A Conversation with Miller Puckette: 2008 SEAMUS Award Recipient

by Kurt Stallmann

SEAMUS 2008 Award Recipient, ***MILLER PUCKETTE***, is one of the most admired practitioners of musical computing in the world today. His long history of developing interactive, live-performance possibilities on the computer while collaborating with composers at IRCAM have put him at the forefront of real-time musical computing. As the inventor of Max 20 years ago, Puckette has been a visionary in the field ever since. Last year, in May 2007, Puckette released the published version of his book "The Theory and Technique of Electronic Music" after several years of working on it. In addition, he continues to develop his free software descendent of Max called Pd (Pure Data), a real-time programming environment for audio, video, and graphical processing.

Related Links:

Pd software: http://crca.ucsd.edu/~msp/software.html
Pd community: http://puredata.info/

The Theory and Technique of Electronic Music:
http://www.worldscibooks.com/compsci/6277.html

Convolution Brothers (with Cort Lippe and Zack Settel)
http://www.music.buffalo.edu/lippe convolutionbrothers/toc.html
http://www.zeep.com/cbros/

At SEAMUS 2008 in Salt Lake City, over bowls of miso soup, I had the opportunity to sit down with Puckette to ask questions about his ideas, history, and current activities. When asked about his current projects, Puckette responded, "I have a date with a vibraphone!" He explained that he is updating the technology of Philippe Manoury's 1991 composition, ***Neptune*** (premiered at IRCAM). Manoury, with assistance from Puckette, is one of the earliest composers to incorporate score following with live digital processing. For this performance of ***Neptune***, for 3 percussionists (2 vibraphones, tam-tam, marimba) and electronics, Puckette was updating the pitch tracking mechanism for the vibraphone. Puckette reminisced how, in the early 90's, the IRCAM 4x computer took cues from the vibraphone's loudness to affect live digital processing and spatialization of sounds while a

DEVIANT.

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(Interview with Miller Puckette continued)

complex mechanism allowed vibraphone pitches to be tracked and followed using a score following program. To provide an example of how the computer acts to integrate the ensemble, Puckette described a section of the work when the vibraphone strikes isolated notes that trigger a filter bank to process a vibrating tam-tam – the resulting timbral chords from processed tam-tam are thus controlled in real-time via the pitches of the vibraphone. The updated version of ***Neptune*** was scheduled for its first American performance at the Spring 2008 UCSD Festival of New Music on a concert called: 'Reverberations: Music for Tam-Tam' alongside a performance of Stockhausen's ***Mikrophonie*** and a new work by Adam Wilson titled ***Osmosis***.

Puckette working on guitar

When I asked Puckette about his other current activities, outside of his traditional faculty responsibilities like serving on a search committee for a new composer, he mentioned that he is beginning to work on a new piece with Manoury for solo contrabassist Mark Dresser (UCSD faculty member). As part of the research for this work, Puckette is developing a new toolbox for analyzing sounds based on sinusoidal analysis and is working out new methods and transformations for resynthesis.

Another pet project is the development of a six-channel guitar pickup that provides six independent streams of sound for the computer to analyze as a sound source or as a control stream source. Following his aesthetic preference for home-built electronics, he designed and built the pickup and converter box that plugs into his computer. Playing guitar is something that gives him a lot of pleasure and he also enjoys occasionally performing with that notorious trio of provocateurs (along with Zack Settel and Cort Lippe) who call themselves "The Convolution Brothers."

HISTORY

Puckette first got involved with computer music in 1979 with Barry Vercoe at MIT (where he completed his undergraduate degree in 1980). Since the early seventies, Vercoe had been pursuing the idea of a real-time hardware digital musical instrument. Construction of that instrument was put on hold after his lab received the gift of a dedicated DEC PDP 11 minicomputer. With this dedicated machine, Vercoe realized that he could have enough power to begin experimenting with real-time synthesis while also having a stable platform for developing software. In 1973, the result was an early form of MUSIC 11 that eventually led to CSound (1985). After finishing his undergraduate degree in 1980, Puckette continued to work with Vercoe while simultaneously pursuing a higher degree in Mathematics at Harvard University (Ph.D., 1986). After just one year of work at MIT, Puckette realized that musical computing was a field that completely engaged his imagination and technical knowledge. As early as 1980, Puckette already began experimenting with real-time, one-dimensional conducting using the PDP11 at MIT. In 1985, Vercoe invited Puckette to join him to work on a research project at IRCAM. Puckette enjoyed the intense, collaborative atmosphere at IRCAM and stayed on to work there in the following years. In 1987-1988, as Puckette developed new interactive possibilities on the 4x and began his collaborative work with composer, Philippe Manoury, he began to assemble software programs that solved particular problems posed by composers for pieces. Eventually, these programs formed the basis of Max. Puckette reports that composer Frédéric Durieux, in his work ***Parcours pluriel***, used a prototype of Max in live performance for the first time in the early months of 1988 at IRCAM. He cites ***Pluton*** (1988-1989), Manoury's second work from his ***Sonus ex Machina*** series, as the first work to use Max in its complete form. In 1989, Puckette began to extend Max in a program called Max/FTS for the Ircam Signal Processing Workstation.

(Interview with Miller Puckette continued)

COLLABORATION

Given these celebrated early collaborations with Manoury, I asked Miller to describe how, in his view, their collaborative process works. He related it to a kind of 'play' between the participants. He said that Manoury, his principle collaborator, has a firm grasp on the conceptual ideas behind musical computing which is helpful as they explore potential materials during their exchanges of ideas. During the 'research phase' of the work, Puckette may come to a meeting with a specific technical possibility to examine as they develop the sonic range of the materials for the new work. He sees his relationship with the composer as a symbiotic one, where the interdependent creative and technical ideas fuse into a form of instrument development that serves the composer's musical intentions. He feels that the imagination emanating from an active musical life is an appropriate guide for programming development – with live studio experience forming the crucial underpinnings for constant feedback as an idea is shaped in sound. Puckette views the computer as a malleable instrument to be defined by the user. In this sense, he places the development of computer music into the continuum of musical instrument development. He is in the process of discovering new instruments in the service of fertile musical imaginations.

Puckette with Settel in a Convolution Broothers Performance.

TEACHING

In 1994, Puckette was appointed to the Computer Music faculty in the Department of Music at the University of California at San Diego. Not long afterwards, he was appointed to be the Associate Director of the Center for Research in Computing and the Arts (CRCA). Later, in 2004, Manoury joined the UCSD faculty in the music composition area. The collaborative experience that was so fruitful for Puckette and Manoury at IRCAM in the early 90's is something they have attempted to transplant into an American university environment at UCSD. Together, Puckette and Manoury, co-teach a seminar class. This full-year seminar brings together small multi-disciplinary groups. A typical group has three members: a performer, a composer, and a computer music researcher, and as a group they are charged with one main task: creating a new work that uses the musical and technical resources in a new way. Puckette understands that "when you have this kind of collaboration, everyone has to feel as though they are getting something out of it." By this he means that the performer is motivated to develop a new repertoire and set of techniques on his or her instrument; composers are motivated to create a new work with technical and instrumental support to realize new imaginative possibilities; and researchers

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are motivated to develop a new computer music tool that can become the basis for new areas of study. One unforeseen advantage to creating these teams in a university environment was the hands-on, can-do attitude of the performers in the group who want to be actively involved with the process. While many of the performing musicians Puckette worked with at IRCAM were masters of their instruments, they were hired by contract and often lacked enthusiasm for the technical process of development for a new work. Since many UCSD students are enthusiastically pursuing their own professional performance careers, their professional motivation permits the work of these groups to go forward without huge operating budgets. Already, the seminar is beginning to produce exciting new works and techniques. A couple of examples cited by Puckette include the use of dual video cameras to track percussion mallets and mallet strikes; and the development of a multi-channel pickup suspended over strings of a piano so that individual strings of the piano can be picked up discretely from one another.

While many of the key components to these collaborative successes are in place at UCSD, there are a few things the environment at IRCAM offers that are difficult to recreate in a university setting. At IRCAM, these collaborations are given at least two years to develop rather than one with large budgets and whole teams of support staff. There is also the matter of 'high stakes' when it comes to public premieres – where audiences include individuals like Madame Pompidou and other influential members of the French cultural community and press. A premiere at UCSD cannot have the same impact as a premiere at IRCAM. What is admirable, however, is that the Department of Music at UCSD has so confidently invested itself in the development of the new. This reaffirms its reputation as being among the most progressive, forward-looking music departments in the United States. The school boasts no fewer than six faculty members devoted to musical research using computers including Gerald Balzano, a psychoacoustician in the Critical Studies/Experimental Practices area; and members of the Computer Music faculty including Shlomo Dubnav, Tom Erbe, F. Richard Moore, Peter Otto, and Miller Puckette. Composers on the faculty like Roger Reynolds and Philippe Manoury have long histories of developing new works using current practices in technology and many on the performance faculty also have a history of working with and developing electronic resources to supplement performance practice. Puckette reports that this year marks the first group of Ph.D. graduates coming out of the Computer Music program at UCSD. These graduates are required to have produced original research in computer music that may involve new techniques for analysis, new software and/or hardware design, or ground breaking work with compositional structures, psychoacoustics, or cognitive science.

FUTURE

When I asked about the future of musical computing, Puckette pointed out that computer music is likely to develop at the level of the programming environment. He sees a need for more flexible and closer coordination between the interactive environment and the compositional environment and would like to see pathways developed between these two areas. An approach like this would help to bridge the gap between making scores and realizing them interactively. He also sees a rapid development in the use of live video as a tracking tool for live analysis, such as tracking movements of a dancer or performer, or tracking the placement of a gesture. As an example, Puckette imagines the video tracking of a drumstick on the head of a drum for timbral manipulations. There are, however, technical problems that have to be solved to make these tools more failsafe, for example, compensating for the effects of changing lighting, which can often cause video tracking to fail.

Finally, Puckette also feels that a large set of latent possibilities exist that haven't yet been discovered, in part due to current conventions in interactive performance. He feels that current conventional practices found in festivals of electronic music are in some ways responsible for putting electronic music into a musical 'bubble' that separates this practice from the general practice of making music. A few questions he asks are: why do we always insist on using massive speaker arrays that surround audiences that sit still? To provide an alternative example, he mentions a project that Max Mathews is currently imagining and working on where performers could walk into a room with a small suitcase, set the suitcase up (with an enclosed loudspeaker) and just begin to perform with a

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'conductor' leading all of the participants in an ensemble performance.

Another question he asks is why, in interactive music, do we often work against the instrument rather than with it? If the focus of a performer's activities are concentrated to produce specific sound qualities on their instrument, why not use that highly concentrated sound stream with it's encoded complexity as a source of control stream information rather than requiring the performer to split their attention by adding extraneous devices to the instrument to create control data streams? In other words, why not leverage the activity that the performer is trained to accomplish rather than asking them to do something else? It is true that this requires a different way of thinking about the real-time analysis of a signal and would require more subtle methods to decode the various aspects of change in the highly focused sound, but why not pursue this angle?

Why not make the break between the instrumental and electronic world absolutely transparent and create mixtures so convincing that one is unable to perceive any break between the two worlds? Why emphasize the quality of 'otherness' with electronics?

Why apply spatialization to materials that don't necessarily require it or when it is not necessarily appropriate? In essence, he argues for the return of electronic music to the general practice of making music as an expressive activity.

At SEAMUS 2008, many of these provocative questions arose in Puckette's tribute lecture to Vladimir Ussachevsky. Ussachevsky was a focal point of the conference due to his historic academic connections to the University of Utah. In the lecture, propelled by Ussachevsky's pioneering quest for the new, Puckette proposed to expand what he sees as an unnecessarily limited use of the computer in music. Puckette questioned many of the current conventions of computer musicians and asked for a sober assessment of ideas that have been developed over the past twenty years that have fundamentally changed the way computer is used for real-time performance. He argued that most of the techniques in use today were already discovered and used in the late 80's and early 90's and challenged composers to be more imaginative in their use of computers and electronics in their work. Tangentially, it is interesting to note that Ussachevsky, in part, had an interest in the University of Utah so that he could collaborate with an early pioneer of digital music, Ercolino Ferretti. Together, the two of them collaboratively taught an early class in the early seventies as they sought to explore the use of the computer to create music. This early team of Ferretti/Ussachevsky provides an historic analogue that is perhaps closer in spirit to the Puckette/Manoury team than is visible at first glance.

In closing, I asked Puckette what advice he might offer to a young person just starting in the field of computer and electronic music. His response was quite simple, yet characteristically challenging – don't be afraid to do it yourself. Don't be afraid to take out your math textbooks, your computer programming books, and learn what you need to assemble and shape your ideas. The act of doing and creating something on your own terms will immediately distinguish you from the hundreds of others who are doing what everyone else is. Follow your own sense of internal necessity. In conversation, Puckette respectfully pointed to Max Mathews, the grandfather of musical computing, as someone who has lived by this maxim and who is an inspirational source of energy and of ideas.

Puckette himself lives true to his own words. His unique contributions to the world of musical computing over the past twenty-plus years form an obvious body of evidence demonstrating his influence and leadership in the field. We offer him our congratulations on receiving the 2008 SEAMUS Award and sincerely thank him for all of the musical tools he has provided us to work with. We look forward, with eager anticipation, to the future and undoubtedly to his very active role in shaping it.