Computer Animations as a Tool for Teaching the Evolution of Musical Form

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April 8, 2001

Abstract
Macromedia's Flash software allows for the production of intriguing animations that illustrate concepts in music such as the evolution of forms, the transcription of early notation, and the technical analysis of individual works. These subjects are often forbidding for undergraduates but the animations present them in a more lively and engaging context. This is particularly true when the students are a part of the design and creation process.

Introduction
In the summer of 2000, I was awarded a Summer Technology Fellowship by the Associated Colleges of the South to create a series of animations to facilitate the teaching of music in the Middle Ages. This period of music history is difficult for music history students at first because they are dealing with unfamiliar tonal systems, notation, and liturgy. Gregorian chant which is so central to the history of western music is only vaguely understood even by members of the class from strong liturgical backgrounds. As a result, all of the details of how western music grew from the seeds of chant can become a somewhat confusing.

Animations provide a way to clarify the basic important ideas that came out of this period. Using a two minute animation to demonstrate the changing function of chant over a five hundred year period may seem like too much of a simplification. However, the animation can build the framework on which to add all the other contributing facts. The techniques used for the medieval animations were later used in student projects from all eras of music history.

Flash is ideally suited for creating teaching tools to be used over the Web. It allows for animations to import graphics and sounds and at the same time keep the file size manageable. The program can save the animation and place it in an HTML document in one stroke. The animations can also be saved as standalone documents and stored on a CD-ROM. This session will demonstrate some of the products created in the Rhodes music department and give a brief demonstration of exactly how this is done.

Victimae paschali laudes: How Sequences Work
An entirely different meaning for the word "sequence" than we usually think of in music is a sequence which is an accretion to the liturgy. It began with the addition of florid passages to the last syllable of the word "Alleluia." These passages became so lengthy that eventually text was added to help the singers remember the pitches of the new notes. This text was oven arranged in an ABBCCDD. . .X configuration. Hundreds of sequences appeared during the Middle Ages, only to be pared down to four after the reforms of the

Council of Trent in 1545-63. Victimae paschali laudes is one of the remaining sequences. Because of its ongoing appearance is an assortment of guises throughout the history of music, it is a good one to use to illustrate the idea of sequence to students.

The animation is built around an imported .aiff file. The program allows this file to be converted into a streaming version than can be linked to exactly the desired spot in the graphic animation. Successive screens show the score of the melody. The bottom of the page contains a graphic outline of the form with each set of verses being assigned a different color. The notes in the score correspond to the appropriate place in the graphic outline. Controller buttons allow the animation to begin, to pause, and to rewind. As the melody unfolds a box appears over the outline graphic at the appropriate place.

The URL for the animation is:
http://gray.music.rhodes.edu/musichtmls/flash/Victimae.html

The Guidonian Hand: Teaching Sightreading in the 11th Century
This animation brings to life an icon of early music, the Guidonian Hand. Guido d'Arezzo (c. 990-1050) was a monk who developed the set of syllables, ut, re, mi, fa, sol, la to help students memorize the patterns of whole steps and half steps in the G, C, and F hexachords. The syllables came from the first syllable in each phrase of the hymn Ut queant laxis. The pitches for each of the beginning syllables go up stepwise in whole steps except for the half step (mi-fa) between the third and fourth notes.

The Guidonian Hand associated each pitch with a joint in the hand. The hexachords overlapped so that some joints served as pivot points between two different hexachords. The hand took into account the B natural in the G hexachord and the B flat in the F hexachord. The drawing of the hand itself did not appear in treatises until the late 13th century.
Here, I have taken the drawing and used animation to show exactly how the hexachords overlap and to show how each joint of the fingers represent different pitches in different hexachords. A recording of chant is imported into the file and animated arrows follow the path that the choir director would have used as he employed this technique to remind singers of the notes in a melody.

The URL is: http://gray.music.rhodes.edu/musichtmls/flash/guido.html

The Medieval Church Modes
Gregorian chants is based around eight church modes, four authentics and their corresponding plagals. This system is somewhat more complex than the kind of major/minor scale system known to most undergraduates. In this animation the student is able to click on a mode name, hear it played and see its final and tenor indicated in red and green. It also allows the student to easily see the relationship between the paired authentic and plagal set.

The URL is: http://gray.music.rhodes.edu/musichtmls/flash/modes.html

The Use of Finals and Tenors in Church Modes
In the Middle Ages liturgical chants were written around eight church modes, rather than in the major/minor system most church music is written in today. These modes contain dominating pitches that roughly correspond to tonics and dominants in our tonal system. In this animation a piece of chant in Mixolydian mode is played and the final and tenor are indicated by red and green notes. This lets the students see how the melody goes from a starting place (red) to a secondary emphasis (green) and back again. It also helps the student understand how to read Gregorian notation.

The URL is http://gray.music.rhodes.edu/musichtmls/flash/Communion.html

Secular Song in the 14th Century
In the 14th century composers used arrangements of texts and music known as the formes fixes. These include the ballade, the virelai, and the rondeau. Usually their forms is indicated by a set of A's and B's, some capitalized and some not to indicate when words and music are both repeated or when the music is the same but the worlds are different in the various lines. These animations add a level of color and shape to help the student remember the forms. The URLs are:

Ballade: http://gray.music.rhodes.edu/musichtmls/flash/ballade.html

Virelai: http://gray.music.rhodes.edu/musichtmls/flash/virelai.html

Rondeau: http://gray.music.rhodes.edu/musichtmls/flash/rondeau.html

Evolution of Chant from the 9th to the 14th Century
Plainchant was central to the music of the Christian church for over a thousand years. This animation illustrates how it began as an unadorned, monophonic line that by the 9th century was doubled at the fifth, fourth and octave. By the 12th century, a new melismatic melody line appeared above the chant, forcing the individual pitches of the original chant increasingly apart. By the 13th century, two or more lines of music and sacred Latin texts were added above the chant and it became increasingly difficult for the chant melody to maintain its identity. Later, secular French texts were written above the chant melody line and it became the supporting bass line, its original meaning and function having radically changed. This can be seen as a reflection of the declining power of the church and the rise of the secular states during the same period of time. The animation uses some whimsical representations of the sacred and the secular to drive home the point.

Conclusion
I have used these animations in both beginning and advanced music history classes. Students find them to be engaging and appear to remember the concepts more firmly because of the animated graphic presentation. Students can be involved in creating concepts for new animations to illustrate other points. The process of conceiving and designing such an animation is yet another way to assure that students have internalized new ideas.