Can we align our research and shared values to improve accessibility?

By Nathan Wolek and Andy Slater

Introduction

Accessibility is a term from disability studies that describes the process of removing barriers to full participation (Fritsch 2016). In 2018, Emma Frid published a systematic survey of accessible digital music instrument research that had been presented at NIME, SMC, and ICMC conferences. (See also Frid's article in the present issue of ICMA Array [Frid 2021]). The overall number of publications in each year was small, but she also noted, "Little research in the community appears to have focused on developing musical interfaces specifically for persons who are blind." (Frid 2018) After reviewing the title and abstracts from all proceedings available for these organizations, she reported that "only one paper mentioned persons with visual impairment as target user group". Let that sink in: one paper in over 40 years of conference proceedings.

If we are serious about improving this organization's overall record on inclusion, we must not overlook accessibility in that discussion. And while we acknowledge visual impairment is only one part of the larger discussion on accessibility, it is the one that the current authors (one sighted and one blind) can speak about from direct experience. One paper in over 40 years of conference proceedings is a symptom of broader issues we must face. The vast majority of the tools we use in computer music rely heavily on visual feedback. Such interfaces present barriers to blind and visually impaired creators. The biggest problem is that we expect creators to rely on their vision to do sound work.

The "Young Sound Seekers" project

The two authors of this paper met because of Young Sound Seekers (Atlantic Center for the Arts 2020), a program designed to provide experiences with the natural soundscape and field recording for blind and partially-sighted youth. The project was developed with financial support and logistical cooperation from the United States' National Park Service, which addresses issues of soundscape quality through their

Natural Sounds and Night Skies Division (National Park Service, n.d.). Students from age 13 to 25 visit the Canaveral National Seashore once a month for lessons and activities designed to enhance their appreciation of the natural environment and its soundscape. The park contains 24 miles (38.5 kilometers) of undeveloped shoreline and a large tidal estuary, all with far fewer people than most Florida beaches. Whether we are learning to listen without distractions, documenting sounds with small field recorders, or using hydrophones to hear beneath the waves, the Canaveral National Seashore provides us with an excellent outdoor classroom. There are plenty of animals using acoustic communication, like the osprey circling in the sky, cicadas in the various trees, and dolphins in the lagoon. It provides an exciting location to enjoy and explore the natural soundscape.

Our lessons have drawn on so much of the rich vocabulary that we commonly use as sound artists and computer musicians to describe sounds with better precision. We use the word "soundscape" to designate a "sonic environment", a word first introduced by R Murray Schafer (1977). We use the words "biophony", "geophony", and "anthropophony" to distinguish between major categories of the soundscape, words that were developed in the writings of Bernie Krause (2012). We teach the students about different ways of listening, borrowing ideas and vocabulary from Pierre Schaeffer (2004) and Michel Chion (1994). It has been a joy to experience the excitement some of them display as they connect with a word that perfectly conveys the thing they have always noticed, but never knew how to describe.

Recognizing the barriers

But while our vocabulary has been empowering, our software and hardware tools present many challenges. While designing lessons for blind and partially sighted students, it has been critically important to always have accessibility front and center. That means extensive testing and planning before presentations with our students, as well as consulting with blind sound artists about the accessibility of specific recorders and software. Teaching visually impaired students about

field recording and audio editing has brought the impact of current interface design trends into sharp focus. The small touch screen on a recording device can open a deep set of options for sighted users, but it presents a large barrier for blind sound recordists. By contrast, physical knobs and buttons on a mixing console or hardware synthesizer create an interface that is tactile and can be memorized by visually impaired sound artists. Additional barriers result from the virtual counterparts to these knobs and buttons found on many graphical user interfaces [GUIs]. Complex GUIs prevent independent work by blind creators if they are not connected to keystrokes, screen readers, or voice commands.

There is an uneven track record on accessible tools for sound. For years, digital audio workstations [DAWs] like Pro Tools and Reaper have been accessible for blind creators. A community of dedicated users has created screen reader compatible macros that make it quite simple to record, mix, and compose using these programs (Halatyn 2014; Teh 2021). More recently, digital field recording has become accessible through the creation of smartphone recording apps that connect with companion microphones. The best of these apps (Shure Inc. 2021) integrate screen readers and voice commands so that blind creators no longer have to engage with the minuscule displays and menus that have frustrated them for years. In contrast, the opportunities to use more specialized plug-ins and software for sound design and spatial audio are unfortunately still limited. When an application is designed to be engaged with visually (e.g., 360-panners, point-and-click patching, drag-and-drop actions, and other common GUI features), the assistive technology used by blind creators is never compatible. These accessibility boundaries make it hard for a blind creator to work autonomously and on their own terms. As we look ahead to more immersive forms of content like XR (virtual reality, augmented reality, and mixed reality), the tools for creation seem to be getting more visual, not less, and this is why there are only a few blind artists creating work for XR. There is certainly interest in creating more immersive audio content, but the lack of accessible tools presents barriers to entry.

Defining our responsibilities

ICMA is an organization that supports and encourages the development of hardware and software tools through its annual call for papers presented at an international conference. We share knowledge on the latest developments through the process of peer review and public presentation, and even archive those papers as a record of the innovation happening in computer music. That record has the power to influence future work for both academic and commercial developers going forward. Therefore, we have a collective responsibility to improve our record of developing tools that are accessible and inclusive. If we want things to improve, it will require us to align our research and shared values.

What actions can we take? Should accessibility factor into the peer review process? The current authors would answer yes. While we acknowledge the work that goes into publishing a paper is already significant, without each ICMA member taking on part of the work, we cannot hope to see our present situation improve. Our modest proposal is that authors seeking to publish about software or hardware projects through ICMC should be required to address the issue of accessibility explicitly in their paper. At minimum, authors who are truly unable or not sure how to address accessibility could include a simple call for collaboration with blind creators and researchers aimed at improving the project. This could be augmented with some honest self-reflection in either the Discussion or Future Work sections of the paper. Ideally, authors would document the ways that they thought about accessibility throughout the development process and made adjustments to improve the overall design of the final product. Exemplary development of inclusive tools would include consultation during beta testing with blind creators who are compensated for their time and feedback. Reading about the development of a project like the Haptic Wave (Tanaka and Parkinson 2016), which was specifically designed for blind audio producers, can provide more general lessons about how to address accessibility throughout the development process. And when we fail at accessibility, authors need to document that as well so that others

can learn from their missteps. These small additions to the work we already do can promote impactful conversations to about best practices.

We firmly believe creators should not have to rely on their vision to do sound work. The ocular-centrist tendencies embedded in the pedagogy of computer music and its related industries are by far the greatest cause of excluding blind creators from its own ecosystem. If the technology continues to grow without a set of accessibility best practices, blind creators will be left uninvited to explore and experiment alongside sighted creators. Their natural expertise and unique perspective of sound is excluded from shaping the future of computer music. Inclusion of blind creators begins with the software and hardware tools we design, so let's get started designing better tools.

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