Tech-Centric Percussion Opportunities: Case Studies in Collaboration

By Kurt Gartner

The following article comprises case studies of the activities of leading figures at the confluence of percussion and technology. These composers and performers all seek to advance and promote the art. Each of these artists shares thoughts about the challenges and advantages of the techno-percussive realm, recent activities, ways to establish collaborative relationships and projects, and suggestions for advancement in the understanding and inclusion of technology-based percussion performance.

ANNIE STEVENS
Collaborative Creativity "Cubed"

Annie Stevens is the Assistant Professor of Percussion in the School of Performing Arts at Virginia Tech where she teaches studio percussion and directs the VT Percussion Ensemble (VTP). As a member of the percussion duo Escape Ten, she maintains an active performance calendar around the United States and abroad, having recently performed with the Escape Ten duo at the 2019 World Association of Symphonic Bands and Ensembles conference (WASBE) in Buñol, Spain, and the 3rd Meeting of Contemporary Percussionists in Xàbia, Spain. Escape Ten, composed of

Stevens and Andrea Venet, performs new repertoire throughout the U.S. and abroad, collectively contributing to the growing repertoire of percussion music by commissioning composers, and publishing these new works under the Escape X Series through Keyboard Percussion Publications. The duo has also performed a showcase concert at PASIC 2016, the Leigh Howard Stevens Summer Marimba Festival, Atlanta's prestigious Spivey Hall, the Barnes Foundation in Philadelphia, Jacksonville's Cummer Museum, as well as numerous universities.

From Stevens' perspective, learning

to use the available technology is both a challenge and an opportunity. At Virginia Tech, she has access to a cutting-edge facility called The Cube, which is a four-story theatre and high-tech laboratory. With over 140 surround speakers, it is a highly flexible space that is well suited to elaborate audio and visual designs and productions. When Stevens first entered this space, she knew that she had to perform in it, whether as soloist or with the percussion ensemble. She has staged several solo and percussion ensemble performances since the venue opened in 2013. While seeking to commission new works that could fully

A performance in The Cube at Virginia Tech. Photo by Susan Sanders.

exploit the capabilities of the space itself, Stevens recognizes that it is a finite universe of composers who have had the opportunity to create 134-channel soundscapes. Consequently, her pursuits and projects continue to move in the direction of that goal. Along the way, she has worked with outside composers as well as faculty colleagues in music and cinema.

One of Stevens' projects that exploits the design of The Cube is "Marimbas Everywhere" by Eric Lyon, who is a professor in the music department at Virginia Tech as well as a recent Guggenheim Fellow. Also, Lyon hosts the annual "Cube Fest," a festival that invites submissions for multi-channel spatial music created for concert presentation. As part of his Guggenheim award, he composed "Marimbas Everywhere" for six marimbas and a computer musician—in this case, Lyon himself. An expert in spatial music, Lyon took advantage of the design of The Cube for this composition. In performance, four of the six marimbas were placed on the catwalks around the space. In addition, he utilized the surround-speaker system extensively, so that the audience was completely surrounded in the sound. Stevens notes, "When you're listening to it, you really can't decipher what is real and what has been processed. In real time, he manipulated sampled marimba figures against what was happening acoustically, each marimba having its live sound captured by a microphone, which is then routed through various spatial algorithms developed by the composer in Max/MSP. For the audience, it's quite a sensation."

In addition to taking advantages of collaborative opportunities within her university, Stevens keeps up with the broader universe of tech-centric works and their composers by following some of the leading record labels in this area. One such label is New Amsterdam Records, a Brooklyn-based not-for-profit artist's service organization that supports "the development, dissemination, presentation, and promotion of new album-based projects." Other examples include Nonesuch Records, Nova Wave Records, and Parma Recordings. Following the social media accounts of these and other entities, Stevens can track many of the composers who are writing notable works for percussion. A member of the PAS Technology Committee, Stevens also points to the database of works for percussion with electronics that is being developed by this committee.

Through PASIC, state chapters' Days of Percussion, publications, and other resources, PAS promotes percussionists and compositions that include technology. For other perspectives, Stevens is also active in other organizations that promote tech-centric music that may also include percussion. One of Stevens' early experiences in this regard was her performance of Da Jeong Choi's "Mons Montes (A Great Rock)" for multi-percussion solo and 2-channel electroacoustic music at the 2011 International Computer Music Conference (ICMC) in Huddersfield, England. By attending that conference, Stevens was exposed to a new world of multi-channel, spatial music and the sort of critical listening that is required to assess such works. Subsequently, she performed at the 2015 National Conference of The Society for Electro-Acoustic Music (SEAMUS), which was hosted by Virginia Tech. In 2018, Virginia Tech hosted the International Conference on New Interfaces for Musical Expression. Stevens reflects that it "was really an incredible conference, because it went beyond a group of academic composers. There were others in attendance with different areas of research expertise. This is where I met Andrew Schloss and learned about the MechDrum™." (*Stevens wrote an article for the March, 2019 edition of Percussive Notes about this unique interface*.)

Stevens' interest in tech-centric music for percussion is influencing her students at Virginia Tech. A key part of her percussion curriculum is a project that she assigns to all students in their junior year. In this project, students compose and perform original works for multi-percussion solo. These works, which are performed on junior recitals or juries, have included increasing elements of technology, although technology is not required. Stevens comments, "Several of my students recently came to me and said, 'Can we have an electronic track accompanying our piece?' I agreed. In the most recent round of these recitals, all five utilized some type of technology. Four of the pieces had audio tracks and one had a visual accompaniment. It was a great project for them because they created their own backing tracks. Some were basic tracks created in GarageBand, while some of them were created by music technology majors using more in-depth software. All the pieces really came across well. These projects allowed them the freedom to explore the technology on their own to create pieces that really spoke to them. I heard no complaints along the way, and the audience really loved the pieces."

BRUNO LETORT
Concrete Music Reimagined

In her own way, Annie Stevens has contributed to the lexicon of tech-centric music for percussion—performing new works and becoming ever more fluent in the historic and stylistic progressions that led to their creation. Another artist, composer Bruno Letort, is keenly aware of new technology and the roots from which it springs. The Cézame Music Agency describes Letort (b. 1963, Vichy, France) as "a prominent figure on the contemporary French music scene. Formally trained in composition and harmony, his work is characterized by a deliberate indifference to stylistic boundaries. His orchestral pieces, his numerous string quartets and a ground-breaking interactive opera are evidence of an open-minded sensibility as much to the American repetitive movement as to Eastern European tradition or ambient and electronic music. He has composed interactive inter-disciplinary works for stage, film, and ballet. An educationalist, artistic director, and writer, he has been

> **"Much of percussion begins from the position of sound or timbre as opposed to pitch. This aligns very well with a lot of electroacoustic music."**
> **—Scott L. Miller**

a producer at France Musique since 1994, where he founded the National Radio label Signature. As producer, he has collaborated with Pierre Henry, Fred Frith, Hector Zazou, Jean-Luc Godard and Elliott Sharp."

As a prolific French composer who embraces the use of technology, Letort is part of the fabric of his country's important and lasting history of technology-based musical innovation. He states, "We have a long tradition in France of working with musique concrète. In 1949, Pierre Schaeffer decided that concrete music is music that you can present on stage. It was really incredible at this time. So, for the French people who are interested in new music today, it's not a new story."

Via French radio, the works of Schaeffer and other composers affiliated with the Groupe de Recherches de Musique Concrète (GRMC) were broadcast to national audiences, including a young Letort. Today, Letort's compositions include elements of classical/acoustic traditions with those of musique concrète. His use of technology dates to his work in the early 1980s with the Yamaha CX5-M, an early example of a computer with an integrated FM synthesizer and MIDI interface. Through time, he began to work with samplers including the Fairlight CMI (Computer Musical Instrument) and Synclavier. He has worked extensively with GRM Tools software, and several years ago, he began working with Max/MSP. To this point in his career, Letort had written extensively for percussion, but primarily in context of orchestral works. Incorporating Max/MSP, Letort wrote his first chamber piece including percussion, "Après le tremblement de terre." In this duet for saxophone and multi-percussion, Letort collaborated with percussionist Philippe Spiesser. Letort used Max/MSP to alter the sounds of the saxophone and percussion (primarily, drums and marimba), creating new timbres out of familiar raw materials. At times, Letort added to the texture of the seven-movement work with his own guitar playing in real time.

In addition to his many commissioning and recording projects, Letort networks with the global community of artists through music conferences and other events, including a recent presentation of his music at a festival in Beijing and the contemporary music festival that Letort hosts in Brussels. Through these contacts, Letort also gains insight into the sensibilities of tech-centric composers and performers from other continents. Letort points out that many organizations exist throughout Europe to promote the creation and performance of works involving technology. Among these are two important French organizations—the aforementioned GRM, and l'Institut de Recherche et Coordination Acoustique/Musique (IRCAM). Since its founding in the mid-1970s by composer Pierre Boulez, IRCAM has been a leading force in technological advances including the development of FM synthesis and Max, instruction in the use of music technology and other subjects, research tools including audiovisual archives, a database of contemporary composers, analysis of IRCAM works, and a multimedia library.

Going forward, Letort recognizes the important connection that live audiences seek between the physical gestures of performers and the resulting sounds. For example, the physical gestures required to press keys on a laptop are nearly indis-cernible for a viewing audience. However, artists such as Philippe Spiesser are researching ways in which further technology may be employed to make new connections between the physical gesture of the performer and the audible music produced. In a sense, Letort ponders, this relationship between performer and electronics have been a consideration since the introduction of the Theremin.

SCOTT L. MILLER AND SEAMUS

Scott L. Miller is a composer who has, where percussion is concerned, a very long collaborative history with the ensemble Zeitgeist, a quartet that includes, among other things, two percussionists. He has an extensive history of creating repertoire for the ensemble and its members who, Miller says, are "fearless in accompanying me on this technological exploration that I find myself participating in every now and then—well, most of the time." Most of the work that he has created for the past twenty years is dependent upon some sort of digital signal processing, computer-based audio or visual element that's integrated into the pieces. Miller reflects, "That's how I ended up working with percussion or percussionists, often in collaborative situations where technology and the exploration of new technologies is the reason we're working together."

At the confluence of his interest in composition, technology, and percussion is his long and active association with the Society for Electro-Acoustic Music in the U.S. (SEAMUS). Miller has served as a conference host, then as Vice President of Programs, as President for four years, and now as Director of Recordings for SEAMUS Records. This work brings Miller into contact with a lot of percussionists every year in many different capacities.

Miller works from the premise that unless one is writing for acapella voice, technology is a component of music making. From this perspective, the relevant

questions include, "What sort of technology is it? And beyond that, how old is it or how reliable is it? How understood is it?" He continues, "For me, it's just pursuing things that are interesting to me or that I find somehow rewarding to spend time with." Indeed, computer-based technology and the electronic manipulation of sound have attracted Miller's interest throughout his creative life. And Miller points out, "I think it's safe to say percussionists have a unique view of the role of technology in their own music making. Certainly, there is a very hands-on experiential element for working with percussion instruments. Regarding multi-percussion setups, you have to think about or maybe experiment with the placement of the instruments in order to get the most musical performance. This is not something that violinists or clarinetists necessarily have to confront every time they're going to put together a piece." Miller recognizes that percussionists have long since existed in a kind of world where they must consider these variables. He points out, "Whether we're talking about different sorts of clamps and stands, or we're talking about different kinds of microphones and signal processing that transforms what they do, I think that that's already a natural fit there. Related to this is this parallel history of percussion and music technology or electro-acoustic music. So much of percussion begins from the position of sound or timbre as opposed to pitch. This aligns very well with an awful lot of electroacoustic music and the historical timing. It works out rather well that when you have actual percussion ensembles or the idea that percussion is something other than a sound effect or an exotic addition to the orchestra, this happens to align with other changes of thought—the idea that maybe musical sounds aren't simply those things made by Western musical instruments. Perhaps musical sounds can be anything that we find in everyday life." Miller notes that the truly avant-garde philosophy of the futurists is that music of the future that will

be composed entirely of the sounds of contemporary life, and that it should somehow be a more accurate representation of the sonic art of that age. Miller says, "All of this fits together in a way that helps explain why percussion and percussionists so often seem to be part of this other thing involving electronic technology."

For performers, it is advantageous to understand the motivations and creative processes of composers. In this regard, Scott L. Miller represents an excellent case study. As a composer, Miller's work often involves improvisation as part of the collaborative process. Consequently, his work is idiosyncratic to specific performers and frequently requires his presence for the performance of his works. On one hand, Miller values this process of music making, as it gives him the opportunity to work and spend time with his collaborators. On the other hand, this approach can make repeat performances difficult—and often expensive. As Miller points out, however, "That's something that's simply important to me as an aspect of my own creative work." Also, Miller has gone to some lengths for the past decade to also create versions of work that can be performed without the need for his presence in performance. Miller acknowledges that these works are less collaborative in their creation, possibly removing improvisation or the possibility for spontaneous decision making. In the end, these versions become more through-composed compositions. Miller states, "I try to have works that fit both performance needs. In the case where I'm creating something that doesn't require my direct participation, I am specific about the outcome expectations and I try to notate things in a traditional way that removes as much uncertainty as possible. It is important to anticipate confusion or concerns that performers might have. If they're going to give you their time, then you should give them as much information and clarity of expectation as possible."

One of his recent projects, "Tipping

Point," involves ecosystemic programming, an approach to treating a performance space as a sonic ecosystem. In this environment, sound that is produced or processed by the computer is responding in simple or complex ways to the behavior of *all* sound in the environment. Using Kyma, he programs individual sound objects to seek a balance of existence. New interest in "auto-destructive art" involves programming ecosystems that eventually collapse under their own lack of balance or willingness to compromise. Miller says, "Many feedback loops of the ensemble's performance data are tracked in terms of amplitude and frequencies. Those data affect the electronic sound produced and sent into the performance space. Ensemble members play in sync with it. This piece is not highly improvisatory, but it does have an open number of sectional repeats where the ensemble can repeat several times depending on the performance situation. The potential for surprise is in terms of how the electronics will respond to what the musicians are doing as an ensemble. Sometimes, there is an immediate and very transparent connection and the musicians understand it. Sometimes it takes about thirty seconds before the results come in from what they're doing. In that moment of the performance, the space, electronics, and musicians create a giant instrument. If you've never heard the piece, it's always new. It can also surprise the performers who've been working on the piece. The piece is called 'Tipping Point' because the programming is set up so that they're constantly pushing the sound towards some certain threshold that will cause the programming to kick over and move into this other sort of state, producing different kinds of music. The music making is about getting to that place. It's about the journey. The musicians have a goal and, in a sense, their performance approach is constrained or informed by that goal." Through the collaborative process, Miller began by presenting sketches to the ensemble, setting up mics and computer, experimenting,

learning the behaviors of the artists and his programming, then taking the project home to modify his computer programming.

A natural path to disseminating Miller's works is SEAMUS, an organization that serves not only composers, but also performers and presenters and educators with an interest in the very broad field of electroacoustic music. Clearly, the membership and mission of SEAMUS overlap with those of the Percussive Arts Society. SEAMUS has an annual conference with a performer-curated concert series. Miller says, "Part of the SEAMUS mission is to bring together the different people who are making music that involves electronics or knowledge about that. Automatically, that includes performance. Percussionists interested in learning about what is even possible, learning about what repertoire exists, meeting people who are making music for percussion and music technology in some capacity, or just meeting people who are interested in it and want to talk about it or pursue some sort of research—SEAMUS offers a growing number of opportunities for percussionists who are interested in any of these things." With Miller's leadership, SEAMUS facilitates collaboration, creation, performance, and dissemination of tech-centric music. As Miller puts it, "I think the best thing that we can do in the organization is enable people to communicate with each other about what they're doing and what they're interested in, and then somehow disseminate what they're doing. And that is where the recording series comes into play. Also, we have established an electronic database of works where member composers can enter information about their music. Then, performers can search the database for music that aligns with their interests. This has been picked up by a couple of other related programs that are scaling it up—work by Tae Hong Park at NYU and Ico Bukvic at Virginia Tech. This is all with the aim of cataloging the music that exists and enabling people who are looking for music

"Some computer musicians tend to be sitting behind whatever technology they're using. When technology is blended with percussion instruments, it can be clearer to the audience because of the relationships between the acoustic and the electronic."
—Louise Devenish

to find something that might be of interest." Miller notes that the role of SEAMUS is to share information about works without exercising a lot of editorial control, stating, "We do anything we can to make access easier without biasing what we offer or creating more obstacles to it, but to just facilitate sharing what exists and what it takes to actually create and perform this kind of music."

In terms of his pedagogical approach at St. Cloud State University, Miller takes an outcome-based approach to technology and composition. Generally, he creates projects that have specific creative outcomes—not necessarily connected to specific aesthetics, but often modeled on extant works. Miller states, "In learning music technology through imitative or original solutions to particular creative challenges that somebody else already solved, it is most effective to have some sort of goal in mind—a product that you're trying to produce or a musical outcome that you can imagine. It might surprise you when you get there, but this approach fosters learning in a way that simply lecturing doesn't quite get." Similarly, Miller finds that his own works are best realized through a shared, collaborative process.

Miller encourages percussionists to seek research and networking opportunities through participation in conferences of SEAMUS and other organizations. Miller says, "International organizations like ICMC, national organizations like SEAMUS, and regional conferences like Electronic Music Midwest do serve composers and may seem to be

concerned with the performance of their works. Nevertheless, these are great opportunities for performers to network with composers and to share what they're doing as performers themselves. And with SEAMUS, for example, there's no reason performers can't submit works of their own." Miller is also conscious of the creative efforts and achievements of musicians outside academia who utilize technology, and he recognizes these artists as an important part of the creative community.

Even in a time of crowded curricula and time restraints, Miller's work as a composer, educator, and leader of SEAMUS have moved music technology more firmly into the canon of composition and performance. He notes, "I think we should regularly admit to ourselves how little time there is. There will always be some gaps in what we can teach. To the extent that we consider technology important to the preparation of our students, we need to then build that into the curriculum. As educators, we tend to treat things as special until finally it is utterly, completely obvious that it's not special. For instance, I remember having to teach my students how to use email so that I could email them assignments. Now, I can simply assume that they understand the process; it requires no explanation. I can also expect my students to make, edit, and submit videos of themselves. Ten years ago, that task would have required weeks of training—introducing them to the equipment, maintaining it, and so on.

"Somehow, some technology hasn't

quite made it into that arena yet. I'm not always sure why that is the case, but honestly, I think it comes back to the repertoire. If we behave like this is normal, then it just is going to be normal. Is it potentially frustrating in a way that the other things are? Sure, of course it is. Suppose you strip a lug or have to a change a head on concert day. Nobody plans for that. But, of course, you do what you have to do. Normalizing a diversity of experiences is ultimately how this is going to change. Think of the iPad being used for music notation, display, and performance. It seems like it happened overnight. It's changing how composers are thinking about laying out their scores, because we can readily create individual scores for each player, in which the player's part was considerably larger than all of the other supporting parts."

CHRISTOPHER BIGGS AND SPLICE

Eclectic composer, multimedia artist, and programmer Christopher Biggs also teaches composition and related technology at Western Michigan University. In his work, he uses Max/MSP extensively as a component of his composition and his teaching. Biggs sees the synergy between practitioners of percussion and technology in terms of "tinkering, openness to sound, and diversity of practice." Biggs notes that "with electronics, like percussion, you have to tinker and invent and play as part of practice unless you're using a more standardized tool—and often, we're not using standardized tools. We're using tools to get a wide variety of outcomes among infinite timbrel possibilities. We have to really 'play,' and I feel like percussionists are much more open to do that regularly than a lot of other musicians. It's similar with the way that percussionists interpret the notation. Musicians on all instruments experiment, but it seems that when a score calls for a piece of wood or a piece of metal, the percussionist wants to hit it and scrape it with all kinds of things—to get a real-time biofeedback of what's

interesting and present those as options very freely. So many of the instruments are not traditionally pitched, so there's an openness to sound that's shared with electronics."

Biggs also point to the diversity of practices in percussion as in electronics. He states, "When you're developing a way of presenting a work with electronics, you can surround yourself with all kinds of electronic instruments and means of getting to those outcomes. And often, percussionists are the most versatile in terms of what they are willing to do, because you're often surrounding yourself with a wide variety of instruments and finding the ideal way to get sounds from them. Percussionists are used to adding tools and adding different ways of engaging them through any kind of gesture, motion, trajectory that causes a sonic outcome."

Biggs is co-founder and director of SPLICE Institute, an annual music technology and performance program that is part of the SPLICE Music organization. Also affiliated with the organization is SPLICE Ensemble, a trio that presents works for instruments and electronics. Additionally, SPLICE Festival is three-day conference that blends live performances with new technologies. Biggs explains, "SPLICE Institute brings together about 50 to 60 participants who are music technologists, performers, and composers. At SPLICE Institute, we teach how to write music very competently using new tools. Participants develop tools to discover new possibilities with music technology, largely from a composer's or a performer's perspective. Also, performers learn how to perform these kinds of works, coordinating Max patches, Pure Data patches, Super Collider, and so on." In addition to learning software, participants learn about the logistics of incorporating a computer into the on-stage performance setup, how to manage hardware such as pedals, and how to work with audio engineers. By pairing performers and composers in the intensive environment of SPLICE In-

stitute, Biggs and his colleagues provide pedagogy that is lacking or missing from the curricula of many colleges and universities. Biggs comments, "SPLICE Institute is about providing a very intensive, direct way of establishing a practice and moving forward. We pair the performers and the composers, premiering about twenty collaborations each year. From the point they're accepted, they're working together in a collaborative process to present a piece to culminate SPLICE Institute." Additionally, Biggs notes that others attend SPLICE Institute not to participate in the presentation of collaborative works, but to attend workshops, which comprise several hours of each day's schedule.

In addition to teaching the skills of incorporating technology into the composition and performance of music, Biggs and his colleagues lead discussions regarding the aesthetics of tech-centric music. One topic that has arisen in these discussions is that of the potential disconnect between the physical gestures of performers of tech-centric music and the perceptions of audiences. Biggs states, "If a person walks out on stage in front of a piano, and it's not a performance art piece, there's a range of things that are likely to happen. The audience members can imagine themselves on stage, making those actions—they get sympathetic neuro-responses. Perhaps they have tinkered with a piano or actually played one. Then, there is a greater part of them that is engaged with that process; they understand how it is happening and why it's impressive. But if you have a performer on a computer or an iPad, the audience has no idea what is happening. The performers could be checking their email! So, you have traditional instruments that are mapped in a physical way that audiences can internalize and appreciate quickly, versus this thing that is infinitely mappable and doesn't necessarily have a direct connection between the action and the outcome. I think this is something that has not been dealt with adequately in the field. We need more

works performed repeatedly, so that audiences can develop an understanding of the music's challenges and aesthetics without it being either pedantic or entirely obscure."

Biggs sees the development of gesture-sensing technologies as an important part of the future of the music. He says, "Think about things like the K-Bow that Keith McMillen did for violin. It gives you all the data, which you can extract and put into any kind of format. It's technology that successfully applies traditional performance technique into multimedia or sound. There is a lot to be gained from capturing gestures of someone playing a marimba, either with computer vision or with sensors that they wear. For example, you can capture just the amplitude and the pitch of the instrument as a data input layer in order to create electronic outcomes."

Other technologies in use include gyroscopes and accelerometers. For Biggs and others, these applications of technology represent a transition in which audiences and the academy will "decouple our privileging of acoustic music and instruments, as we learn more about what is interesting, impressive, and worth watching" in tech-centric composition and performance.

In addition to attending events like SPLICE Institute and belonging to organizations that foster the development of music technology in composition and performance, Biggs urges people to simply do a bit of research in their areas of interest, then reach out to others. Read the documentation, and if you still don't understand something, find somebody who's done it—including prominent artists. Biggs notes that artists are often flattered and excited to share their experiences with others—and the worst they can do is say "no."

ELAINIE LILLIOS
Meta-Instrumental Composer

Elainie Lillios is a composer who specializes in electroacoustic composition. Lillios explains, "What that means for me is that I work with sound in many ways. Some of the music that I compose is for what we now call 'fixed media,' which simply means that it plays through loudspeakers to an audience who may have their eyes closed, or who may be in a darkened room—but there is no performer on the stage. Another avenue of expression for me is collaborative multimedia projects. I work with some visual arts collaborators, and we do abstract animations with electronic music. We also do immersive installation art projects that exhibit in galleries. Perhaps most interesting to your readers is my work with instruments and live electronics. In these works, I have one or more live performers, typically playing what we might consider to be traditional acoustic instruments or percussion, often using extended or non-traditional techniques. Enhancing, or adding to the live performance are fixed media tracks or live electronics, in which the acoustic instrument is the vehicle for producing the electronics."

For a composer to whom the most important aspect of music is the timbre—as she puts it, "the sound of the sound"—her attraction to the realm of percussion is natural. Lillios says, "I find that percussionists have such an amazing openness

Setup for "Immeasurable Distance" by Elainie Lillios at Bowling Green State University, Bowling Green, Ohio (2019)

to experimentalism, to exploring sounds, to finding that instrument, that mallet, or that gadget that's going to produce just the right sound. That is the thing that gets me the most excited about working with percussionists. I think I now have more percussion pieces with live electronics than I have for any other instrument."

A great example of Lillios' collaborative process with percussionists is her work with Scott Deal. Lillios became familiar with his performances through SEAMUS, where he, in turn, became familiar with her compositions. Their first two collaborations were "After Long Drought" and "The Rush of the Brook Stills the Mind." Recently, Lillios and Deal completed their third collaborative project, a piece called "Immeasurable Distance." She composed this piece in memory of her former Bowling Green State University colleague Roger Schupp, who passed away in 2015. Originally, Schupp had asked composers including Lillios to write pieces for him, using instruments that could fit into a suitcase. Sadly, Schupp passed away before Lillios was able to pursue the project. After some discussions with Deal, Lillios decided to pursue the compositional concept. Since Lillios had not had the opportunity to learn from Schupp what would go into the suitcase, she spent an entire day at Deal's home studio, considering the possibilities. Lillios reflects, "We came to a place where we started experimenting with resonant metals—some Zil Bels, some tam tams, some cymbals, and various types of bells, including some camel bells. After we decided on the instruments that would be part of this array for the piece, we started to experiment with the implements—everything from yarn mallets to steel pan mallets, bows, knitting needles, chopsticks, and BBs."

Lillios returned home, reviewed the images and videos of her improvisations with Deal, then continued the dialogue and exchange of ideas and recordings. She began to compose based on those improvisations, using Deal's acoustic

recordings to guide her development of the electronic elements of the piece. Throughout the process, Lillios kept in mind the absence of her valued colleague, Roger Schupp. It was this sentiment that inspired the title of the work.

Asked about organizations helpful to composers and performers in addition to SPLICE and SEAMUS, Lillios points to ICMC, Electronic Music Midwest, and other organizations and events cited by other artists included in this article. For readers who are interested in connecting with the Canadians, Lillios also points to the Canadian Electroacoustic Community (CEC). Additionally, she recommends the New York City Electronic Music Festival, and the Third Practice Festival in Richmond, Virginia. Looking into electronic music festivals is a deep rabbit hole, as Lillios explains, but it's merely a reflection of the growing number of quality opportunities for composers and performers.

In addition to seeking connections and information through organizations and their events, Lillios also encourages local interpersonal networking. She points out, "Not all, but many academic institutions have some sort of electronic music or music technology area. And even in small programs, someone knows someone who can make a connection.

Talk to your friends who are composers. Get them to write pieces for you. Talk to professors; they might know composers who might have music or be willing to collaborate. And another way to find some of these resources is through online searches." She notes that web searches reveal grassroots efforts of individuals—including percussionists—to create and share lists of compositions. And even if web searches may represent the "Wild West" of research, Lillios adds, "The Wild West could be an interesting place to be!" In a brief web search, Lillios came across the websites developed by a former student of hers, who happens to be a percussionist. Under the umbrella of Score Follower, the entities Score Follower, incipitsify, and Mediated Scores are all YouTube channels with videos of legally obtained scores and recordings. In the videos, score pages turn synchronously with the recordings.

Lillios strongly favors composing for specific performers, considering seriously their skills and abilities. She remarks, "I prefer working collaboratively with performers—learning what kinds of techniques they enjoy playing, finding out what kind of piece they want, and also learning where their virtuosity lies. It's important to me that the piece focus firstly on the performer. The electron-

Scott Deal performing "After Long Drought" by Elainie Lillios for vibraphone and live electronics at Electronic Music Midwest 2018, Lewis University, Romeoville, Illinois

ics' role is to expand the sound of the acoustic instrument, creating a 'meta instrument' of sorts, and also creating an immersive environment. Perhaps an environmental sound helps to fill the frequency space or the physical performance space. I don't want there to be a disconnect with the audience. I want the audience to see that the vibraphonist is striking a key. You hear an acoustically produced sound, and then there is some sort of electroacoustic response—whether it's an intricate delay line or some sort of granular texture, or some combination of things. The connection is not always one-to-one, because that would become tiresome, but the focus really is on that performer and that they are producing the sound."

Regarding the pedagogy of music technology for percussionists, Lillios recognizes the attributes and challenges of most percussionists. The attributes include a strong work ethic and the flexibility to adapt quickly to changing arrays of instruments and notation. Therein also lies the challenge—the time pressure on percussionists to learn new instruments and associated techniques, and the physical process of moving, arranging, and practicing new setups. Lillios advises, "From a pedagogical perspective, percussionists who are able should take an electronic music class. Percussionists take my classes at Bowling Green State University, and I think that they find it beneficial to gain some facility with the media on its own terms. Apart from having to set up tech for a concert, you learn about sound and how sound propagates in space—you learn all the various aspects of technology. Maybe you make some of your own pieces. It just depends on the class. If you can't do that, there might be an opportunity for professors to make a connection with the recording engineer or the composer who teaches electronic music at the university to do some workshops with the students—Music Technology 101 for percussionists."

LOUISE DEVENISH
New Performance Practices

Percussionist/artistic researcher Louise Devenish is a prolific performer and champion of new music, having commissioned over fifty works for percussion. Devenish is a core artist with acclaimed electroacoustic sextet Decibel, Australia's leading percussion group Speak Percussion, theatre percussion project The Sound Collectors, and chamber ensemble Intercurrent. Currently, she serves as Senior Research Fellow (ARC DECRA Fellow) and Percussion Coordinator at Monash University in Melbourne, Australia. Her solo work and the chamber groups with whom she performs blend acoustic and electronic instruments and performance practices.

Devenish enjoys the collaborative process of realizing new works. She explains, "One of the reasons why I enjoy collaborating and making new music as a key part of what I do as a musician is because of the ability to create new performance practices—new techniques—in the process of making new music or vice versa—for example, with Decibel, directed by Cat Hope. In this sextet, all the music that we make exists at the nexus of acoustic and electronic instruments and techniques. Every work that we develop,

which is usually in collaboration with composers, requires some degree of experimenting to execute the ideas of the composer or the computer musician. Sometimes, those experiments are relative to notation. We have an iPad application called the Decibel that we use regularly. We have developed this application for scrolling, slide, or talking-board formats of digital and animated notation, and we can build electronic parts into the scores in the ScorePlayer."

Recently, Devenish was in the studio, recording a work that came from a solo show "Sheets of Sound," which she performed in 2019. The show comprised three new works for percussion and electronics. The impetus of that performance, as she puts it, "was to create works that deliberately push the percussive art form forward through experimentation with microphones, speakers, and their placement to produce feedback as a percussion instrument." In one work by Annie Hui-Hsin Hsieh, "Permeating Through the Pores of Shifting Planes," the experiment includes placement of layers of acoustic materials like sheets of paper, acetate, or metal between the microphone and the speakers, creating a new range of sounds upon which to draw. Devenish adds, "It's been fascinating setting

Louise Devenish performing "Sheets of Sound." Photo by Nik Babic.

up these speakers and microphones and learning how to perform them musically when it's improvised while also trying to be true to a score. So much of what we do in percussion is about trying to find and make new sounds, and finding new ways of connecting with the people that we're sharing this music with. I find it very interesting, because it's allowing me to better understand how to work with speakers and microphones as a percussion instrument. And it's quite satisfying, once you get the levels right—you can be quite musical with this equipment, even though you're not physically touching anything."

Asked about the aesthetics of tech-centric music and the connection between a percussionist's physical gestures and audience perception or reaction, Devenish has not found this to be a problem in the music she performs. She comments, "I imagine that I would probably answer it differently than a computer musician. Percussion instruments are my tools; that's what I use all the time. Whenever I'm using foot switches, MIDI keyboards, or devices like Ableton Push, they're never the main part of the setup. For me, the electronic instruments are there to support a 'quest for sound,' if you like. A MIDI keyboard is not included in order to use a MIDI keyboard; it's there in order to execute a sound that the composer or I have been looking for. I've never really had to play anything where I'm restricted behind a desk or a computer only; I've always had percussion instruments in the mix as well. So, it's possible to be quite clear gesturally when you're activating something that triggers something else.

"An example might be 'Catacomb Body Double,' another work from Sheets of Sound by composer and fellow percussionist Matthias Schack-Arnott. This particular work used MIDI triggers to activate some transducers that were used to transform an ordinary bass drum into a vibrating body. In this case, the bass drum wasn't the instrument, it became an activation surface, used to elicit trem-

ors and vibrations from other percussion instruments. There was a very clear physical and visual relationship. When I activate the foot switch that turns that transducer on, you can see the bass drum vibrate, and the audience can understand what is happening. There's always some kind of connection between the technology and its response in this live situation."

A computer musician is present in many of the ensemble works that Devenish performs, and she recognizes that the role of that musician is different when on stage. She notes, "Some computer musicians do tend to be sitting behind whatever technology they're using, and it's less obvious to the untrained observer exactly what they're doing. When technology is blended with percussion instruments, it can be clearer to the audience because of the relationships between the acoustic and the electronic."

Like other artists featured in this article, Devenish recognizes the similarities between percussion and electronic music, as musicians in these realms tend to prioritize different elements of music in comparison with more traditional classical Western art music. She states, "Classical Western art music will often prioritize pitch and rhythm above other things like texture or timbre or dynamics. Percussion and electronic music flip that around—we often prioritize texture and timbre and dynamic more than harmony, pitch, or rhythm. That's why I think there are a lot of really interesting things to explore when we bring percussion and electronics together. There are definite advantages; we're coming at similar concepts, but from different angles. Also, it throws up some challenges when a composer might be requesting something from one perspective. Sometimes, it can take a while to understand exactly what they're asking for if you're coming at it from a different angle."

Electronics represent another extension in the ever-broadening palette of musical tools available to the percussionist. Collaborating with composers

who are fluent in the technology is an excellent way to expand that palette thoughtfully. For Devenish, it's the primary means of working on new pieces. She says, "Everything I do involves a collaboration of some kind—usually with a composer. Every collaboration is quite different, depending on the context. I suppose I'm most active when I'm developing new solo projects. At the time of developing that work ["Permeating Through the Pores of Shifting Planes"], Annie Hui-Hsin Hsieh and I were living in different hemispheres. That collaborative process took place on the internet. We'd have a lot of Skype conversations, sharing of videos, and listening to my previous works. She's a fantastic composer to work with because when you commission a work from Annie, she really investigates the performer and writes to the performer's interests and strengths. She created a graphic score for this piece, because I work a lot in graphic notation, particularly with Decibel. In the final stages of developing the work, she came to Perth for an intensive residency. At that point, the collaborative process moved between discussions of notation and performance practices again, and also executing a lot of different sounds.

"I was responsible for suggesting the instrumentation and getting that made," Devenish continues, "so I commissioned a set of eight bell plates, which became the primary instrument that Annie used. It was really quite a collaborative experience once we were in the residency together. But it was an interesting process, because so much of it happened online beforehand. When you have a collapsed duration like that, the future performances of the work become really important, because when we're physically in the same space, we're able to revisit together how to further refine the work."

The substantial creative output of Louise Devenish is clear evidence that establishing relationships with composers and launching collaborations is worth the ef-

fort. She reflects, "I wish I knew a really great way to make instant connections with people to recommend. There are so many composers around the world that I don't personally know, but I would absolutely love to work with. Most of the people who I work with, I've met in person at a festival or a conference or some kind of event. We've got on and found we like each other's music or each other's aesthetic. As you're getting to know someone, it takes a year or two before the right project rolls around to collaborate with someone new. Generally, it's through direct personal contact rather than just writing to someone out of nowhere. I'm not very good at the cold call. Mostly it grows out of friendship, which I find to be a really comfortable way to collaborate—when you know someone as a person. It takes away any kind of doubt or worries about the collaboration when you're working with someone you already know and trust. I find that this rarely leads to just one work that we will do together. It becomes a longer-term collaboration."

Among the conferences and festivals she attends, Devenish recommends the International Conference on Technologies for Music Notation and Representation (TENOR). In 2019, the conference was held at Monash University, where Devenish was an artist in residence with Decibel. Devenish describes the conference saying, "TENOR is a conference about notation—particularly, digital notation. There were so many fantastic composers there, and if you're at a conference like that as an artist in residence, you end up working with a lot of composers and performing the works that they have submitted. I find that really enjoyable and exciting—you find some great music and learn a lot by doing that."

Devenish also points to an Australian counterpart to ICMC, the Australasian Computer Music Association. "Similarly," she says, "I've met composers through being asked to play their works. Conferences have been really interesting and fruitful places for me,

also in terms of hearing new music, and seeing how other people were working with percussion and electronic pieces."

With its increasing pervasiveness in all aspects of modern life, Devenish sees technology as having greater importance in percussion performance. As a teacher, she strives to balance a crowded curriculum to include technology in the creative activities of her students, also aware that each generation of students comes to formal music study with a new understanding of technology, often using it on their own before beginning formal studies. However, Devenish is not interested in technology for technology's sake, but for advancement of music and enhancement of audience experience. She says, "I can see percussion as an art form continuing to develop, moving towards what I'm now referring to as 'post-instrumental practice,' but I'm not sure about that term. Come back to me in twelve months! As the post-instrumental practice continues to develop, technology will become a bigger factor. That's also linked to how we're presenting performances. The concert as we used to know is really not as common in percussion performance or new music generally, anymore. Things are becoming more immersive. There are more influences from installation and other performing art, and I think technology is really facilitating and should be embraced."

LINKS

Australasian Computer Music Association: *https://computermusic.org.au*

Canadian Electroacoustic Community: *https://cec.sonus.ca*

Christopher Biggs: *https://christopherbiggsmusic.com*

Da Jeong Choi: *www.dajeongchoi.com*

Decibel ScorePlayer: *www.decibelnewmusic.com/decibel-scoreplayer.html*

Elainie Lillios: *http://elillios.com*

Electronic Music Midwest: *http://www.emmfestival.org*

Eric Lyon: *www.performingarts.vt.edu/faculty-staff/view/eric-lyon*

Escape X Series: *www.mostlymarimba.com/books-a-recordings/music-books.html?page=shop.browse&category_id=2239*

Groupe de Recherches de Musique Concrète: *https://inagrm.com/en*

International Computer Music Conference: *http://computermusic.org* *https://www.nime.org*

International Conference on Technologies for Music Notation and Representation: International Conference on New Interfaces for Musical Expression: *https://www.tenor-conference.org*

Keith McMillen: *www.keithmcmillen.com/about-us/who-is-keith/*

l'Institut de Recherche et Coordination Acoustique/Musique: *https://www.ircam.fr*

Louise Devenish: *https://www.louisedevenish.com.au*

Max/MSP: *https://cycling74.com/products/max*

MechDrum: *https://mechdrum.wordpress.com*

New Amsterdam Records: *www.newamrecords.com*

New York City Electronic Music Festival: *https://nycemf.org*

Nonesuch Records: *www.nonesuch.com*

Nova Wave Records: *www.novawaverecords.com*

Parma Recordings: *www.parmarecordings.com*

Pure Data: *http://puredata.info*

Score Follower: *https://scorefollower.com*

Society for Electro-Acoustic Music: *https://seamusonline.org*

SPLICE Institute: *https://splicemusic.org*

Super Collider: *https://supercollider.github.io*

The Cube: *https://icat.vt.edu/content/icat_vt_edu/en/studios.html*

Third Practice Festival: *http://thirdpractice.org/3p19/index.html*

Kurt Gartner serves as Professor of Music and Associate Director of the School of Music, Theatre, and Dance at Kansas State University. He is Technology Editor for *Percussive Notes*.

THE CONCERT BLACK SERIES MARIMBA

The **Majestic Concert Black Series 5.0 Octave** was crafted with professional features to satisfy artists of every skill level. The stunning black resonators are tunable in the low end, offering unparalleled levels of control and expression for a rich tone that can seamlessly blend with an ensemble or boldy express an artist's distinctive voice.

ELEVATED IN EVERY WAY.
EXCEPT PRICE.

INTEGRATED BAR GEOMETRY
BLACK FINISH ALUMINUM RESONATORS
FREE-FLOATING BAR POSTS
AVAILABLE WITH ROSEWOOD OR PADAUK
HEIGHT-ADJUSTABLE FRAME

majesticpercussion.com