Preface: Experiencing Music Technology

Williams & Webster

[Revised 4th Edition Draft NOT FOR DISTRIBUTION]

> "Technology has altered the way music sounds, how it's composed, and how we experience it. It has flooded the world with music. The world is awash with (mostly) recorded sounds. We used to have to pay for music or make it ourselves; playing, hearing, and experiencing it was exceptional, a rare and special experience. Now hearing it is ubiquitous, and silence is the rarity that we pay for and savor."
>
> —David Bryne, *How Music Works* (2012, p. 143)

Welcome to the **fourth edition** of *Experiencing Music Technology!* If you are familiar with the earlier versions of this textbook, we hope you will appreciate the changes herein and find this version as useful as the last. If you are a new reader, we hope you will enjoy this overview of music technology and its role in the contemporary music scene.

Writing about this field is exciting. Many times since the last edition, we have stopped the process of reviewing and testing new software and hardware on our laptops or mobile devices, remarking to each other how truly amazing the field's achievements have been since our last edition. In 1993, when we first decided to create this textbook, we were motivated in large part by the power of music technology to enhance the experience of musicians of all ages and experience levels. As researchers, educators, and musicians, we saw the role of music technology as a major force in teaching the technical aspects of music and, perhaps most importantly, encouraging the creative experience of music composition, improvisation, performance, and music listening. More than 24 years later, we believe this more than ever before.

Of course, updating such a book presents us with one obvious challenge: the persistence of change. Developments in hardware, software, modes of delivery, ways to create, and even the very culture of music technology itself seem to escalate exponentially and challenge even Moore's Law that technology doubles in its power and potential every 18 months.

Our task is made easier because of the approach we have taken since the first edition in 1996. In each edition since, we have concentrated less on the specifics of each software program or piece of hardware and devoted most of our space to what to expect in, for example, hardware for sound production or notation and sequencing programs. We have referred to selected products that are as current as possible, but we do so with the idea that the specifics are of less importance than an overall understanding of how the technology functions. This approach continues in the fourth edition.

What also keeps the book current is our attention to the future. In the third edition, for example, we anticipated the growth of web-based resources and software as a resource for teaching and for music productivity as well the emerging potential of social networking tools for music sharing, collaboration, and teaching. Our design for categorizing computer-aided instruction continues to be valid and useful for bringing order to this important part of music technology. Certainly the tendency for digital audio to be used more pervasively as part of most music software has been carried to levels beyond our expectations from the earlier dependency on MIDI. Predicted advances in streaming of digital audio and video, computer networking and connectivity, and other hardware and conceptual content have come to pass in the last six years. In this edition, we continue to chronicle what is clearly on the horizon for the near term with glimpses into the future as best as our partly-cloudy crystal ball can provide.

Important Changes in the Music Technology Landscape

So what has changed? Here are a few of the important developments since the third edition:

- The explosion of "cloud computing" permits not only storing and sharing computer documents and digital music creations anywhere over the Internet but offers music software applications (web-based applications) that are accessible from the Internet in their most recent versions without installing them on a personal computer or mobile device. Emerging from this trend is a new, web-based operating system, Chrome OS, and a dedicated web-based Chromebook laptop.
- Social computing has exploded since the previous edition with sharing and social networking available not just from Facebook, YouTube, Flickr, and others, but from music networking applications such as SoundCloud and Spotify as notable examples.
- Our dependence on desktop computers and labs for school settings in the early editions of the book has now given way to very powerful and thin laptops while, at the same time, these are being challenged by sophisticated smartphones and tablet computers like the iPhone and iPad as well as many Android options. With the trend to handhelds, the term "apps" has entered our vocabulary and "music apps" are serious contenders for our hardware.
- MusicXML, which was presented as a research effort in the first edition, has now arrived as the common file format for sharing music notation and is now ubiquitous in music reading, scanning, and notation software as well as handheld music apps.
- Paper-based sheet music, documents, and books are giving way to ebooks and electronic documents—PDF files have moved from a convenience to a necessity.
- Wireless access is pervasive throughout our communities, schools, and homes from WiFi to cellular to Bluetooth connectivity.

More what-you-hear-is-what-you-get music (WYHWYG) software offers the music novice an opportunity to create and share their musical imaginations without first learning to read music notation or play a traditional music instrument. With continued improvements in the human engineering of software it is even easier for the computer novice to use software as more of the technical aspects of music technology are hidden below the surface.

So, What's New With the Fourth Edition?

Since our last writing, we have been pleased to hear from many students and instructors who have used the book. Our research shows that the book is among the most widely used in introductory college and university courses and this positive response has been most gratifying. We also find the book used in many other settings such as public schools and community colleges and for self-study. Given this historical record, how best might the fourth edition be redesigned? Here are three fundamental considerations that drove our work:

Creative, Entrepreneurial, and Community-based Work. In the third edition, we incorporated many changes and these continue in the fourth edition. For example, we continue our emphasis on music and people. This is especially important today because we have observed so many of our undergraduate music students interested in creative, entrepreneurial, and community-based work with musical experiences. Most of these efforts are fundamentally enhanced by technology, both in terms of the music made and activities that support the work. Many of the new projects that we highlight in the chapters that follow are directed toward this contemporary need, including an entirely new Viewport on video tools essential to presentations, social networking, and performance productions

Desktop & Laptop, Web, and Mobile Realities. This fourth edition is designed to recognize a new hardware reality. Music is made by people engaged with hardware of all types. The more traditional way of using the desktop computers for high-end music production work, often in specialized studios, continues; however more portable and flexible hardware solutions are everywhere. Smaller and very powerful laptop computers and hand-held and wearable devices host many versions of music software either locally or cloud-based. The book is newly designed to support this reality with software and hardware alternatives offered for workstation-, web-, and mobile- or handheld-based solutions.

Competencies. Since the publication of the last edition, the authors have been engaged in a four-year project that has surveyed college music instructors in all fields of music in North America about what undergraduate music-technology competencies really matter. Our surveys have validated the critical need for competency in using notation software; understanding digital audio concepts, basic techniques for digital recording, and creating a CD or streaming audio file; configuring a basic music workstation; using presentation software; basic video editing; and understanding copyright and intellectual property rights related to music. This work is now integrated into this fourth edition and is matched with many of the standards of learning that professional organizations require. Each Viewport will include suggested projects keyed to these technology competencies for undergraduate music majors.

Other Important Changes. In addition, here are a few other specifics:

- Focus on a more select set of software in each Viewport, software that is the most cost-effective solution for group instruction as well as self-study. The music software in each Viewport will include discussions and screenshots from personal computer, web-based, and

handheld music applications.

- Change in the organization of the book with the MIDI Viewport moved earlier to permit an orderly progression of topics on digital audio and multi-track recording.
- Creation of new web-based materials organized under "Webports" for each Viewport: to include links to additional software and hardware examples, links to free, third-party tutorials and YouTube videos available on the Web and relevant to each section, and fast-changing updates on technology presented in the printed text.
- Placement of project ideas of all sorts at the end of each Viewport that supports the competencies we have identified through our survey research.
- The majority of screen shots have been completely redone to reflect the inevitable changes in software and hardware development since the previous edition.
- We have included new software titles and deleted others, based on our understanding of the changing scenes in music production and in music instruction software for workstation, web-based, and mobile solutions.
- When appropriate, we have reflected the changes in major operating systems, including the development of Microsoft's Windows environment, the new versions of OS X for Macintosh, and the recent prominence of Chrome OS and Chromebooks. Android and iOS operating systems are added for handheld applications.
- All of the hardware and key concepts have been reviewed, updated where needed, and new technologies and products replaced or added to reflect the current computer and computer music scene.

What is Disappearing? Some technologies heavily emphasized in previous editions are

disappearing off the radar and soon to become extinct. Examples include:

- Floppy and ZIP drives and disks
- CD-ROMs and CD-ROM multimedia, especially, we are sad to say, the incredible wealth of music CD-ROM multimedia titles that began with such titles as the Beethoven 5th Symphony CD by Robert Winter and Microsoft's Music Instruments CD.
- CD-Audio discs are still popular but being severely challenged by downloadable digital music and streaming audio music. Can DVD movies be far behind?
- School computer labs as we know them. With the preponderance of thin laptops and tablet computers in the hands of most students combined with economic pressures to make the best use of resources dedicated computers labs are disappearing on computer campuses.
- Tape-based music recorders, analog or digital tape, have given way to digital recorders with either flash memory or SD memory cards, a direct-to-the-cloud solutions such as SoundCloud, and even using one's smartphone to serve as a handheld digital recorder.

Book Content and Goals

Experiencing Music Technology, **4th Edition**, covers the essential topics a musician should consider when exploring the use of computers and technology in the many aspects of the music experience: listening, performing, composing, teaching, and managing. Unlike many other music technology books written in past years, EMT is designed as an introductory resource and reference guide for a wide audience both inside and outside the academic setting. Although it is

introductory in scope, it still provides considerable depth of coverage on critical music-technology topics.

Modular in design, the book's resources can be used in many ways. Although intended as the text for a complete undergraduate or graduate course of study devoted to music technology, it can also serve as a supplemental resource for other courses in the curriculum: general musicianship, piano pedagogy, theory and aural skills, arranging and orchestration, music composition and improvisation, instructional design, and other contemporary topics. We hope this will meet the need of the newer trends in curriculum design to integrate technology understanding into specific courses and to serve the needs of more modular course design.

In addition, the book can be easily read and used for self-study by people who are simply curious about and intrigued by the use of computers for music making. Professional musicians, parents, children, computer aficionados, and lay musicians of all kinds may find the book helpful in increasing their understanding of music technology.

Experiencing Music Technology is designed to meet the following goals:

- Provide a conceptual overview of music and technology with essential study and reference material
- Give a broad perspective of the many ways people can use technology in music applications
- Offer modular organization of the material to provide flexibility for the reader and the instructor
- Note historic milestones in music computing and technology
- Promote a systems approach to computer understanding, planning, and implementation by stressing five components: people, procedures, data, software, and hardware
- Emphasize hardware and software unique to music applications

- Focus on the conceptual and cross-application features that define current commercial hardware and software
- Avoid featuring industry-specific products for their own sake, instead emphasizing features in common or contrast with other products to illustrate their general application to music experiences.

Experiencing Music Technology Online Support Website

Online *Webports* are available from the Oxford support site to provide many resources to parallel the book material. While the textbook illustrates concepts of music technology with a select range of the most cost-effective software examples, the *Webports* provide links to (a) video introductions of each Viewport with the authors, (b) additional software and hardware examples for the concepts in each Viewport, (c) exceptional web-based tutorials available from sites on the Web relevant to each Viewport as well as YouTube videos, and (d) fast-changing updates on software, hardware, and technology concepts presented in the printed text. All of the materials can be easily viewed through a web browser and located using the Webport links provided in the margins.

Icons in the Margin of the Book

To help you as you progress through each chapter, we have created several icons that will alert you to different levels of help. Watch for these icons:

[NB. Art work for icons need to be inserted for each of these]

- LINKS to helpful information related to this topic elsewhere in the book
- TIPS that are especially helpful to those just starting to use computers and music technology
- ASIDES that are interesting notes for reading enjoyment and mind expansion

- WEBPORTS that reference materials available online related to news, optional software and hardware, and third-party web-based tutorials

So Welcome!

So welcome to this fourth edition of Experiencing Music Technology. Enjoy the ever-changing landscape of what it means to include technology into the profound art form of music.

David Brian Williams, Normal, Illinois

Peter Richard Webster, Marina del Rey, California

About the Authors

David Brian Williams and Peter Richard Webster have partnered for more than 25 years providing leadership to the music profession in technology applications; workshops on the integration of technology to music and music education; and presentations for state, national, and international conferences, including NAfME, CMS, ATMI, and NASM.

David Brian Williams is Emeritus Professor of Music and Arts Technology at Illinois State University. Dr. Williams founded one of the first nationally recognized integrated arts technology programs and served a four-year appointment as Associate Vice President for Information Technology on his campus. He is currently a consultant on computer and music technology (www.coach4technology.net), provides leadership for the Music Technology Leadership Academy project (www.musiccreativity.org), and is active as a composer and instrumentalist in community organizations. In the late 1970s, he cofounded Micro Music, Inc., and developed numerous music-education titles for the Apple II and the MMI DAC sound card. He has written extensively in the areas of music education, music psychology, music and arts technology, and instructional development. Dr. Williams is the founding editor of the journal, *Psychomusicology* and has served on the boards of NAfME, Illinois Music Educators Association, and ATMI, and is past-president of the College Music Society. He chaired the NAfME task force for developing Opportunity-to-Learn Standards for Music Technology and, in 2001, received the Illinois Music Educators Association Distinguished Service Award for his work in music technology.

Peter Richard Webster is a Scholar-in-Residence at the Thornton School of Music at the

University of Southern California, Los Angeles. He was the John Beattie Professor of Music Education and Technology at the Bienen School of Music at Northwestern University in Evanston, Illinois, where he taught for 25 years prior to his position at USC. He has served as an administrator, teacher, and doctoral dissertation advisor during his career in higher education. He is the author of *Measures of Creative Thinking in Music*, an assessment tool designed for children aged 6–10. He has published over 80 works in numerous professional publications, such as *Music Educators Journal, Journal of Research in Music Education, CRME Bulletin, Contributions to Music Education, Arts Education and Policy Review, Research Studies in Music Education, Music Education Research, Psychomusicology,* and *Journal of Music, Technology and Education*. Webster is current serving as the editor for the College Music Society *Symposium*: *Instructional Technologies And Methodologies* (ITAM) section. He has authored chapters in several books and has edited several publications by Oxford University Press.