Nathaniel Bartlett: Modern Marimba³ Combining marimba and computer-generated sounds

By Kurt Gartner

I f you have the opportunity to experience one of his live performances, Nathaniel Bartlett is likely to change the way you think about music. Utilizing a seamless combination of contemporary composition and performance techniques for marimba and computer-generated sounds and effects, Bartlett is constantly challenging himself and his audiences. Whenever he performs or speaks about his projects, he demonstrates his passion and depth of understanding of all aspects of performance techniques, technology, and aesthetics.

The marimba is capable of a great subtlety and range of expression. Bartlett calls it "the instrument of our time." Therefore, it follows that any effective integration of electronics in performance would require high-end components, including the computer hardware and software, as well as all links within the sound reinforcement chain. As Bartlett puts it, we are in a time when popular technology is "marching backwards" in terms of digital audio. While the portability and convenience of mp3 players have made them ubiquitous in our culture, the data compression algorithms of these players can really attenuate the nuances of recorded music.

Bartlett is moving in the opposite direction, seeking an electronic system that actually enhances the finesse of marimba performance. Currently, his sound projection system includes eight loudspeakers and a subwoofer. The loudspeakers are arranged at the corners of the performance space—above, below, before, and behind the audience. The result is an "ambisonic" effect: true three-dimensional sound

that allows listeners to hear and process sounds, which, if not placed throughout the 3D auditory field, would seem much denser in texture. All of these sounds are generated at 96 kHz sampling rate and 24-bit depth, far exceeding the definition and dynamic range of CD audio and providing a match for the refinement of the marimba's tones.

To realize his performance concept of "modern marimba³"—the seamless fusion of his instrument with computers, electronics, and an eight-channel, cuboid speaker array—Bartlett has collaborated with composers who share both his vision and knowledge. Among Bartlett's first major projects was a collaborative effort with composer Allan Schindler, who is Professor of Composition at the Eastman School of Music and director of the Eastman Computer Music Center. Bartlett commissioned Schindler's work "Precipice – for solo marimba and computer-generated sounds" in 2003, and premiered the work in 2004. (Originally, Schindler developed the work for a four-channel ambisonic sound system, then adapted it for Bartlett's new eight-channel array.) In an excerpt from Bartlett's Website (www.nathan-ielbartlett.com), Schindler comments on the work:

This piece gave me the opportunity to explore the very wide range of textures and timbres available on extended five-octave marimbas. In the hands of virtuoso soloists employing contemporary four-mallet techniques the marimba often does not really sound like an ideophonic [sic] percussion instrument, but rather can convey almost vocal-like phrasings as well as an extraordinary range of colors. Many of the computer-generated sounds, especially during the latter half of the piece, were derived from recordings of Nate playing his marimba, but often this may not be readily apparent. Through granularization (slicing tones into tiny fragments, then stringing and intercutting hundreds of these sound grains per second into timbral "necklaces"), one can create timbres reminiscent of vocal, aerophone and other types of natural and environmental sounds."

Schindler's work is the centerpiece of Bartlett's 2006 debut recording, *Precipice – modern marimba*. Also included on the recording are "Interlude – for marimba and computer-generated sounds" by Greg Wilder, "Silhouettes" by Augusta Read Thomas, and "Vermont Counterpoint" by Steve Reich.

Bartlett's latest commission project again involves Schindler, in conjunction with a grant from the Fromm Foundation. Schindler's new work (tentatively titled "Take Flight") will fully exploit Bartlett's now-expanded eight-chan-

nel sound system and his vast array of pedals and velocity-sensitive triggers. In performance, Bartlett will exercise real-time control of the computer effects *and* certain aspects of the computer music itself, creating a much more organic musical situation for himself as the performer. Such works may include improvisation, performer-initiated computer events, and fixed elements.

Bartlett likens fixed elements of computer sounds generated within a performance with the fixed sets on the stage of a dance concert. Although the sets may be fixed, the dancers have the freedom to interact with the sets in different ways (e.g., relative to space and time). Similarly, Bartlett treats fixed (pre-recorded) elements of computer music as soundscapes around which he plays.

In addition to the integral nature of computer-generated sounds as compositional elements of his performances, Bartlett uses the real-time processing capabilities of his system to create a synthetic acoustical environment for the marimba itself. For example, he may assess the acoustical properties of a room as being too "dry"; subsequently, he can configure the computer effects to simulate the acoustical environment of a larger hall. This type of effect restores the singing, legato quality of the marimba in its optimal environment without sounding synthesized.

Because the loudspeakers are placed throughout the venue, Bartlett performs without headphones or monitor speakers. In this way, he can maintain the auditory perspective of a soloist performing with an orchestra—effectively adjusting balance and blend and hearing the composite sound in a context similar to that of the audience.

Barlett is as particular about the quality of his recording projects as he is about his live performances. Bartlett's recordings are produced as hybrid multi-channel super audio CDs. One of the key advantages of ambisonic audio recording and production is that it utilizes high-definition 3-D in "sound fields" (rather than the channel-specific placement found in theater-type surround-sound systems). Although he always performs live concerts using his own high-definition 3-D audio system, Bartlett's hybrid multi-channel super audio CD *Precipice – modern marimba* may be played back in several formats (i.e., super high-definition five-channel surround, super high-definition stereo, and CD stereo, which plays on normal CD players).

The works Bartlett performs emphasize concept of "spatialization," in which the placement of sounds in the 3-D field is essential to the compositions themselves. Lighting that draws attention away from the loudspeakers as "sources" of sound may enhance the auditory and psychological effects of spatialization. Bartlett points out that while we must turn our bodies to see and process the full 3-D visual field, we more easily process three-dimensional *audio* information.

In concert, Bartlett encourages his audiences to experiment with closing their eyes to intensify the 3-D audio effect. In addition to placing computer-generated sounds anywhere in the 3-D field, Bartlett can project his marimba sound in a similar manner, denying the listener's expectations to "hear what they see" in front of them, and further meshing the marimba and computer sounds.

The heart of Bartlett's system is a computer running software on the Linux platform. His primary performance controller interface is PD (Pure Data). With this and other software, he controls live processing, pre-recorded sounds, and other elements of performance. He is concerned with precision of audio quality, from its high-definition rendering, through high-quality cables, to high-end loudspeakers.

Bartlett plans to make another recording this summer to complete his next recording project, tentatively titled *Powered Flight – music for solo marimba and computer-generated sounds*. The record will include a prelude and postlude of unaccompanied marimba music: "Tender Buttons" and "Alta" by Stephen Dembski. Also, it will include Schindler's "Take Flight" and other new works by Dembski and Wilder.

While his primary goal may be to offer performances with the highest artist merit, Bartlett is establishing himself as a key player in a fundamental paradigm shift for musicians and audiences alike. Listen to Nathaniel Bartlett, and take the advice of word-jazz paradigm shifter Ken Nordine: "Stare with your ears."

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