Reviews

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Events

MCM 2013: The Fourth International Conference on Mathematics and Computation in Music


Reviewed by Louis Bigo
Paris, France

The fourth International Conference on Mathematics and Computation in Music [MCM 2013] took place on Mathematics, Music, and Media in Technology (CIRM-MMT). Contributions in the field of mathematics and computation, applied to musical problems, were presented along with paper and poster sessions. The 20 paper presentations were grouped into nine sessions: Analytical Algorithms, Generalized Tonal Sets, Tone Systems and Interval Content, Musical Performance: Theory and Analysis, Harmonic Spaces, Corpus Studies of Harmony, Sturmian Words, Group Actions on Ordered Sets and Style, and Creativity.

The nine posters were grouped into two sessions. Unfortunately, only the abstracts for the poster sessions appear in the conference’s proceedings. Overall, both the paper and poster sessions were characterized by an increased use of computational methods to analyze large musical corpora. This approach raises questions about the relationships between research methods in mathematics and music, and other approaches that are more common in the field of music information retrieval, such as machine learning and statistical analyses of data sets. The variety of topics in the MCM conferences since 2007 clearly shows a plethora of approaches within the math and music communities, as well as the evolution of certain topics. For example, there seems to be an increasing number of works related to word theory since 2011. The 2013 edition dedicated a whole session to Sturmian words [an infinitely long sequence of words], investigating both scale and rhythmic applications. Additionally, Gilles Baroin organized an exceptional multimedia session about inherent pedagogical problems in math and musical research.

Pedagogy was, indeed, one of the major themes of this edition. A panel discussion entitled “Mathematical Music Theory in Academia: Its Presence, Role and Objectives in Departments of Mathematics, Music, and Computer Science” took place at the end of the first day and was chaired by Mariana Montiel. A discussion round table was organized by Guerino Mazzola [University of Minnesota], David Clampitt [Ohio State University], Thomas Noll [Escola Superior de Música de Catalunya], Thomas Fiore [University of Michigan-Dearborn], Emmanuel Amiot [CPGE Perpignan], and Anja Volk [Utrecht University]. The participants agreed on the point that the intersection between mathematics and music is still, today, an uncommon idea for a majority of students specialized in either of the two fields. Nevertheless, they find it to be an exciting prospect, full of promise.

Some participants lamented the lack of books accessible to nonspecialists in the mathematical theory of music, with the notable exception of a few nonspecialist texts such as Musical: A Mathematical Offering by Dave Benson, or The Geometry of Musical Rhythm by Godfried Toussaint. At present there is no comprehensive textbook on mathematical models in music theory, analysis, and composition, from the study of temperament to discrete Fourier transforms and chordal and rhythmic classifications. The Springer Computational Music Science series, co-edited by Guerino Mazzola and Moreno Andreatta, is planning to soon fill this gap with a textbook, and we hope to learn more about it at the next MCM conference.

A concert took place at the end of the second day at the CIRM-MMT in the New Music Building. Compositions by Elliott Carter, Pierre Boulez,
Preston Beebe, Luciano Berio, and Luis Naón were played by McGill University students. The audience was particularly impressed by violinist Marjolaine Lambert, who performed Anthème II by Pierre Boulez. A new interface for percussion [the SpectraSurface] was used by Zachary Hale for the piece Unsounding Objects, composed by Preston Beebe. The performance, both inventive and impressive, was very well received.

Following the highly successful MCM 2011 conference in Paris was a delicate challenge. Organized by l’Institut de Recherche et Coordination Acoustique/Musique (IRCAM), the 2011 conference included a number of exceptional side events. Of particular note was the public discussion between two well-known French figures—mathematician (and Fields Medalist) Alain Connes and composer Pierre Boulez—about creativity in music and mathematics. Furthermore, the Paris conference was paired with an important exhibition on the topic “Mathematics and Arts” that took place at the Palais de la Découverte in Paris, with concerts at the end of each day. Although the 2013 concert at CIRMMT was strongly appreciated, it was the only one of the conference, and the organizers abandoned the idea of having keynote lecturers and hosting special events. The 2011 conference was thus unquestionably richer in density. The professionalism and cheerfulness of the 2013 organization team, however, made this event a complete success.

The conference ended with a closing reception on the last day. Most of the participants attended the closing event, which enabled a number of exchanges and projects for future international collaborations. The next edition of the conference, planned for 2015 at Queen Mary University of London, will surely confirm the richness of this interdisciplinary field and the variety of topics related to mathematical and musical research.

Recordings

Matthew Burtner: Noise Plays Burtner
Compact disc, 2013, Innova 871; Innova Recordings, ACF, 322 Minnesota Street #E-145, St. Paul, Minnesota 55101, USA; telephone: (+1-651) 251-2823; electronic mail innova@composersforum.org; http://www.innova.mu/.

Reviewed by Ross Feller Gambier, Ohio, USA
Alaskan-born composer Matthew Burtner specializes in chamber music and interactive new media. He is the inventor of the Metasaxophone, the Mobile Interactive Computer Ensemble (MICE), and the Network-Operational Mobile Applied Digital System (NOMADS). For over a decade he has worked with the San Diego–based ensemble Noise and with Innova Recordings. The present compact disc harnesses these two forces, joined together in three electroacoustic and electroacoustic-inspired works in which noise features prominently. The Noise ensemble is an instrumentally mixed sextet with flute, violin, cello, guitar, piano, and percussion. Here they are joined with the composer on the saxophone and with an additional member on the computer.

Burtner worked in Paris at l’Institut de Recherche et Coordination Acoustique/Musique (IRCAM) and with Iannis Xenakis’s Unité Polyagogique Informatique CEMAMu [UPIC] system at the Centre d’Etudes de Mathématique et Automatique Musicales (CEMAMu). His work at these two institutions profoundly impacted his approach to computer music composition. He was able to use technological tools that were unavailable at most other institutions. This was especially true with the UPIC system, which provided him with a real-time composition environment to transform graphics into sounds. It also affected the way he composed his scores for acoustic instruments, providing them with an iconic sense of time.

According to the liner notes for this compact disc, “Burtner’s interest in the whole world of sound originated from his childhood experience growing up in Alaska where the snow, wind, and sea create a ceaseless soundscape.” These elements served as the background for an ecoacoustic work entitled Snowprints (2001), the second piece on this disc. Burtner creates a sense of place by mixing recordings of snow and acoustic instruments. The recordings of snow, taken during different conditions and at different times of day, were utilized in the creation of a fluctuating noise bed that acoustically supports and surrounds the instruments. Each instrument has a computer-generated counterpart, produced with physical

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Melody Triangles (2008), is an explosive, maps out a specific timbral can be heard as a ampul demonstrates this principle. The spectral treatment is occasionally disrupted with dissonant breaks in the texture, and embellished with breath tones and microtones performed by the ensemble. Both the electronic and the acoustic sounds are shaped by synthesis and filtering techniques. One gets the sense that the constant hiss/noise drone serves as a frame from which the music emerges. It also colors the music in the sense that it conjures the experience of listening to recorded music with a low dynamic range (LPs, cassettes, etc.). The intentional use of noise in this case presents the listener with an intriguing contradiction, especially if the listener is a composer or sound engineer and routinely filters out such noises. Ultimately, I would say that Burtner conjures a sense of nostalgia without hinting at loss or melancholy, two concepts that are normally associated with it. At one point in the piece Burtner uses a simple repetitive pattern that increases in speed until it begins to sound as if it were produced with granular synthesis techniques. Toward the middle of the piece the composer introduces slow hocketing rhythms between the flute and cello, playing pitches that are rendered tonally unstable because of glissandi and microtonal inflections. This piece is a tour de force featuring all of the composer’s techniques found elsewhere on the disc, but here they become solidified into a unified whole.

The first piece, Polyrhythmicana (2002), lays out Burtner’s compositional terrain, especially with respect to his approach to rhythm, in a five-movement, 15-min composition. For this piece, the composer designed a computer instrument called the Polyrhythmicron, based on the Rhythmicon, an instrument made by Henry Cowell and Leon Theremin in the 1920s. The instrumentalists in this piece perform with click tracks that follow various polytemporal trajectories. The listener encounters noise in two respects. First, Burtner produces metaphorical noise as he introduces small perturbations between the constantly changing tempi. And second, the instruments are wrapped in tinfoil in order to create sympathetic resonance. This kind of sonic noise is a common element in African drumming and the mbira.

Metal XY, the first movement of Polyrhythmicana, can be heard as a shock to the system, or a wake-up call to listen. One encounters loud bursts of noise along with an instrumental ostinati, each evolving at a different rate of speed. In the second movement, Split/Joined Diamonds (in Wood), woodblocks and other percussion instruments are set against sustaining instruments such as the flute. The separate tempi are clearly in evidence, thanks to the composer’s consistent use of attacks and pulses. C Acceleration Phase sounds like several clocks ticking that slowly become out of sync with each other. Burtner composes out these pulse streams using flute, cello, and percussion blended with harmonics and their computer-generated counterparts. The fourth movement, Slow 2:3 (in Noise), presents dramatic percussive strikes followed by single-pitch sustains and glissandi. The result sounds strangely like the music for Japanese Noh dramas. Overlaid onto this, one hears a sustained, fan-like whooshing noise, or like hiss from a very slow tape deck without noise reduction. Melody Triangles, the final movement, initially utilizes unison rhythms and pitch lines. Gradually each part separates as the texture thickens, giving the music a pronounced sense of urgency. The final slow tremolo gesture provides closure, yet given the previous 14 minutes, seems like an arbitrary close to a piece that could easily have had many more sections or movements.

Each movement in Polyrhythmicana maps out a specific timbral and/or rhythmic terrain through fluctuating accent and stress patterns, as well as through timbral modifications such as sul ponticello. The composition clearly owes a debt to Henry Cowell but also resembles the important work done by Conlon Nancarrow, except that Burtner composes his expanding and contracting pulse streams onto a variety of instruments with noise added for seasoning. Burtner’s use of noise does not merely encompass the sonic, but also includes semiotic noise in which various associations (like the passing of time represented by a ticking clock sound) or meanings are suggested, subverted, and masked.

The final piece on this disc, (dis)Sensus (2008), is an explosive, multi-movement piece that explores principles of formal contrast, dissent, and consensus. According to the liner notes this piece was inspired by the political philosophy of Jacques Rancière. Rancière is known for his ideas about disagreement and visual aesthetics. The percussionist plays the role of a provocateur, at times mocking the saxophone soloist by playing a saxophone mouthpiece, and doing the same to the piano soloist by playing on a toy piano. In the first movement, called Dissensus, the percussionist injects loud bursts of...
snare drum noise in order to initiate sectional changes, and writes a quotation from Rancière’s work with a pencil on paper that is amplified and used by Burtner’s computer program to generate chaotic pulse patterns that sound as if they are triggered every time the pencil is replaced on the paper after first being lifted up, presumably between words, or at the ends of sentences. All of this happens in just 32 seconds.

_Sxape_ immediately follows the end of _Dissensus_. This movement is ushered in with the attack of a small bell, followed by sustained resonance produced by the computer and the ensemble playing a micropolyphony of attack points. Underneath this is an ominous, low-frequency rumble sound. The saxophone, featured in this movement and performed by the composer, oscillates between raucous multiphonics and more-refined materials.

_Modification 1_, the third movement, is a short, 24-sec exercise in atonal polyphony, initiated, and brought to a close, by rim shots on the snare drum. The movement _(vio)Lens_ offers a potpourri of styles and musical inflections mixed into a tasteful mélange. The sounds are so well integrated that it is difficult to tell the difference between the extended acoustic sounds and their electroacoustic counterparts or modifications. Along with these, the composer presents us with the by-now familiar pulse fields, but in more urgent and distorted forms. One timbre sounds suspiciously like it came from an early video game soundtrack (i.e., Pac-Man). It accelerates right up to the end of this movement, accompanied with fast, spiccato glissandi in the violin. In video game music, this technique usually accompanies ever more difficult challenges faced by the gamer as time is running out. To include this sonic trope in a piece of concert music is highly suggestive.

_Modification 2_ begins with a barrage of snare drum attacks sounding like fireworks or gunshots. Following this the violin performs a series of high-frequency glissandi suggestive of certain insects or birds. This, in turn, is followed by a dense, atonal piano barrage straight out of the Cecil Taylor songbook, punctuated by the percussion and scratchy violin sounds. All this transpires within the space of 37 seconds.

The sixth movement, _ianopianop_, focuses on the live processing of sound. The piano and vibraphone sharply attack notes that are then processed through filtering, reversal, and spatialization techniques. There is also a pronounced emphasis on harmonic resonance. This movement could have benefitted from a longer duration than its 4-min length. A longer duration would have allowed for changes of textural density and for instrumental variation.

_Sensus_, the last movement, begins with a motoric, tutti pulse pattern not unlike the octave Cs (C7 and C8) in Terry Riley’s _In C_. Surprisingly, 20 seconds into this 95-sec movement, the ensemble performs a crazed, circus-like series of asymmetrical rhythms that would have made Frank Zappa proud. As if to underscore the circus quality, midway through the piece we hear a whistle, loud airstream sounds, humorous bird sounds, and a clave-like sound (all of which can also be found in Zappa’s compositions).

Given the variety of styles and techniques found in the pieces and movements on this disc, pinpointing Burtner’s compositional style seems near impossible. Nevertheless, Burtner has consistently applied the tools of his trade, even in cases where the sonic surfaces are markedly disparate. _Noise Plays Burtner_ offers us some intriguing approaches to electroacoustic composition in which live instruments engage with interactive technologies. The Noise performers are seasoned professionals, as is clearly evident from their fine performances. The computer-generated parts are timbrally integrated with the live performers so well that it is difficult at times to tell them apart. One gets the impression after hearing this disc that the compositional ideas contained therein required the technologies and instruments that were used, and this is no trivial accomplishment.