings, enabling the listener to follow along. Being able to take information gleaned in the articles to the pieces themselves is of great value, in my opinion. One may be limited in terms of sonic quality (the audio on the Web is compressed), but the avid listener could then go on to the compact disc recording of the works (Wergo WER 2012-50), still available from various sources (such as cdmusic.org).

Each of the articles in this book includes bibliographic references, and the final two pages include a listing of articles authored by Mr. Chowning, interviews, and a few other items. I have no idea why an interview by Denis Mercier would be listed under "In Collaboration with

John Chowning" [En collaboration avec . . .] when another interview by E. Krick would be listed under "On John Chowning" [À propos de . . .]. In that category, cassette and phonograph recordings from IRCAM presenting *Stria* are listed as references, along with a biographical entry by E. Ruth Anderson. I doubt the audio items would be available anywhere outside of the IRCAM reference library, but hopefully they are at least accessible there.

In conclusion, this is a valuable study of an important figure in computer music. There do not appear to be any plans to publish an English version, but perhaps that is because we haven't requested it strongly enough! In the meantime, pull out your French-English dictionary, if you have to, and get started. And do check out the Web site at GRM; it's a great reference in itself (and there are plans to translate parts of it to English).

Douglas Spotted Eagle: Vegas5 Editing Workshop, 2nd Edition

Softcover, 2004, ISBN 1-57820-257-4, 447 pages, illustrated, with DVD-ROM, US\$ 49.95; Published by CMP Books as part of the Digital Video Expert Series, 600 Harrison Street, San Francisco, California 94107, USA; Web www.cmpbooks.com.

*Reviewed by Jim Hearon
Honolulu, Hawaii, USA*

This book is an update of *Vegas4 Editing Workshop*, and follows up on recent developments in the Vegas software, including Sony's HDCAM/DVCAM acquisition and editing tools. Vegas has been upgrading yearly, normally previewing at National Association of Broadcasters (NAB) convention, and announcing their upgrade version shortly after-

wards. More recent improvements in Vegas6 continue with digital camera acquisition tools and do not substantially change the basic audio or video engine, thus while this book is a solid guide to Vegas5, it will also function well for Vegas6.

The audio engine has always been at the core of what Vegas is all about as a non-linear editor. Vegas Video grew out of the audio engine that was Vegas Audio which has always been a solid hard-disk recording and editing program. Now Vegas5 features surround-sound plug-ins for audio encoding and has panning buses for 5.1 channel mixing. The book does not dwell on these features of Vegas5, which are numerous; rather, in assuming the reader is familiar with the rich feature set and menus, it presents an insider's point of view on how to use several of those features and move to expert level for more advanced project work. For example, author Douglas Spotted Owl writes about how to use an external MIDI device to control the software in Vegas. This, combined with software automation, a nice set of DSP and FX plug-ins, integration of your favorite audio editor, and surround-sound panning buses, gives you enough audio tools that you never have to leave the track sheet environment to start working with video.

The layout, editing, and look of the video tracks in Vegas come from the early audio multitrack recorder environment which is what I like, as opposed to working with a timeline and separate windows. Thus, the ability to organize and scroll through audio and video tracks in one window works well for me. One of the book's best chapters on video is appropriately about compositing, which is also one of the strongest features of the video engine. Additional chapters highlight filmic aspects of Vegas5.

Another aspect of Vegas I like is

the availability of interesting video plug-ins and there is a short chapter in the book showing interesting video effects achieved from using some of these plug-ins. The program comes with several Sony plug-ins for audio and video processing as well, and the ability to encode into a variety of file formats including a new Sony YUV 4:2:2 codec for delivery of Standard Definition files which can later be encoded/decoded into a variety of file formats.

The DVD-ROM included with the book contains source video files, stock stills, ACID loops, sample Vegas project files, two bonus chapters left out of the book, demo and free software, a collection of legal forms such as Copyright forms, Location releases for the independent filmmaker, and several free and trial-use plug-ins.

Vegas is plenty powerful for rendering to MPEG file format and using the companion DVD-Architect2 for multiplexing and burning to DVD-Video. For High Definition (HD) video, if one is lucky enough to have access to Sony peripherals such as an HDCam, JH3 Tape Playback Deck, Xpri, and an HDCam Recorder Deck, then Vegas can help you develop 24p EDLs (Edit Decision Lists) as uncompressed AVI files using the Xpri. These can then be sent to a post house for mastering or used to make 24p DVDs in NTSC or PAL. An alternative to Xpri now exists in version 6 of Vegas with the DeckLink software and PCI card support for both Apple Mac OS X and Microsoft Windows XP for capturing, editing, monitoring, and printing-to-tape using the SDI (serial digital interface) format in 10-bit uncompressed video. For larger HD projects, the book includes a "how-to" guide on network rendering (render farming), a helpful start for setting up distributed rendering.

Vegas is extremely powerful as a

computer-based nonlinear editor for the home user, and is also in use at the upper end of project studio work and in the corporate environment for media production as well. There are also educational discounts for site licenses available for using the program in the school computer lab. With recent software upgrades for ease of digital camera acquisition, Vegas clearly seems headed in the direction of integrating this software for use with Sony hardware and utilizing those features for nonlinear editing of digital film.

I found the book easy to read, and the examples are clearly produced by an experienced user. The book is best used after gaining a little bit of experience with Vegas and becoming ready to move to a higher level of user proficiency rather than as a starting point for working with the software. A lot of software instructional guides become muddled in the amount of time spent on the introduction of technical aspects, navigating you through the menus and features, revealing tips and tricks, or dwelling on areas of specialization. *Vegas5 Editing Workshop* has hit just the right note, includes a good mix of topics, and will most definitely help improve your user techniques and workflow.

Marina Bosi and Richard E. Goldberg: Introduction to Digital Audio Coding and Standards

Hardcover, 2003, ISBN 1-4020-7357-7, 434 pages, introduction by Leonardo Chiariglione, US\$144.00; Kluwer Academic Publishers (now known as Springer Science+Business Media Inc.), 101 Philip Drive, Assinippi Park, Norwell, Massachusetts, USA; telephone (+1) 781-681-0537; fax (+1) 781-681-9045; Web www.springerlink.com/.

*Reviewed by Bob L. Sturm
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Stanford University's well-known Center for Computer Research in Music and Acoustics (CCRMA) has offered a class since 1997 that introduces digital audio coding by a leading researcher in the field, Dr. Marina Bosi. By the end students not only understand the concepts behind audio coding, but are able to create a functional encoder and decoder—known together as a codec—for audio signals. As the authors state in the preface, "The ultimate goal of the class, and now of this book, is to present the student and reader with a solid enough understanding of the major issues in the theory and implementation of perceptual audio coders that they are able to build their own simple audio codec" (p. xvii). The text traverses the wide range of subjects necessary for accomplishing this task, from as basic as how analog signals can be represented with discrete bits to as complex as how an hour of CD-quality audio can be represented with 60 megabytes (MB) instead of 600. The numerous readings and notes given in the six years the class has been offered before the publication of this book, which has included technical articles, book chapters, and standards documentation, has been summarized and compiled in a natural way by Ms. Bosi and Mr. Goldberg. The end result is a book that can serve both as a class text and as a reference.

Actually, understanding digital audio coding is essential for an understanding of *all* the technology that surrounds the computer musician, from the tools used to create music to the methods used to distribute it. For instance, the technology behind the CD, DVD, and MP3 are all made possible by audio coding techniques. This text will aid the reader in under-

standing the state-of-the-art in digital audio coding without having to read through numerous complex standards documents.

The book is arranged in two major sections, and has 15 chapters in total. The first and largest part (chapters 1–10) presents audio coding methods from the basics, like digital representations and the frequency domain, to more complex topics like the modified discrete cosine transform and perceptually informed bit allocation. The second part (chapters 11–15) goes into detail about numerous audio coding standards, from MPEG-1 to the still developing MPEG-4, offering a great history and overview of current developments in audio coding.

The first chapter introduces the field of audio coding and provides motivation for learning representation schemes more complex than pulse code modulation, namely to better utilize bandwidth. Chapter 2 is devoted entirely to quantization, or the limited precision of digital representations. One of the topics in this chapter, Huffman coding, is essential to completely understanding the ideas behind MPEG-1 Layer III, or MP3. A brief excursion into mathematics is taken in chapter 3, where useful concepts like the Fourier transform and the frequency domain are presented. The most important theorem of digital audio, the sampling theorem, is also presented.

Chapters 4 and 5 are the real meat of the book, introducing pseudo-quadrature mirror filtering (PQMF), the discrete Fourier transform (DFT), and the modified discrete Cosine transform (MDCT). These chapters require devoted concentration and cross-referencing to fully understand the material. These topics are essential, because they form the central components in modern audio coding algorithms. For instance, the PQMF allows one to split an audio signal

into many frequency-isolated signals for more efficient processing, and to reassemble the sub-bands without distortion and without increasing the data rate. This technique is used in MPEG-1 Layer I and II coders. The DFT and MDCT are presented in chapter 5; they are used in MPEG-2 AAC, for example. Instead of convolving blocks of a signal by PQMF impulse responses, transform-based coders window the signal and use the DFT to work directly in the frequency domain. Overlapping windows would increase the data rate were it not for its time-domain aliasing cancellation property. Together, the PQMF and MDCT are used in cascade in the MPEG-1 Layer III codec.

The final four chapters of the first part of the book introduce psychoacoustics and perceptual audio coding, and illustrate the benefits of taking advantage of human auditory limits. Chapter 6 provides an introduction to the science of psychoacoustics, from the hearing threshold and Fletcher-Munson curves to the phenomena of time and frequency masking. The final part of this chapter presents the anatomy of the ear and how it works. Chapter 7 introduces models of hearing for use in audio coding. These are motivated by the idea that if certain parts of the spectrum of a signal are inaudible due to masking, fewer bits can be allocated to those parts because the resulting distortions will not be heard. Methods for distributing the bits are the subject of the next chapter. Here one finally sees how 10 MB of audio can be represented in 1 MB or less with little to no loss in quality.

The goal of the book, assembling a codec that takes advantage of human perceptual limits, is the subject of the penultimate chapter of the first section. Here the authors discuss how the various pieces that have been studied fit together. From the compu-

tation of masking curves, to the content of the file headers, and even to some comments on the business of the deployment of codecs, this chapter is the last thing one needs to build an audio codec, provided one already has programming experience. After this then, all that is left is to measure the quality of your implementation on a variety of sources, and fine-tune your system. How to do so within professional guidelines, and the various artifacts created by the coding of audio, is the subject of the final chapter of the first half.

Part 2 of the book goes into detail about five audio coding standards: MPEG-1, MPEG-2, MPEG-2 AAC, Dolby AC-3, and MPEG-4. These standards, as applied to audio, are all meant to provide methods to code audio in perceptually lossless ways by incorporating psychoacoustic models. Chapter 11 presents a history of several MPEG standards and the goals each is meant to accomplish. The MPEG-1 audio standard, a specification for reducing the data rate for high quality audio synchronized to video, is then presented in detail. This standard led to the development of MPEG-1 Layer III format, or the MP3 format that many know and love. The functional blocks of each layer are discussed and their differences pointed out. The psychoacoustic models and bit allocation schemes used in MPEG-1 are presented as well.

MPEG-2 audio is the subject of chapter 12. This standard is meant to improve upon MPEG-1 audio for lower data rates and multichannel audio applications. Achieving this requires lower sampling rates, which represents a reduction in signal bandwidth. This, however, is an acceptable compromise for some applications, like browsing music online. Multichannel audio is introduced next, and how it is encoded into a

two-channel standard is presented. An extension to MPEG-2, known as Advanced Audio Coding (AAC) is presented in chapter 13. This standard addresses the limitations imposed on MPEG-2 by the requirement that it be backwards compatible with MPEG-1. Without this restriction, MPEG-2 AAC allows sampling rates of up to 96 kHz, 48 channels of sound with various loudspeaker configurations, and superior sounding audio quality at higher bit rates.

The next chapter presents a standard outside the realm of MPEG, Dolby Digital (AC-3). This format is used for DVD and High Definition television. Like MPEG-2, AC-3 is meant to support multichannel audio accompanying video. It supports up to five channels in various configurations. Unique to this format is its flexibility in letting users specify different settings such as dynamics control, different speaker configurations, and multilingual support.

The final chapter deals with the MPEG-4 audio standard. Unlike the previous MPEG standards, MPEG-4 is a broad collection of specifications and tools for "media objects" such as still images, video, and audio, and includes functions that can alter them, such as special effects. In this way it is not a single algorithm for the coding of audiovisual data. It is meant to address a wide range of scalable applications, such as digital broadcasting, mobile communication, and interactive multimedia, at numerous data rates. The tools it contains include tools for speech coding and synthesis, high-quality audio coding, sound synthesis, and even tools for intellectual property management.

The authors do an excellent job relating the numerous topics covered in the book to the main goal of creating an audio codec. In many places they mention which coding standards use the information just presented.

The reader understands at once the importance and applicability of the material. Because this book is intended in part to enable a reader to design and build a codec, whether it is compliant or not with existing standards, the authors are thoughtful enough to include at the end of each chapter key references, as well as practical exercises for a deeper understanding of the material. These exercises, most of which require programming of some kind, are great. I was able to do most of them using MATLAB, but with many free and open-source audio libraries available, they could just as easily be done in another language.

Two unfortunate problems with this text are the figures and the equations. All the figures are in black and white, which becomes a problem when a graph has several lines that cannot be discerned one from another. Usually the figures can be properly interpreted, but having to spend time decoding it because of formatting is annoying. The formatting of all of the equations in the text is also troublesome. First there are no equation numbers, so referencing an equation from within the text is usually limited to paragraphs near its appearance. Second, some of the equations are formatted like they were copied and pasted from an ASCII text file, rendering them difficult to read. Lastly, the notation is inconsistent. In many equations, but not all, the use of "*" denotes multiplication. Returning to the text for reference at a later time I had considerable confusion as to why two windows were being convolved instead of multiplied. With no symbol table included with the text, I had to find the first instance of their symbol for convolution ("o").

Introduction to Digital Audio Coding and Standards is quite straightforward and is a welcome summary of the numerous and sometimes-

obfuscating standards documents. It presents all topics relevant to audio coding in a logically arranged order, which is something that instructors and students who use this text will appreciate.

Recordings

Leslie Stuck: Pas

Compact disc, c74-008, 2003; available from Cycling '74, 379A Clementina Street, San Francisco, California 94103, USA; telephone (+1) 415-974-1818; fax (+1) 415-974-1812; electronic mail info@cyclining74.com; Web www.cycling74.com/c74/.

*Reviewed by Peter V. Swendsen
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Few computer music composers are as intensely and exclusively committed to scoring for dance as Leslie Stuck. Although this deprives concert audiences of his provocative music, it serves to highlight his infatuation with movement and his skill for creating its sonic surroundings. Mr. Stuck's recent compact disc, *Pas*, grants everyone a glimpse into the vibrant soundworld that dance audiences have been enjoying for many years. Spanning ten years of work realized in collaboration with choreographers in Europe, Japan, and on both U.S. coasts, the compositions on *Pas* allude to their fundamental relationship with dance while also standing firmly on purely musical ground. There is movement to be found and felt in this music whether you are performing to it onstage or listening to it while sitting at home.

It is worth mentioning at the outset that any critical treatment of this

Leslie Stuck

Pas



music is incomplete without a simultaneous consideration of the choreography with which it resides on stage (though such attention is largely beyond the scope of this review). This is particularly the case with Mr. Stuck's music not because his compositions do not deserve independent analysis and response, but rather because Mr. Stuck places tremendous importance on creating a meaningful, intimate, and non-hierarchical relationship between sound and movement. Having experienced some of the pieces presented on *Pas* in concert, I can assure you that he succeeds in this enterprise.

Though each of the six pieces on *Pas* has its own distinct character and energy, there are certain qualities they all share: crispness, rhythmic vigor, allusions to or direct use of acoustic instruments, and just enough whimsical sound objects to keep you guessing while submerged in an inventive soundworld. The opening piece, *special x*, exemplifies Mr. Stuck's predilection for acoustic instruments, which he samples, processes, and assembles to great effect. Though at times the timbres of *special x* sound slightly dated to 2005 ears, the soundworld in general is incredibly precise as Mr. Stuck plays with the boundaries of source recognition, letting each sonic element have its say, until an undeniable rhythmic insistency emerges.

Soothing the Enemy uses a berimbau as its primary—or at least most recognizable—sound source. This is a more compelling starting point than the collection of instruments in *special x*. Perhaps Mr. Stuck agrees, as the berimbau samples often appear without extensive processing. There is also ample space in the gestures here, one of many indications on *Pas* of Mr. Stuck's sensitivity to the need for moments of silence, even if they are brief. This sonic prudence benefits the music and especially succeeds in the dance theater, when an unsympathetic constancy of sound and movement can easily overwhelm an audience. *Soothing the Enemy* is tight and focused, its rhythmic groove supporting a satisfying use of spatial movement and registral ranges. Though it is included here as an excerpt of the longer original work, it feels whole and well structured.

The more limited pitch world of *maxi-zub* makes its rhythmic character all the more driving. A single high piano note instigates much of the additive action here, as other piano sounds and sampled material snap to an unyielding metric grid. Here again, one can witness Mr. Stuck's ability to assist, but not overwhelm, the dance for which he composes. Though the rhythmic foundation of *mazi-zub* seems poised to support extended melodic and harmonic lines, Mr. Stuck keeps these to a minimum, granting the choreographer and audience their own gestural space in which to function.

Pas is at its most organic in *Convolution*, a composition with wider-ranging gestures and formal departures than its counterparts. Its modulations in size, space, and mood carry *Convolution* on a living and breathing path through sparseness, self-invention, and frenetic density. Though it stumbles into a slightly meandering section in the middle

(quite possibly a choreography-necessitated restraint in Mr. Stuck's otherwise active score), its formal shape is both welcoming and imaginative. As is the case in other pieces on *Pas*, *Convolution* breaks down to a minimal collection of sounds and gestures about two-thirds of the way through the piece. However, in this case, the rebuilding that occurs as the piece approaches its end never quite attains the ferment heard earlier, a tactful touch that leaves one wanting more after an engaging nine minutes.

The aptly titled *Go* sneaks into the fray as the penultimate piece on *Pas*. This frantic miniature is electric and bubbling. It both flies by and allows you to get lost in its midst, like the two minutes when you decide you are fed up with your list of demands for the day and pull quickly onto that inviting back road that will whisk you out to the country, where you can drive fast and open the windows.

Mondriaan was the first piece of Mr. Stuck's that I experienced in concert, paired with the intense and finely crafted choreography of Mary Cochran. Though complete conjecture on my part, the title perhaps refers to Mr. Stuck's algorithmic compositional processes, which are employed throughout *Pas*, and which echo the painter Piet Mondriaan's weighted grids in their rhythmic character and subtle shifts of focus. In any case, this final piece is wonderfully cinematic. Its sounds have character, it plays with perceptions of foreground and background, and its rhythmic and gestural "cuts" keep the pacing fresh and engaging. Sampled sound objects pop out from a lingering and lush texture of strings, every so often initiating a tangential departure that sometimes succeeds in leading the piece to new territory and sometimes is thwarted by a reassertion of existing material. At times it feels like a struggle between nature

and industry, at others like you are standing on a knife-edged peak where on one side of you is the most amazing view you have ever had and on the other is a fall to certain death.

Given his dedication to the venue, the collaborators with which he works, and most importantly, the energy and quality of his work, it is clear that anyone even remotely interested in composing for dance (or dancing to new music) should immediately familiarize themselves with Mr. Stuck's music. But other listeners, composers, and computer musicians in general would do well to explore the works on *Pas*. Their rhythmic invention alone makes them well worth a listen, with superior sonic features, high-level production, and finely crafted structures thrown in as a bonus. Experience Mr. Stuck's music live if you can, as it is a real treat to see choreography and music interact so convincingly, but in any case, do take advantage of finally having this appealing collection in portable CD form.

Multimedia

Toni Dove: Sally or the Bubble Burst

DVD-ROM, 2003, Bustlelamp Productions, US\$ 49; available from Cycling '74, 379A Clementina Street, San Francisco, California 94103, USA; telephone (+1) 415-974-1818; fax (+1) 415-974-1812; electronic mail info@cyclimg74.com; Web www.cyclimg74.com/.

*Reviewed by S. Lyn Goeringer
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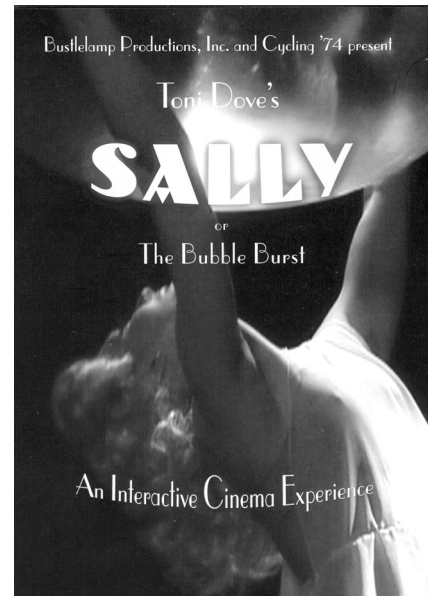
Sally or The Bubble Burst is an interactive DVD-ROM written, directed,

and designed by Toni Dove. It is an excerpt from a larger work-in-progress titled *Spectropia*. The DVD takes you through different scenarios in which you can interact and observe various characters, including Sally, who was designed by Toni Dove and based on a real life burlesque/nude dancer from the early-to-mid part of the last century, Sally Rand. Through the use of Max/MSP and Jitter, the disc is designed so that you can interact within certain segments through a speech recognition program, a computer keyboard, or through movement of a computer mouse. It can only be operated on Macintosh platforms (Macintosh OS 9.1–9.2.2 or Max OS X 10.2 or later; a microphone is required to use the speech recognition capabilities of the work).

The main menu of the DVD has four options, which I will describe briefly. The first option is to play the program, the second is to play "Sally Sings," and then there are two previews of coming attractions from Ms. Dove: *Artificial Changelings* and *Spectropia* (which is the project *Sally or The Bubble Burst* is a part of).

When you play the program, a new menu screen comes up. You may choose here to speak directly to Sally using the speech recognition program, or you may interact with her using your keyboard. After making a selection, you may select one of three zones within which to interact with Sally and the other characters in the world she inhabits.

In Zone 1, you are able to have a conversation with Sally. The conversations are based on either speech recognition or typed-word recognition. If you are typing in your questions and responses to Sally, the conversation seems to be brief and to offer less varied responses. If you have a spoken conversation with Sally, the conversation lasts longer and the responses seem to have more



variation. The content of the conversation comes from quotes either about the actual life of Sally Rand, or at times even quotes from the actual Sally Rand. The comment she offers when discussing whether you find her performance shocking that "some people probably would want to put pants on a horse," was originally made by Superior Judge Joseph B. David (19 July 1933) when discussing charges brought forward relating to her performance at the Chicago World's Fair in 1933.

There are several strange things that occur while carrying on the conversation with Sally in Zone 1. Most noticeably, the computer gets responses easily confused. The operation manual suggests using a noise-canceling microphone to help with this problem, but it is still interesting to note the strangeness of some confusions. When you speak a word clearly, the computer repeats the word back to you as Sally is responding. This repetition can alleviate some confusion in her responses. As she speaks, each word is presented as a separate facial

expression, creating a video-collaged sentence. After running this aspect of the program multiple times and noticing there were several stored sentences, it became unclear to me why the collage element was necessary. Her responses could be more fluid visually, though more memory may need to be used to create a system in which to do this.

Another feature of Zone 1 is the ability to manually select keys to change Sally's expression. You are also supposed to be able to type words for her to speak as well, although I could not get this aspect of the program to function. The expressions were possible to obtain by selecting letters on the keyboard.

Zone 2 allows you to hear from the objects surrounding Sally on the set. There is a radio, a small clear white bubble, a larger bubble on a black floor, a chair, and a shawl. By clicking on these objects you can hear what they have to say, and each object has multiple responses, so you can click on them several times to hear several comments and commentaries from them. Each object offers its own social commentary on the Great

Depression and on consumerism. This is the least interactive aspect of the disc.

I found Zone 3 to be the most completely realized part of the project. Utilizing mouse tracking and/or voice recognition, you are able to direct the movement of the character Sally dancing with a bubble as well as use your voice to have her sing along. It is possible to change the sample response rate. The video is quite smooth, and very predictable, allowing you to move the mouse as though you were dancing with her. The music that accompanies the videos is also linked to the mouse, and it speeds up or slows down with the movement of the mouse.

On the main menu there is another option, which is to play "Sally Sings." You have the option to get her to sing three pre-programmed songs: *Daisy Bell*, *You Made Me Love You*, and *Out Of No Where*. You also have the option to have her sing notes you play by clicking on a keyboard on the screen or through your computer keyboard. This portion contains the same collage style found in Zone 1 of the primary program on the disc.

On the whole, the product would be useful to instructors wanting to give a brief introduction to some of the capabilities of a combined Max/MSP and Jitter environment. When combined with the information on the Coming Attraction trailers for *Artificial Changelings* and *Spectropia*, it would allow an instructor to show some of the possibilities within an interactive video installation and performance environment. Unfortunately, the DVD does not deliver as much of interest to the individual user, as it seems to be a demonstrative video rather than an interactive environment that would draw you back again and again. The responses and interaction between the participant and the characters as presented in *Sally* can be almost exhausted after an hour of pursuing the possibilities. As an installation, this can be very effective, but as an in-home product, it is not very satisfying. The project does not reduce well to a DVD-ROM, and is best suited for a large installation space, where we would be expected to interact with the characters for only a brief moment of time.