Massachusetts Institute of Technology

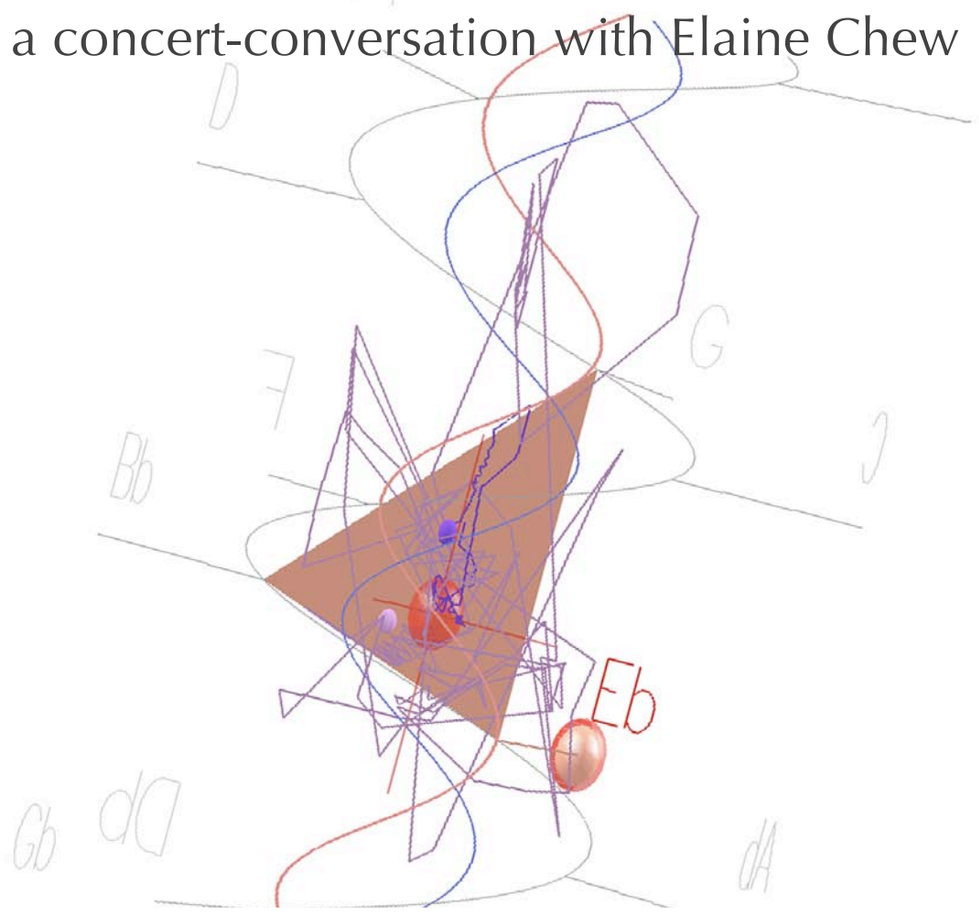
Jointly organized by the MIT Department of Mathematics and Music & Theater Arts Section

Sponsored in part by the Council for the Arts at MIT

APPLIED MATHEMATICS COLLOQUIUM

The Mathematics in Music

a concert-conversation with Elaine Chew



MONDAY | MAY 12, 2008 | 4:30 PM

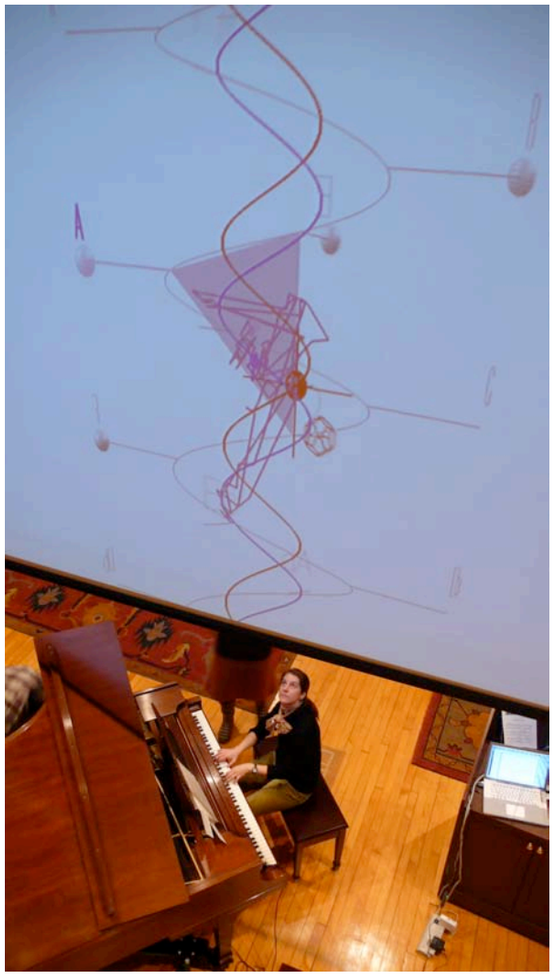
Reception at 4:00pm outside Killian Hall

MIT KILLIAN HALL | 14W-111

160 Memorial Drive, Cambridge MA 02139

PRESENTED BY ELAINE CHEW AND ALEXANDRE FRANÇOIS AS PART OF THE ACTIVITIES OF THEIR RESEARCH CLUSTER ON ANALYTICAL LISTENING THROUGH INTERACTIVE VISUALIZATION AT THE RADCLIFFE INSTITUTE FOR ADVANCED STUDY

About MuSA.RT



Music on the Spiral Array . Real-Time (MuSA.RT) is the result of collaboration between Elaine Chew and Alexandre François. It explores the use of Chew's (2000) Spiral Array model in real-time analysis and visualization of tonal music, and is implemented using François' Software Architecture for Immersipresence (2001, 2004).

MuSA.RT maps real-time MIDI (Musical Instrument Digital Interface) input to the Spiral Array, a geometric model for tonality comprising of an array of nested helices. The analysis and graphical rendering reveal the presently active set of pitch classes, and higher level constructs, such as the current chord and key.

Two Center of Effect (CE) trails, show the history of the tonal trajectories. The three-dimensional model dances to the rhythm of the music, spinning smoothly so that the current triad forms the background for the CE trails. The real-time MIDI is captured from an acoustic piano through a Moog piano bar

Scientific and video documentation of MuSA.RT can be found at the project website - *www-rcf.usc.edu/~mucoaco/MuSA.RT*.

Photo: Composer Lisa Bielawa plays with the MuSA.RT system at the Radcliffe Gymnasium, January 16, 2008. Photo by E. Chew.

Chew, Elaine (2000). *Towards a Mathematical Model of Tonality*. Ph.D. dissertation, Operations Research Center, Massachusetts Institute of Technology, Cambridge, MA.

Alexandre R.J. François and Gérard G. Medioni (2001). A Modular Software Architecture for Real-Time Video Processing, *Proceedings of the International Workshop on Computer Vision Systems*, pp. 35-49, Vancouver, B.C., Canada.

Alexandre R.J. François (2004). A Hybrid Architectural Style for Distributed Parallel Processing of Generic Data Streams, *Proceedings of the International Conference on Software Engineering*, pp. 367-376, Edinburgh, Scotland, UK.

The Mathematics in Music

a concert-conversation with Elaine Chew

Music is nothing but unconscious arithmetic.
~ Gottfried Wilhelm von Leibniz

Program

Discussion on tonality and melodic transformations by E.C.

Performance of FÊTES – VARIATIONS ON HAPPY BIRTHDAY (1975)
by Ivan Tcherepnin

with tonal analysis/visualization using MuSA.RT by E.C. and A.R.J.F.

Discussion on metrical permutations by T.D. and E.C.

Boston premiere of SUDOKU VARIATIONS * (2006)
by Tamar Diesendruck

Discussion on recombination by E.C.

Boston premiere of A SIMPLE GIFT FOR ELAINE * (2008)
by Rodney Waschka II

Discussion on tonal combinations by E.C.

Performance of DOUBLES III * and EPILOGUE (1998-1999)
precious jewel, spring song, floating
cockatoo, riversong, sampan variations
epilogue (in memoriam William Albright)
by Peter Child

* composed for Elaine Chew

About the Presenters

Elaine Chew is the 2007–08 Edward, Frances, and Shirley B. Daniels Fellow at the Radcliffe Institute for Advanced Study at Harvard, and an Associate Professor at the University of Southern California (USC) Viterbi School of Engineering, in Industrial and Systems Engineering, and Electrical Engineering, and (soon) the USC Thornton School of Music. At USC, she was the first holder of the Viterbi Early Career Chair, and founder of the Music Computation and Cognition Laboratory. She was honored in 2004/05 by the NSF Career and PECASE awards, respectively, for her pioneering efforts in integrating research and education at the intersection of music and engineering.

Elaine holds diplomas and degrees in piano performance from Trinity College, London (FTCL & LTCL). She received a BAS in Mathematical and Computational Sciences (honors) and in Music Performance (distinction) from Stanford University. She earned her PhD and SM degrees in Operations Research from MIT, with an interdisciplinary dissertation on mathematical modeling of tonality, supervised by Jeanne Bamberger, and co-advised by Georgia Perakis.

A proponent of contemporary and eclectic repertoire, she continues to perform widely as chamber musician and soloist. Elaine has appeared in concert at venues and festivals such as Los Angeles' Newman Recital Hall at USC, Zipper Hall as part of the Music of Changes concert series, Boston's Jordan Hall as part of the Foundation for Chinese Performing Arts Recital Series, the Rockport Chamber Music Festival as a featured young artist, the Singapore Embassy in Washington D.C. as part of the Embassy Series, and Victoria Concert Hall as soloist with the Singapore Symphony Orchestra in the President's Charity Concert.

She has premiered compositions by, and worked with, contemporary composers Chen Yi, Peter Child, Chris Dench, Tamar Diesendruck, Jose Elizondo, John Harbison, Cecilia Heejeong Kim, Alba Potes, Eric Sawyer, Paul Schoenfield, Ivan Tcherepnin, and Rodney Waschka II. She has recorded Peter Child's Doubles III, written for her and based on songs from her childhood (Albany Records), and his Trio for violin, clarinet and piano (Neuma Records). Her performance of Poulenc's Sextuor with the East Winds Quintet, the Lehigh University faculty wind ensemble, airs frequently on WDIY, the public radio station in the Lehigh Valley; her performance of Ivan Tcherepnin's Fêtes - Variations on Happy Birthday can be heard on WGBH's Art of the States program. She has initiated and participated in the multimedia concerts *The Mathematics in Music* (Los Angeles, Singapore, Vancouver, North Carolina), *Flying Sonics* (USC), and *Dark Blue Sky Dream* (Oakland Planetarium).

At MIT, she was one of three student pianists selected by John Harbison to accompany Yo-Yo Ma in an open rehearsal of his Cello Concerto in 1994. A 1997 MIT Science and Technology Initiative (MISTI-China Program) grant resulted in a field study and numerous concerts on contemporary Chinese piano music. In 1998, she received MIT's prestigious Laya and Jerome Wiesner Award for

"Take, for example, the individual movements of my piano piece Doubles. Many of these are meant to be specific in terms of their affective connotations. However, in most instances they were composed before I named them, and in naming them I simply attended to the emotional associations that they evoked in me."

All of Doubles III are in two keys with the exception of Floating. The keys are frequently highly disparate, for example: Precious Jewel and Spring Song are in keys only a half step apart, G major and Gb major, and C minor and B minor, respectively; the Sampan Variations are in F major and B major (a key closely related to F# major); and, the spritely Cockatoo combines a key with no accidentals and one with six flats, C major and Eb minor. It turns out, for the performer, that making distant keys sound distinct is a much easier task than when the keys are closely related (i.e. in the same mode and sharing many accidentals), as in the case of Riversong, which is in the keys of Eb major and Gb major, having three and six flats respectively. Occasionally, the two hands switch keys, as in the case of Spring Song, where the two keys toggle incessantly between the two hands, and in the sometimes jazzy, sometimes undulating, Sampan Variations. The uni-tonal Floating comes as relief from the bitonal dissonance in the middle of the set, and ends with the New England touch of fading bells tolling as the boat drifts away from the buoy.

Like dessert at the end of a good bi-tonal meal, the Epilogue, written in memoriam to William Albright, is a quirky but graceful rag.

[1] Why Compose? Paper presented to the MIT Music and Theater Arts Visiting Committee on October 29, 2002. Url - *web.mit.edu/child/www/whycompose.html*

Doubles III (1998-1999)

COMPOSED BY PETER CHILD, WELLESLEY, MASSACHUSETTS, 1998-1999
Written for Elaine Chew
Notes by, Elaine Chew, January 18, 2007, revised May 9, 2008

Peter Child's Doubles is a set of three sets of mostly bi-tonal character pieces for piano, bookended by a prologue in homage to Messaien, and a rag in memoriam to William Albright, Child's composition teacher, and a prolific composer and performer of ragtime. Doubles I (the first set) is dedicated to the composer's elder daughter, Madeleine (Maddie), the Doubles II to MIT pianist and pedagogue David Deveau (who gave the world premiere of both Doubles I and II), and Doubles III to myself, a former student of Deveau's, and then a PhD candidate in Operations Research, and an Affiliated Artist of the Music and Theater Arts section at MIT.

In the fall of 1998, I had just returned from a summer field trip to collect and research contemporary Chinese piano music in Beijing, and was preparing for a series of recitals featuring this newly acquired music, when Peter told me that he was working on a third set of Doubles pieces, this time for me, and that he had completed the first one, an atonal, romantic, Chopin-esque Mazurka. We cannot quire remember who came up with the idea first: to make the music more personal for me, Peter decided/agreed to base the next pieces on tunes from my childhood that I had learned in Chinese and Malay. I faxed Peter the first set of melodies, from which grew the Doubles III pieces based on `three Chinese Songs.' After he finished the Chinese set, he offered to write a few more; this time I sent him a few Malay song melodies, from which he selected three for the second set.

The three Chinese pieces — Precious Jewel, Spring Song, and Floating — are based on songs about: (1) a mother's love; (2) the bird of spring (this song is also known as the Dance of Youth); and, (3) the small white boat (moon) on the silver river (milky way). The three Malay pieces — Cockatoo, Riversong, and Sampan Variations — are based on songs about: (4) a two-teethed old sister cockatoo, Burong Kakak Tua; (5) the Bengawan Solo, the longest river on the island of Java; and, (6) rowing (Dayung Sampan, the Malay equivalent of "Row, row, row your boat"). With the explosion of information on the Internet, I have since discovered that three of these songs are not folksongs, but were compositions that had entered the vernacular. Dance of Youth is by Wang Luobin, who transcribed and adapted many Chinese minority folksongs. Popular in Korea, China, and Japan, Small White Boat was composed 1926 by Yun Geuk Yeong, and known as Bandal (half moon) in its original Korean. Bengawan Solo was composed 1940 by Gesang Martohartono. On the other hand, Dayung Sampan has been appropriated by the Taiwanese singer Teresa Teng and popularized as a courting song about a girl's sugary sweet smile. Burong Kakak Tua is a folksong from the Moluccas, and the origins of In All the World, Mother is the Best remains unknown.

Peter was not aware of the words to these melodies, the titles of the songs, or the stories behind them, when he composed the pieces. It is remarkable that the resulting compositions fit so well the character of their original songs. Is it possible that such simple melodies can be imbued with the character of the songs, so much so that Peter responded to their underlying emotion character when composing the pieces. The names for the pieces were chosen afterwards. Peter writes, when he presents the Doubles pieces in 2002 to the MIT Music and Theater Arts Visiting Committee [1], her "sustained, ubiquitous, unfailingly enlivening contribution to our musical life at MIT" (John Harbison). According to pianist David Deveau, "[Elaine is a] brilliant and versatile pianist, who has distinguished herself in the United States and abroad as a performer of elegance, taste and virtuosity ... one of the most remarkable musicians ever to grace our section." She subsequently served as Affiliated Artist of MIT's Music and Theatre Arts, and as founder and artistic director of the MIT-based Aurelius Ensemble until 2000.

Elaine was born in Buffalo, New York, and spent her childhood in Singapore, where at age 16, she was the youngest of four finalists to solo with the Singapore Symphony Orchestra at the Diners Club Pianist of the Year Competition; she subsequently went on to garner awards at other national competitions. She studied piano primarily with Ong Lip Tat and Goh Lee Choo in Singapore, James Goldsworthy and George Barth at Stanford, and David Deveau at MIT. She studied chamber music with Marcus Thompson, John Harbison, Lynn Chang, and Jean Rife at MIT, and with Phillip Levy at Stanford; and, vocal repertoire with John Oliver (MIT), and Judith Bettina (Stanford).

Alexandre R.J. François is a 2007-2008 Fellow of the Radcliffe Institute for Advanced Study at Harvard University. He is on leave from the University of Southern California, where he currently holds an appointment as a Research Assistant Professor of Computer Science in the USC Viterbi School of Engineering. From 2001 to 2004 he was a Research Associate with the Integrated Media Systems Center and with the Institute for Robotics and Intelligent Systems, both at USC.

His research has focused on the modeling and design of complex dynamic (software) systems, as an enabling step towards the understanding of perception, cognition and interaction. He is creator of the Software Architecture for Immersipresence (SAI), a general formalism for the design, analysis and implementation of complex software systems. His Modular Flow Scheduling Middleware (MFSM; mfsm.sourceforge.net) provides an open source implementation of SAI's abstractions. Leveraging the SAI/MFSM framework, his experimental courses in software development, graduate and undergraduate, pool the efforts of the entire class on a single, ambitious collaborative project.

François received the Diplôme d'Ingénieur from the Institut National Agronomique Paris-Grignon (France) in 1993, the Diplôme d'Etudes Approfondies (M.S.) from the University Paris IX - Dauphine (France) in 1994, and the M.S. and Ph.D. degrees in Computer Science from USC in 1997 and 2000 respectively. François is a Member of the ACM, ACM SIGMM, ACM SIGGRAPH and ACM SIGSOFT; he is also a member of the IEEE and IEEE Computer Society.

In 2007-2008, Elaine and Alex form the cluster on Analytical Listening through Interactive Visualization at the Radcliffe Institute for Advanced Study. The cluster's activities are documented at the website – *www-rcf.usc.edu/~mucoaco/Radcliffe*

About the Composers

Peter Child (b.1953) Peter Child is Professor of Music and MacVicar Faculty Fellow at MIT, where he chaired the department of Music and Theater Arts from 1996 to 1999. He joined Reed College in 1973 through an exchange scholarship from Keele University in England and received his B.A. in music from Reed in 1975. After studying Karnatic music in Madras for a year through a Thomas J. Watson Fellowship (1975-76), he entered the graduate program at Brandeis University and earned his Ph.D. in musical composition in 1981. His composition teachers include William Albright, Bernard Barrell, Arthur Berger, Martin Boykan, Jacob Druckman (Tanglewood) and Seymour Shifrin.

Child has been awarded an American Symphony Orchestra League-Meet the Composer "Music Alive" residency with the Albany Symphony Orchestra for 2005-08; he is also composer in residence with the New England Philharmonic Orchestra for the same period. His compositions won the 2001 Music of Changes award, which culminates in a commission and a concert in Los Angeles devoted to his music. He was a recipient of a 2000 commission from the Harvard Musical Association and a 1998 commission from the Fromm Foundation at Harvard University. In 1994 the Council for the Arts at MIT awarded Peter Child the Gyorgy Kepes Fellowship Prize. He has been honored by two Composition Fellowships from the Massachusetts Artists Foundation in 1986 and 1989, as well as fellowships to the MacDowell Colony and the Composers' Conference. The Massachusetts Council on the Arts and Humanities awarded him four 'New Works' commissions in conjunction with the Boston Musica Viva, the New England Conservatory Contemporary Ensemble, the MIT Experimental Music Studio, and the Cantata Singers. His compositions have also been awarded prizes from Tanglewood (Margaret Grant Memorial Prize, 1978), East and West Artists (First Prize, 1979), WGBH Radio (Recording Prize, 1980), New England Conservatory ('New Works' Prize, 1983), and League-ISCM, Boston (New England Composers Prize, 1983). Recordings of some of Child's music have been recorded on New World, Albany, Innova, CRI, Neuma, Rivoalto and Centaur compact discs. In addition to his compositional work, Child has published papers concerning music by Shostakovich and Bartok in Music Analysis and College Music Symposium. He won the 2004 Levitan Award in the Humanities at MIT to support his work in musical analysis.

Peter Child has written music in many different genres, including music for orchestra, chorus, computer synthesis, voice, and a wide variety of chamber groups. Ensembles that have performed his music include the John Oliver Chorale, the Pro Arte Orchestra, the Lydian String Quartet, Collage, Parnassus, New York New Music, the Pittsburgh New Music Ensemble, Lontano (Great Britain), Interensemble (Italy), Speak Percussion (Australia), and many others.

Mirrored from the composer's website - *web.mit.edu/child/www*
Photo by Donna Coveney

3	8	9	2	1	4	5	6	7
6	5	2	7	3	9	8	4	1
7	4	1	6	8	5	9	2	3
8	6	3	9	4	2	1	7	5
2	9	4	5	7	1	6	3	8
5	1	7	3	6	8	4	9	2
4	2	6	8	5	7	3	1	9
9	3	8	1	2	6	7	5	4
1	7	5	4	9	3	2	8	6

freely to create a musical narrative. "Sticking with the notes" should be interpreted loosely, however, as it involved many transformations, some traditional (inversion, transposition), some not. Through such mutations, these "musical bits" take on different identities, yet the process seems to insure that there are shared qualities across the variations.

One advantage of this project was knowing that Elaine would play the premiere. In addition to her technical virtuosity and musical spirit, I knew she would be able to project the strange balance of elements in the piece. Using my idea results in a work, that like the original Sudoku grid, has an overall design, but in which each element is stubbornly itself. In addition, the piece has a volatile, mercurial quality, from a kind of nonchalance and mock drama to a few surprising passages of unexpected emotion. So, what started out as an idea that really shouldn't work, resulted in a project that was fun, and satisfying to work out. I hope it is as fun and satisfying for Elaine and the audience.

A Simple Gift for Elaine (2008)

COMPOSED BY RODNEY WASCHKA II, RALEIGH, NORTH CAROLINA
Notes by Rodney Waschka II, February, 2008

A Simple Gift for Elaine was composed for pianist and scientist, Dr. Elaine Chew. Prof. Chew indicated that she would enjoy having a chance to perform a work based on the Shaker song Simple Gifts composed by Elde Joseph Brackett. It is believed that Brackett wrote Simple Gifts in 1848 in the Shaker community of Alfred, Maine. The tune has been used by a number of composers, most famously by Aaron Copland in his music for the ballet Appalachian Spring from 1944. Naturally, with such competition, I set forth with some trepidation. The tune is heard at the beginning of the work. I employed a computer program of my own design based on a genetic algorithm in the composing of this piece. Dr. Chew gave the premiere performance of A Simple Gift for Elaine at North Carolina State University.

Additional notes by Elaine Chew, April 1, 2008

A Simple Gift for Elaine is composed by Rodney Waschka II using genetic algorithms (GAs). The composer provides the initial populations, which evolve over a few generations. Rodney takes a purist approach to using GAs in musical compositions, in that he uses every generation that succeeds the initial population. As the composer puts it, “All God’s children deserve a little lovin’.” The piece is generated from two different initial populations. The first initial population is introduced after a statement of the melody, and three successive generations follow. Crossover operations recombine the material from one generation to the next; mutations result in rests. The second initial population enters, with only one succeeding generation, and the first generation of the original population and the first initial population rounds up the piece.

chords in the wrong key — Ab major instead of C (a musical joke ... if one is not listening carefully, one is liable to clap at this point), before the composer gives the true cadence.

Sudoku Variations (2006)

COMPOSED BY TAMAR DIESENDRUCK, LOS ANGELES, CALIFORNIA, DECEMBER 2006
Notes by Tamar Diesendruck, January 7, 2007

As the listener probably knows, the game of Sudoku involves filling in numbers in a 9 X 9 grid such that each line, as well as each inner square of 3 X 3 contains one of each numeral from 1 to 9. Numbers therefore can't repeat in any direction. So what does this have to do with music? In the case of this piece, the numerals are used to determine meter; each variation uses the numerals from one line of the grid; therefore, each variation is 9 measures long, and each measure has a different time signature from 1 pulse to 9 pulses per measure, and none of the patterns repeat.

Originally, I started fooling around with the concept of using Sudoku numbers as meter simply because as I was contemplating a completed puzzle, I noticed that I was inwardly feeling the pulses for each number. What a dandy idea, I thought, to map a Sudoku puzzle to a composition's rhythmic groupings. As it turns out, at least the way I started to conceive of making a piece, it was quite challenging. I liked the idea of creating music for each number (meter) that would always be associated with that number, and the idea that these musical fragments could work with one another in any order. This would be fine if I didn't care at all about musical continuity or closure, but, ... I do; I think my fascination with this idea was in the paradox and challenge of creating the sense of continuity and (occasional) closure while projecting each numeral with its own particular musical identity each time it appears (so the same material has to be convincing in any part of a phrase or section). There was also the matter of creating more than one musical line, and incorporating into the piece some of the elegance of the Sudoku grid design, in which every numeral fulfills multiple functions.

The final design of my piece introduces a musical fragment for each numeral in the first 9 bars which together form a playful tune in the left hand, accompanied in the right hand by one note at the start of each bar. This opening variation plus the next 8 variations follow the numbers of the grid horizontally from left to right, reading the rows in order from top to bottom; the second 9 variations use a combination of the horizontal rows and the vertical columns, (read from top to bottom, in order from left to right). So each hand expresses a different series of meters, and each of these variations is a simultaneous projection of two lines of the grid, one horizontal, one vertical. The 19th and last variation closes off the set by reusing the first horizontal row, this time in reverse order, to end on the opening square's 3 pulses.

The primary challenges in fulfilling this abstract and eccentric idea were to create a larger sense of shape, and to find ways to make the continuity of each series of meters seem musically interesting (if not necessary). My game was to project the numbers of the grid by expressing each one with the fragments of music I created for these numbers from the first horizontal line of the grid; I decided to stick with the notes conceived in the first variation, but use tempo, texture, register, and dynamics

Tamar Diesendruck's favored compositional medium is virtuosic chamber music, although she has also composed solo, orchestral and vocal works. Her music is often characterized as having a very wide range of expression. Works include experimental pieces like "8 —> ∞" for eight cellos (eight tends toward infinity), and unusually slow, stark music like "the grief that does not speak". Prof. Diesendruck's work has been performed throughout the U.S., and in Europe, by an array of excellent performers including the Pro Arte Quartet, Boston Modern Orchestra Project, Lions Gate Trio, Speculum Musicae, New Millenium Ensemble, Dinosaur Annex, Phantom Arts Ensemble, San Francisco Contemporary Music Players, New Century Players, League of Composers-ISCM, Earplay, Musica D'Oggi, Composers, Inc., Parnassus, Washington Square Contemporary Music, Prism Players, Music on the Edge, San Francisco Chamber Singers, Pittsburgh Youth Symphony Orchestra, Cabrini Quartet, pipa virtuoso Wu Man, avant garde violinist Carla Kihlstedt, pianist Donald Berman, and numerous other groups and soloists.

Prof. Diesendruck earned an M.A. and Ph.D. in Composition from the University of California, Berkeley and a B.A. from Brandeis University. Her work has been supported with a series of grants, fellowships, commissions and residencies, most notably a Guggenheim Fellowship, Bunting Fellowship awarded by the Radcliffe Institute, Rome Prize awarded by the American Academy in Rome, Koussevitzky Foundation Commissions, Fromm Foundation Commission, Mellon Post-Doctoral Fellowship, the Academy Award, Goddard Lieberson Fellowship, and Ives Award from the American Academy of Arts and Letters, Copland Fund Recording Grants, several grants from the Pennsylvania Council on the Arts, and numerous residencies at The MacDowell Colony, Bellagio (Rockefeller Foundation), Yaddo, and the Djerassi Foundation. She has served on the faculties of a number of distinguished American institutions, including the New England Conservatory, Berklee College of Music, the University of Pittsburgh, and most recently, for three years at the University of Southern California Thornton School of Music.

Ivan Tcherepnin (1943-1998) was born in Paris, France, in 1943 to noted pianist and pedagogue Ming and composer Alexander, son of composer-conductor Nikolai. Tcherepnin studied music at Harvard, principally with Leon Kirchner, as well as in Europe with Pierre Boulez and Karlheinz Stockhausen. Like several other gifted composers of his generation, the young Tcherepnin developed an expertise in electronic music media. After holding positions at the San Francisco Conservatory of Music and Stanford University, Tcherepnin joined the music faculty of Harvard University in 1972, where he also served as Director of the Harvard Electronic Music Studio until his death in 1998. Ivan's two sons, Stefan and Sergei, continue the musical legacy of the Tcherepnins.

Tcherepnin frequently conducted and lectured in Europe, Asia and the US, and held composer residencies with Music at Marlboro, Rockefeller Center at Bellagio (Italy), Dartington Summer Music School (England) Santa Fe Chamber Music Festival, and Korsholm Music Festival (Finland). His numerous honors included awards from the American Society of Composers, Authors and Publishers and the National Endowment for the Arts. Notable among his many commissions was a series of works for the American Wind Symphony Orchestra. His Double Concerto for Violin, Cello, and Orchestra (1995), written for two of his former students, violinist Lynn Chang and cellist Yo-Yo Ma, won the prestigious International Grawemeyer Prize. The concerto is studded with now humorous, now adoring quotations from great Romantic concertos (including the Brahms Double Concerto) as well as John Coltrane.

Adapted from the composer's bio at *www.tcherepnin.com/ivan/bio_ivan.htm*
Photo from *grawmeyer.org*

Rodney Waschka II, composer, is best known for his operas and algorithmic compositions. His music has been performed throughout the United States, in Canada, Mexico, Russia, England, Scotland, Ireland, Spain, Portugal, Germany, The Netherlands, Switzerland, Belgium, Yugoslavia, Bulgaria, Norway, Japan, China, Argentina, Columbia, Puerto Rico, Jamaica, Israel, South Africa, and elsewhere. Important festivals and concert halls where his works have been performed include the International Computer Music Conference, the Society for Electro-Acoustic Music in the US festival, the World Saxophone Congress in Montreal, Merkin Concert Hall in New York, the Sheremetev Palace in St. Petersburg, Russia, the International Review of Composers in Belgrade, the Purcell Room in London, the Museo Reina Sofia in Madrid and many others.

The North Carolina Arts Council, The National Endowment for the Arts (USA), Meet The Composer, the Fundacion Valparaiso (Spain), the Texas Composers' Forum, and other groups and individuals have supported the composition, performance, and recording of Waschka's works. Waschka's pieces are recorded on the Capstone, IRIDA, Centaur, and AUR labels (USA), Ama Romanta, Candy Factory, and Plancton labels (Portugal), and the PeP label (Canada). His music is published by Borik Press (Raleigh) and American Composers Editions (New York City).

Waschka's teachers include Larry Austin, Thomas Clark, Paul Berg, Clarence Barlow, George Lewis, Charles Dodge, Robert Ashley, and Joel Ryan. He received his doctorate from the University of North Texas and also studied at the Institute of Sonology -- The Royal Conservatory of The Netherlands, and Brooklyn College. Waschka teaches at North Carolina State University.

About the Music

Fêtes - Variations on Happy Birthday (1975)

COMPOSED BY IVAN TCHEREPNIN, BELLAGIO (ITALY)
Probably written for Leon Kirchner
Notes by Elaine Chew, January 18, 2007

I first contacted Ivan Tcherepnin between 1995 and 1996, upon the recommendation of one of his former students Lynn Chang, when I was creating a concert program of Chinese and Russian music. His father, Alexander was instrumental in encouraging Chinese composers to write in their own style through his own teaching, and by creating composition competitions in China for young composers, and thus shaped the contemporary Chinese musical genre. I called Ivan to get recommendations on pieces his father, a Russian composer, might have written in the Chinese style, influenced by the years he spent in China. Ivan kindly recommended that I look at Alexander's Five Chinese Concert Etudes. I subsequently performed the Shadow Play from the set and sent Ivan a copy of the tape. I didn't think much of the tape until I attended a lecture by Ivan at Harvard, and was pleasantly surprised when he used my recording as an example of his father's compositions.

Ivan Tcherepnin passed away in 1998, and his memorial service was attended by many in Paine Hall at Harvard. When Sue-Ellen Hershman-Tcherepnin, Ivan's wife, was sorting through his music, she came across a copy of a score for Ivan's Fêtes - Variations on Happy Birthday and decided to give it to me. In early 2000, the Aurelius Ensemble, a music group I had founded at MIT, put together a concert of music by members of the Tcherepnin family, including a newly commissioned piece by Stefan (Ivan's son), in celebration of the 100th anniversary of Alexander's birth. It was on this occassion that I first performed Ivan's Fêtes. Ivan's grown-up daughter, Sarina, who was at the concert, came up to me afterwards and exclaimed that I played it better than her father could have imagined.

The variations on Happy Birthday were probably written for Leon Kirchner, Ivan's former composition teacher. In the variations, the composer explores the gamut of musical styles from Baroque to Jazz, and the full range of the piano keyboard from the lowest note to the highest. All forms of the familiar Happy Birthday melody are employed — as-is, in fragments, inverted, in retrograde, in retrograde inversion, augmented, in stretto (in layers of the above), interleaved between the two hands, interspersed between the melodic lines. The composition also spares none when it comes to expression, the chorale-like calm declaration of the theme soon gives way to the quirky fugue on the retrograde inversion of a Happy Birthday fragment, and rhapsodic interludes. The whimsical gigue layers a remarkable number of combinations of the melodic transformations. At the apex of the composition, we arrive at the furious thumping of Happy Birthday at the lowest registers of the keyboard, that then dissolves into the music-box-like tinkling of Happy Birthday inverted on the uppermost keys on the piano. A walking bass leads into the jazzy last section, with accented notes outlining the profile of Happy Birthday. A grandiose organ-like cadenza heralds the end, which harks back to the chorale opening. The serene closing is interrupted by loud and clumsy