Isomorphism, Computers, and the Multi-media Work

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1. Abstract
Technology has always been an intimate collaborator among the arts. In recent years computer technology has manifested itself most strongly in music but there are now a number of equally well developed computer technologists in studio art and dance.

The significance of a technological parity among these "creative arts" cannot be underestimated. It makes possible a new integration among these art forms, an integration which has been sought since ancient Greece but has not been fully realized because the "tools" for such a melding were unavailable. With the present proliferation of computers in the arts we now have an assortment of capabilities which beggle the mind. The CAPHE Group at Connecticut College is pursuing a path by which computer technology in the arts can be integrated into the educational, as well as the creative, practices of students and faculty.

To this end, research facilities in computer art, motion analysis, and digital sound have been created and a team taught course, Computer Applications in the Creative Arts has been introduced into the curriculum. The issue of "integration" among these art forms, as well as the selection of "compositionally appropriate" technological means is central to our work. This paper describes a number of our concerns, as well as the program TS (Transfer of Isomorphic Structures) which we are developing as a "tool" for our research.

2. Historical Perspective
The attempt at a systematic joining together of the arts dates back to the Greeks, ca. 500 B.C. The writings of Pythagoras, Plato, Aristotle, and later, Quintilian and Claudius Ptolemy return periodically in the works of Boethius, Machaut, Caccini, Monteverdi, etc., on up to Wagner. It is in the latter's writings, specifically, The Art-Work of the Future, that each element of the "Gesamtkunstwerke" is discussed and put into perspective. He comments on the history of opera, citing Gluck and Mozart as the "idee-star tone-poets on the midnight sea of operatic music."1 However, he admonishes their achievements as "one sided deeds, i.e., they revealed the capability and the instinctive will of Music without their being understood by her sister arts."2 The remainder of Wagner's discourse is ambiguous and contradictory. His "Outline of the Art-Work of the Future" is poetic but reveals little in terms of any real plan or technical application. The promised "blueprint" is never delivered.

Our own century has, to date, not taken this task to heart. Attempts to reform opera have resulted in theater pieces and multi-media presentations. These "stage works" offer little in terms of any true syntheses of the arts and a strategy for a convincingly integrated collaborative work is still awaited.

3. Objectification and Process
The task of objectification is a difficult one. The distance most artists find existing between their intuitive notions of composition, the procedure by which they compose and the ultimate result, intellectually as well as emotionally, of that composition pose a number of interesting research problems. The need to translate those conceptions into a syntax that can be meaningful in a number of different arts complicates the picture enormously. Any

2 Ibid.

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attempt to carry out such a program results, necessarily, in a greatly simplified data structure, a data structure which can only be used as a "first step" for a prototype program.

4. TIS (CS)

TIS is a phase one project for the CAPHE Group. It is a program for the creation, selection, and modification of compositional elements in a collaborative work. Moreover, it is a program for the translation of compositional elements into a user appropriate domain. This is an ambitious project and is presently in its most preliminary stage. Our sole concern, at the moment, is mediating the conceptual distance among artists working in different artistic forms and providing a concrete isomorphic example which they may then interpret for their own design.

TIS operates in a knowledge based representation system (Artoon) using rules and facts to represent the compositional language it is concerned with. These rules and facts hold information about the relationships of verbal labels to compositional materials and techniques. They are responsible for helping to recognize how these parameters are related to one another, and in ways in which these parameters may be manipulated.

An oversimplification of this would entail a composer entering a compositional module such as a pitch. That information is then fed through the system and finds a number of isomorphic structures which have been assigned to pitch. An appropriate selection is made and should a choreographer be on the other hand of the user the corresponding movement will be assigned to the pitch. Should the composer go on to specify a transformation of that piece it will be correspondingly interpreted for the dancer and the other user. If the design is deemed inappropriate by the user, another will be selected. It is possible to organize groups of facts into contexts and to collect rules into rulesets which allow users to impose more complex forms of organization.

5. Conclusion

Our work has barely begun. The coming year will be a great test of the utility of TIS, as well as the possibilities of creating artworks within the limitations we have imposed on ourselves. Our first collaborations are eking their way out of the studio. Gothic Tempest, a computer generated video by Cynthia Rubin and David Smallley with a score realized by Noel Zahler has been part of the presentation of this paper. Additional works are planned involving dance and drama, we await the results. But, more importantly, we have entered into a forum from which we can only learn more about our own art in the light of our colleagues arts. Our investigations enrich our understanding of our own world and thereby, hopefully, enrich our individual disciplines and world of artistic endeavor.

References


Aristotle, Politics, V-VIII, tr. B. Jowett, in McKeon, op. cit.


---, Republic, III-IV and X, op. cit.

---, Timaeus, op. cit.