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## About This Issue

The articles in this issue commence with a case study of compositional algorithms applied in live performance. The laptop performing duo klipp av ("cut apart" in Swedish) consists of Nick Collins (audio) and Fredrik Olofsson (video and computer graphics). As their name suggests, one of the duo's primary performance strategies consists of the real-time segmentation and splicing of audio and video signals. Algorithms control the composition and repetition of the splices, which are applied to stored material or to audiovisual events captured live. The interaction and mapping between audio and video constitutes a central concern of the duo. In their article in this issue, the two performers provide some contextual background to their work and then explain their segmentation and mapping techniques in detail. (Not coincidentally, some of these topics hark back to our issue on visual music, Winter 2005, for which this article was originally submitted.)

Two of this issue's articles deal with subtractive sound synthesis, an historically important but still vital area of electronic music. The first of these articles concerns virtual analog synthesis, namely, digital emulation of analog synthesizers (an idea featured in our Winter 1997 issue, and

one that has become commonplace in today's commercial music software and hardware). The authors—Vesa Välimäki and Antti Huovilainen at the Helsinki University of Technology—offer new, efficient methods for digitally generating the sawtooth, pulse, and triangle waveforms of classic analog synthesizers, but with attenuated aliasing. They also propose an efficient digital version of the famous Moog ladder filter, one that has fairly independent cutoff and resonance and offers several types of response.

The other article on subtractive synthesis, by Mitsuko Aramaki et al., describes a model for synthesizing percussion instruments and related impact sounds. In the authors' real-time implementation of their theoretical model, the stochastic source is Gaussian white noise, band-pass filtered through 40 resonant filters and combined with the output of 40 periodic oscillators. The mixture of the white noise, filtered noise, and oscillator output is fed first through a set of filters modeling the excitation, next through a set of time-varying filters modeling the material (wood, steel, glass, etc.), and finally through a filter that accounts for the impact force. The authors focus on usability, offering several strategies for map-

ping the large set of synthesis parameters to a reduced set of control parameters.

The final two articles have in common the broad topic of the characterization of musical signals. In the first of these articles, Matt Cooper et al. present a survey of techniques for extracting features from sound recordings and presenting the results visually so as to facilitate music information retrieval. As background, the authors describe ways to reduce the number of parameter dimensions resulting from audio analysis. They then describe some approaches to visualizing attributes of a single piece of music: the similarity matrix, beat spectrum, beat spectrogram, beat histogram, "GenreGram" (a real-time display of instantaneous classification results) and "timbregram" (a sequence of color-coded vertical stripes, with time on the horizontal axis). Finally, the article considers two methods for visualizing collections of music: timbre spaces and "Islands of Music" (a technique, based on self-organizing maps and smoothed data histograms, that was explained in our Summer 2004 issue).

Shlomo Dubnov's article takes a new look at randomness and structure in musical signals. He adopts ideas not only from traditional signal

*Front cover.* Vesa Välimäki and Antti Huovilainen's digital nonlinear model of the Moog ladder filter (top), and a computed anticipation profile superimposed on a spectrogram of a

Schumann composition, from Shlomo Dubnov's article (bottom). For more information, see the respective articles.

*Back cover.* Correlation of rapidly changing video and audio events, from the article by Nick Collins and Fredrik Olofsson.

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processing, but also from information theory, to arrive at a perspective on anticipation in music. The author stresses that one needs to take into account not just the signal, but also the listener, in order to model the predictability of the signal (which is not the same thing as its determinism). Information rate (IR) refers to the reduction in uncertainty about the present signal that is afforded by considering its past. The author's "vector-IR" technique generalizes

notions of anticipation to apply to vectors in a multidimensional space, à la principal components analysis (PCA) or independent components analysis (ICA). The musical applicability of the technique is considered by comparing his automatically derived "anticipation profile" to time-varying human judgments of emotional force in recorded music.

The event reviews in this issue cover the artistic presentations at Ars Electronica 2005 and the 2005 Inter-

national Computer Music Conference, as well as the paper sessions at the 2005 International Conference on Music Information Retrieval. Also reviewed here are William Sethares's book on the relationships between scales and timbres; discs by composers Roger Reynolds, Agostino Di Scipio, John Levack Drever, and Curtis Roads (with video by Brian O'Reilly); and a suite of software plug-ins for audio processing.

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# Announcements

## Sonic Arts Network Expo

The Sonic Arts Network will hold their 2006 Expo on 23–26 June 2006 in Manchester, UK. Performances, exhibitions and presentations by UK artists and a selection of international artists will be spread among venues across Manchester including concert halls, galleries, bars, nightclubs, and historic architectural spaces. Among the work will be a £4,000 commissioned installation at Cornerhouse. All events will be free and open to the public.

Web: [www.sonicartsnetwork.org](http://www.sonicartsnetwork.org).

## Musicacoustica and Electronic Music Studies in Beijing

The Musicacoustica 2006 festival will be held in Beijing, China, on 22–29 October. The theme of the conference is Language. The festival will be held in conjunction with the Electroacoustic Music Studies 2006 (EMS06) conference around the theme of Terminology and Translation. The joint meeting is envisaged as a summit on the conherence of electroacoustic music terminology subject to the twisting and bending of the field in its emerging global context. Issues to be covered include linguistics and music, ontology specification, semantic Web, music knowledge modeling, and the translation of specialized electroacoustic concepts and terminology.

The conference and festival are hosted by the Electroacoustic Music Association of China (EMAC) and the China Electronic Music Center (CEMC) based at the Central Conser-

vatory of Music in Beijing, along with the Electroacoustic Music Studies Network. In addition to conference events, festival concerts will take place throughout the week.

Web: [cemc.ccom.edu.cn](http://cemc.ccom.edu.cn) and [www.ems.dmu.ac.uk/ems06](http://www.ems.dmu.ac.uk/ems06).

## The World by Ear

This year's International Conference on Auditory Display (ICAD2006) will host a concert of sonification entitled "Global Music—The World by Ear" on 21 June 2006 at the Institute of Contemporary Arts (ICA) in London. The music selected for performance at the concert will be derived in various ways from "global data" derived from specific aspects (e.g., geographical, ecological, or economic) of the environment in which societies exist.

Web: [www.dcs.qmul.ac.uk/research/imc/icad2006/concert.php](http://www.dcs.qmul.ac.uk/research/imc/icad2006/concert.php).

## New Doctoral Program at Bowling Green

The College of Musical Arts of Bowling Green State University in Ohio, USA, has announced a new DMA program in Contemporary Music. Graduates of the new program will be trained as composers or performers conversant in the aesthetic, technical, and philosophical aspects of contemporary music. The program will utilize the Music Technology and Recording Studios as a research facility, and will support interdisciplinary interaction with the School of Art as well as the Center for New Media

and Emerging Technology. Candidates for the degree will also carry a minor concentration in culture, music cognition, or digital media.

Web: [www.bgsu.edu/offices/pr/news/2005/news15939.html](http://www.bgsu.edu/offices/pr/news/2005/news15939.html).

## Ars Electronica 2006

Ars Electronica will be holding their annual Festival for Art, Technology, and Society with exhibitions, lectures, public discussions, installations, concerts, and performances on 31 August–5 September 2006.

Documentation from the Ars Electronica 2005 festival, "Hybrid—Living in Paradox," is online, and contains speeches, forum recordings, essays, and descriptions of projects.

Web: [www.aec.at](http://www.aec.at).

## Music Perception and Cognition Conferences

The Ninth International Conference on Music Perception and Cognition (ICMPC9) will be held on 22–26 August in Bologna, Italy. The conference will also be the occasion for the Sixth Triennial Conference of the European Society for the Cognitive Sciences of Music (ESCOM6). The goals of the conferences are interdisciplinary discussion and dissemination of research in the psychology of music, theory, composition, psychophysics, performance, education, neurophysiology, linguistics, artificial intelligence, and computer technology.

Web: [www.icmpc2006.org](http://www.icmpc2006.org).

# News

## Phonurgia Nova Awards 2005

Phonurgia Nova has announced the winners of their annual radiophonic arts competition for 2005. The competition targets independent radio producers, musicians, composers, sound artists, and production teams, with prizes of monetary awards and residencies.

The winners of the monetary award for Radio Arts were Marcus Gammel and Viktoria Tkaczyk for *Europas Wahn (Insane Europe)*. The award in the Media Arts category went to the collective LIGNA for *Radio Ballet*. Pierre Couprie was awarded the GRM residency in Paris for a project using the archives of Radio Libertaire. Béatrice Brociner and Christophe Modica were awarded a residency with the Groupe de Musique Vivante de Lyon (GMVL) for their proposed project *flux-reflux* based on a poem by Mallarmé. A residency with the Institut International de Musique Electroacoustique de Bourges (IMEB) was granted to Claire Moutarde for her project *Comment en suis-je arrivée là?*

Web: [www.phonurgia.org/concours\\_regle.htm](http://www.phonurgia.org/concours_regle.htm).

## Stockhausen in London

Karlheinz Stockhausen made a rare appearance at a concert of his music at Billingsgate Market in London, UK, on 25 October 2005. The composer worked the levels at the control desk for two tape pieces: *Kontakte* (1960) and *Oktophonie* (1991) (an excerpt from his week-long opera *Licht*).

Web: [www.stockhausen.org/stockhausen\\_texts.html](http://www.stockhausen.org/stockhausen_texts.html).

## Oscillations 2005

The Oscillations Music Society hosted a weekend festival including five concerts of electroacoustic music on 18–20 November 2005 in Wolfville, Nova Scotia, Canada. The guest artist was Robert Normandeau, who presented his compositions and led workshops. The festival also celebrated Atlantic-region composers and performers.

Electronic mail: [atlantic@musiccentre.ca](mailto:atlantic@musiccentre.ca).

## CIMESP 2005 Winners

The winners of the 2005 Concurso Internacional de Música Eletroacústica de São Paulo competition have been announced. There were 185 compositions by 130 composers from 32 different countries submitted for the biennial event. The jury consisted of Flo Menezes, Hans Ulrich Humpert, Gilles Gobeil, and Jorge Antunes. The first place winner was David Berezan for the acousmatic piece *Styal*. Second place was awarded to Kyong Mee Choi for *Sublimation*, a piece for marimba and electroacoustic sounds. The second prize “ex aequo” was awarded to João Pedro Oliveira for *Time Spell* for clarinet and electroacoustic sounds, and a “public prize” was granted to Diana Simpson for the acousmatic *Broken Nerve*. There were also three honorable mentions: Roger Cochini for *La Schiuma dei Rumori*, Fancis Dhomont for *Vol d'arondes*, and José Manrique for *Historias*.

Web: [flomenezes.sites.uol.com.br/master.html](http://flomenezes.sites.uol.com.br/master.html).

## Sound Installations for Commonwealth Games

A series of sound installations, “Empirical Soundings; Soundscapes from the Commonwealth,” was part of a cultural festival held in conjunction with the 2006 Melbourne Commonwealth Games held on 15–26 March 2006 in Victoria, Australia. Sound artists from Commonwealth countries submitted soundscape installations that reflected aspects of their home countries and the sports that are included in the Commonwealth Games.

Web: [cajid.com/empirical](http://cajid.com/empirical).

## Women in New Music Festival

Voices on the Edge: Fifth Annual Women in New Music Festival was held on 9–12 March 2006 at California State University in Fullerton, California. The festival schedule included concerts, lectures, master classes, and lectures featuring Pamela Z, the Ethel string quartet, and Chen Yi, composer in residence. The annual festival features the International Women’s Electroacoustic Listening Room Project, eight hours of a diverse sampling of electroacoustic music by women composers from around the globe. The festival will also be traveling for presentation at various venues throughout the United States and Europe.

Electronic mail: [pmadsen@fullerton.edu](mailto:pmadsen@fullerton.edu).

## High-Definition MIDI

A proposal for High-Definition MIDI protocol (HD-MIDI) is under discussion by the MIDI Manufacturers As-

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sociation (MMA). The update is to include greater resolution in data values, increase the number of MIDI channels, and support the creation of new messages for the 20-year-old protocol. MMA Technical Standards board members have been meeting and introducing the proposal at audio-related conferences and trade shows since October 2005.

Web: [www.midi.org/newsviews/hdmidipr.shtml](http://www.midi.org/newsviews/hdmidipr.shtml).

### **Sonorities Festival in Belfast**

The Sonorities Festival of Contemporary Music was scheduled to be held 25 April–1 May 2006 in Belfast, Ireland. Sonorities is the longest-running new music festival in Ireland. This year's festival is dedicated to music performance practice that challenges the traditional roles of the composer, score, performer, and audience.

A new "miniconference" on performance in technology-mediated environments, called "Two Thousand + SIX", will take place during the Sonorities festival on 29 April, and will be hosted at the Sonic Arts Research Center at Queens University in Belfast. Keynote speakers include Susan Broadhurst and Ben Watson.

Web: [www.qub.ac.uk/sonorities](http://www.qub.ac.uk/sonorities).

### **Musica Nova 2005 Winners**

The Society for Electroacoustic Music of the Czech Republic has an-

nounced the winners of its Musica Nova 2005 composition competition. There were 111 pieces submitted from 32 countries. The competition was directed by Lenka Dohnalová, and the 7-member jury was presided over by Rudolf Růžička.

For Category A, compositions of autonomous art electroacoustic music, the winner was Petra Bachratá for *Nunataq*, and an honorable mention was given to Robert Sazdov for *Bogorodica 28.08*. For Category B, composition for acoustic instrument/voice/ensemble and electroacoustic media, the first prize went to João Pedro Oliveira for *A Escada Estereita*.

Special awards for Czech composition and for a composition by a young composer were won Jana Bařinková for *Rainbow Island*. An honorary mention for Czech composition went to Michal Rataj for *Hearing First*.

Recordings of the winning compositions are available on disk from the Musica Nova Web site.

Web: [www.musica.cz/musnova](http://www.musica.cz/musnova).

### **Computer Music and Voices**

The Interdisciplinary Center for Computer Music Research held the Peninsula Arts Contemporary Music Festival on 24–26 February 2006 at the University of Plymouth, UK. The weekend festival of performances, lectures, demonstrations, and workshops explored contemporary music for "voices" and showcased computer music research and new developments at the University of Plymouth.

Festival directors were Simon Ible and Eduardo Reck Miranda.

Web: [cmr.soc.plymouth.ac.uk/event.htm](http://cmr.soc.plymouth.ac.uk/event.htm).

### **Knowing the World Through Sound**

The Electronic Music Foundation in collaboration with the New York University Music Technology Program presented a program on 11 December 2005 in New York City entitled "Knowing the World Through Sound." The day-long symposium and evening concert served as the introductory event to An Ear to the Earth: A Festival of Music, Sound, and Ecology that will have events spread throughout 2006, culminating in a ten-day concentration of installations, public art, sound walks, and educational programs in October 2006.

Knowing the World Through Sound included workshops and panels conducted by ethnomusicologist and composer Steven Feld, media artist Andrea Polli, sound artist Steven Miller, and the New York Society for Acoustic Ecology. The evening concert was scheduled to have music by Miya Masaoka, Steven Feld, David Rothenberg, and David Dunn.

Web: [www.eartotheearth.org](http://www.eartotheearth.org).