The ICMC 92 CD Stack

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Abstract

Following production of a commemorative compact disc for the ICMC 92 Proceedings, the authors developed a HyperCard-based stack which acts as a remote controller for playback of the ICMC 92 CD when using a CD-ROM drive. The stack contains a wide variety of information regarding the compositions on the CD and also serves as an example of the flexibility of the HyperCard format both in development and use for music education applications.

1 Introduction

One of the products of the 1992 International Computer Music Association Conference in San Jose, California is a commemorative compact disc of compositions and performances by established composers. This sixty-four minute CD, ICMC 92, consists of seven selections, ranging from four minutes to almost twenty minutes in length. There are a wide variety of performance and compositional techniques, with some compositions consisting of combinations of radiational acoustic instruments and electronics, and others completely electronic. The computer-based applications document work in software synthesis, real-time DSP, digital concrete, MIDI technology and algorithmic composition.

The diversity of style and performance methods exemplified in ICMC 92 motivated the authors to develop a means for further study of the collection for purposes of investigation and analysis in a pedagogic environment. Hypermedia is already being explored as an invaluable real-time performance media. Consequently, it would be fitting if the method of access and presentation was in the realm of modern information methodology.

In the past two or three years the focus on multi-media has developed into one of the strongest marketing efforts in the history of the personal computer. The appeal to the consumer of using a computer interactively to listen to music, watch movies, and play games, coupled with the industry’s glee at the prospect of selling billions of dollars worth of new hardware and software, have formed the perfect match for the prosperous, technologically aware public. In Silicon Valley, as in many places around the world, a stroll through any one of the many computer super-stores will quickly prove that multi-media is the product of the year.

The authors, with an appreciation for the value of multi-media to education, developed a plan to produce a CD-ROM including, along with the audio information, scores, sound and MIDI files, technical information, and graphics for each of the compositions on the ICMC 92 CD. The advantages of limited run CD-ROMs custom tailored to individual teaching environments are obvious. Since the costs involved in production of CD-ROMs are prohibitive, the authors researched the use of Claris’ HyperCard software for the same product using the consumer standard CD (Red Book format) already in production.

2 Development

Voyager’s AudioStack software [Riggin, et al., 1992], a utility stack for the creation of CD-controlling HyperCard scripts, allowed the authors to identify specific parts of the CD with a very fine resolution down to the block (or 74th of a second). The Audio-Event Maker module of the AudioStack is intuitive and flexible in creating buttons and controllers for specific audio portions of the CD. These buttons and controllers can be linked to scrolling text and graphics, and are immediately available for manipulation by the listener/user. (See Figure 1)

The technical knowledge required to develop such a stack is, at least initially, relatively minimal. A basic understanding of the authoring environment of HyperCard (scripting is rarely necessary) and a careful preliminary concept of the product is important. Changes are easily made in the development process and after the fact.

After contacting all of the composers for any material that they might find pertinent to the project, the
Jean-Claude Risset - Echo (for John Pieres)

Text narrative information, graphic representation of frequency analysis in real time.

Jonty Harrison - ... et ainsi de suite ...

Text description of piece in real time, technical information regarding production.

3 Further Implementation for Education

If the prospect of a computer in every home and classroom becomes a reality, then multimedia projects such as The ICMC 92 CD Stack should become a common part of the music curriculum. The multitude of uses can be easily perceived, not just as a teaching tool, but as a process of evolution. Students can easily learn how to create their own stacks and use such methods to explore other composers' works and demonstrate their own work to instructors. Just as many upper-level educational institutions are considering the acceptance of written student work on disc and even networks, the development of CD controlling stacks such as these by instruction and students alike would have immediate benefit to all concerned.

A pilot curriculum in any music program could utilize equipment that exists in most departments, or is easily attainable at reasonable prices. Most music departments or their affiliated colleges or universities have computer labs, and CD-ROM drives are commonly available under $500. Students and staff in such a program would be taught methods of authoring such stacks in a initial course that could be complete in ten hours of instruction. Mainstream music courses could then include "off the shelf" CDs (see CD-ROMs, but CDs that play in any consumer CD player), as part of the required materials, along with books, etc. Assignments could then be made for students to analyze music by creating accompanying cards with text information regarding particular audio sections. Creative instructors, given time to work with such a technology, could develop innovative uses for such stacks. The Voyager Company includes a section in their utility stack with a list of easily attainable ideas for this methodology including:

1. Creating a new stack that controls audio CDs
2. Scripting buttons that play an audio passage
3. Playing more than one passage from the same button
4. Pausing an audio passage
5. Highlighting the button for a passage that is playing
6. Checking whether there is a CD in the drive
7. Checking whether a specific CD is in the drive
8. Playing an audio passage on open/card or close/card

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9. Making an active list of passages
10. Playing a sequence of passages
11. Clicking on musical notation to play a passage
12. Measure-by-measure highlighting of musical notation
13. Real-time display of disc information
14. Creating a sliding scale for a CD
15. Sequence controller 1: Pop-up controller
16. Sequence controller 2: Multi-function button
17. Making messages appear while a passage is playing
18. Playing a passage with a running commentary
19. Changing cards during audio passages
20. Linking cards to CD passages
21. Playing a passage in a loop
22. Controlling multiple players from the same stack
23. Combining HyperCard sounds with CD passages
24. Listing track titles
25. Ensuring that user-entered CD times are valid

[Riggin, et al., 1992]

These ideas do not include the possibilities for MIDI implementation within the HyperCard format that are fairly easy to include through Opcode's MIDisplay stack and other related products.

If an instructor wishes to utilize audio that is not available on a commercially attainable CD, single "one-offs" and small runs of CDs can be easily produced using Sound Designer-type software and any of the manufacturers who will master DATS to CDs. The advantages of such a medium are obvious, and the usefulness of a minimal amount of extra hardware to control inexpensive and widely available compact discs should be attractive to anyone involved in music education. Creating a CD-ROM, with accompanying files and more memory-intensive aspects, such as Quicktime movies and color graphics is not an unattainable goal.

At this point, however, this task is more in the realm of writing a book, requiring more extensive technical expertise and a larger budget than the proposed HyperCard format.

The authors have also included a few sample cards in the stack that could serve as a template for student use in analysis of recorded works. These cards are easy to develop, and any instructor should be able to personalize them to his or her needs with a minimal degree of effort.

4 Conclusions

Obviously, the axiom of "garbage in, garbage out" is most obvious in computer assisted work of any kind. Educational uses of these sorts of HyperCard stacks will only be as good as the quality of the hard content included in the stacks, not just the flashy multi-media aspects. But common knowledge of methods for development of this sort of media can only lead to more aids for effective teaching and a greater depth of understanding of music for the student.

Note: Copies of the ICME 92 CD are available from the ICMA. If you are interested in a copy of The ICME 92 CD Stack, please contact the authors.

References