

# THE PROGRAMMING CHOREOGRAPHER

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Until a short time ago, few people could have imagined that the computer would play any role in the field of the arts. However, its use in the current art scene is an undisputed fact, characterized by a dynamism, manifested through many experiments in the fields of the visual arts, music and dance. For the public, the principal difference in the use of the computer in each of these areas is in the output, which could be an actual work of art or a series of instructions, the interpretations which will permit the production of the work of art.

The use of the computer in the field of dancing is of the second category. The output consists of information for the performance of the dancer, as well as for the technical team producing the show.

The objective of this article is to show how the computer can be used in choreographical programming for television, a field to which the author has been dedicating herself, in a pioneering fashion, in Brazil for the last few years.

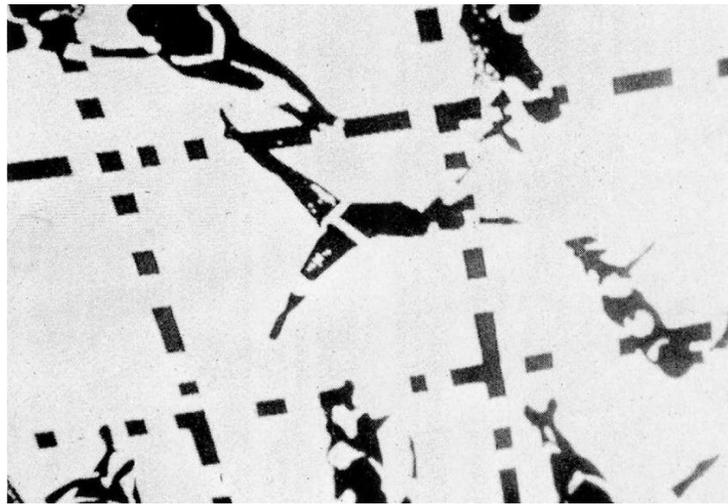
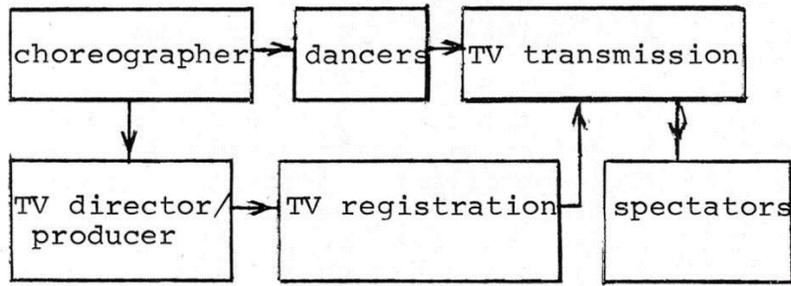
This process, instead of using the dancers as choreographic instruments, allows the choreographer to utilize the computer in the creative act, giving greater potential for new aesthetic results.

## THE FAILINGS OF TRADITIONAL CHOREOGRAPHY

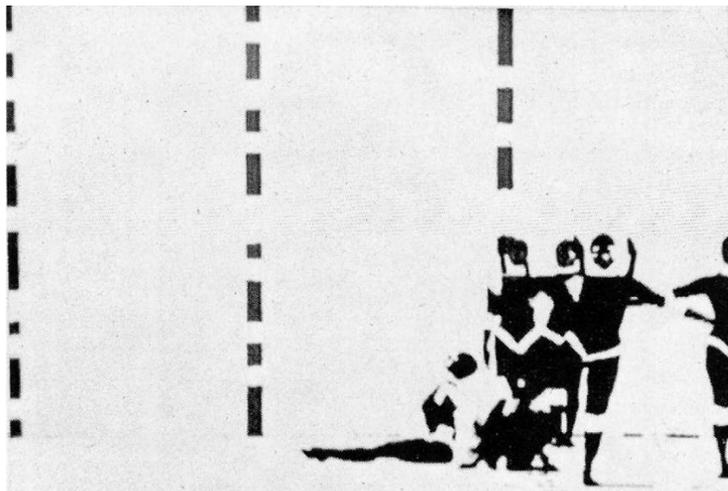
As I observed, the choreographer's function, when working in television, is to direct the movements of the dancers and establish an understanding with the television producer and director. They determine how the pre-arranged movements of the dancers will be registered by the television cameras, which transmit the dance. The message received by the spectator is a function of the movements of the dancers, captured by the cameras.

It could be said that the camera is the eye of a dynamic spectator.

The relationship between the dance-TV-spectator can be represented as follows:



ABOVE: "M3X3" - Camera in overview, from dance, experiments by Analivia Cordeiro, from the film, "Computer Dance/TV Dance", 1974.



ABOVE: "M3X3" - Camera in lateral view, from experiments in dance at the Computer Center, State University of Campinas, Campinas, Brazil.

Through practical experience I have observed three basic defects in this process. The choreographer's influence on the television is not direct. His (or her) behavior is determined by the television director and producer, who interpret and subjectively translate the intentions of the choreographer. This is a factor of interference of the choreographer's message. On the other hand, the television register -- in this case, the cameras -- act on the dancers without their being conscious of it, because the relationship, dancer -- camera, doesn't exist.

If we consider that the choreographer gives the dancer's a degree of freedom of expression, we will, in this case, have yet another factor of interference of the choreographer's message.

The choreographer communicates with the dancers through metaphors, to induce the dancer to make a movement or a series of movements he utilizes verbal or corporal expression. This relationship is unsatisfactory to the choreographer because "words cannot express the exact degree of the individual neglect or ability in the moving factor, (4) and also for the dancer, who through imitation of the choreographer's movement, limits his individual expression.

#### THE COMPUTER

The use of the computer in choreography for television could be of interest in the following areas of human activity:

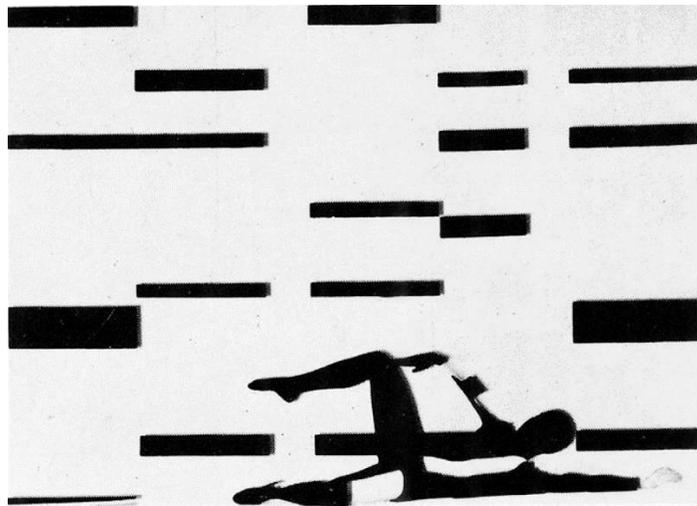
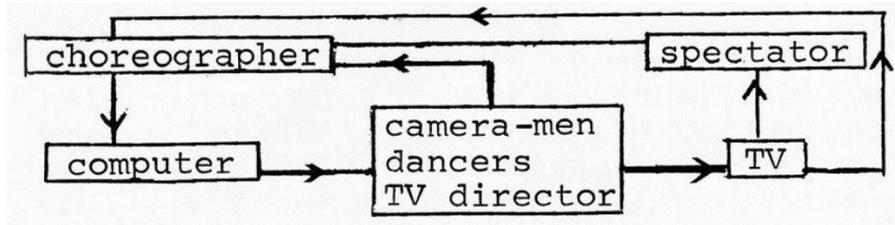
- To those concerned with the analysis of operational systems. These would observe the decomposition of the language of the dance and of television into their components, the algorithm which relates them, generating the choreography, the communication of the output of the computer to the interpreters.
- To dancers and choreographers seek- new forms of notation and reading/ interpreting human movement.
- To television teams, who would be working in a new context, unique dance, that is a mobile and rhythmic photographic subject.
- To everyone interested in the application of computers in new fields.

#### THE STAGES OF THE CREATIVE PROCESS - ARTIST-INTERPRETER-SPECTATOR

The objectives of this process can be divided into the following stages:

- To choose from among the components of the language of dance and television, those relevant for the transmission of the message wanted by the choreographer.
- To relate these components in an algorithm which will give the element indispensable to the transmission of the choreographer's message.
- To communicate these elements to the participants in such a way as to allow the transmission of the artistic message to the spectator.

The aesthetic object will be produced through the actions of the interpreters. This process of production is called computer-assisted art (2) or computer-aided art. The creative process is integrated by the choreographer, the computer, the interpreters (dancers, cameras, TV director/producer) and spectators. Its integration can be expressed by the following flow chart:



ABOVE: "0° - 45°" - Experiments in dance and television, Campinas, Brazil.



ABOVE: "M3X3" - Camera in lateral view, television dance, Analivia Cordeiro

To instruct the computer, the choreographer uses the syntax of the language of dance and television and elements of scenography. "But in dance, analysis of movement is often personal and rarely detailed and scientifically based. We know that the performance of a computer depends entirely on the material fed into it, and so for dance the elements of movement must be clearly defined and the right selection made to describe what is wanted" said Ann Hutchinson (3), in a "A Reply" to the A. Michael Noll article, 1966, "Choreography and Computers", Dance Magazine, January, 1967.

#### THE COMPONENTS OF DANCE AND TELEVISION

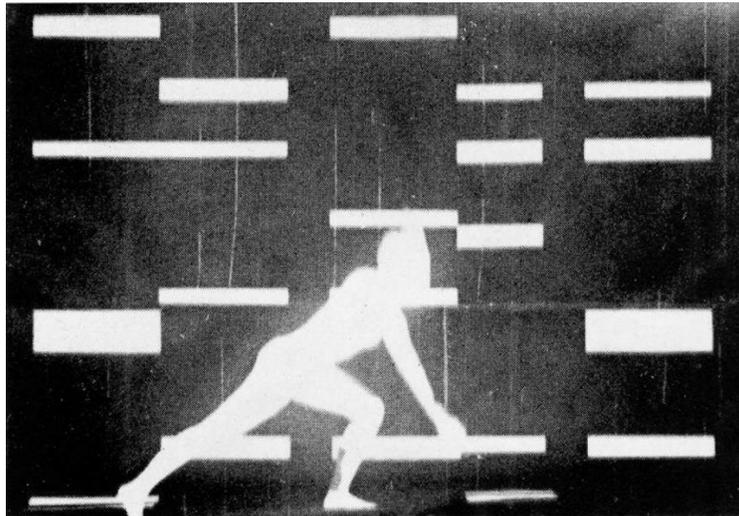
##### The components of the dance are:

- DISPLACEMENT IN SPACE -- The path of the dancer in space.
- POSITIONS OF THE BODY -- "The trajectory of the movement can delay materially in the change of an object or in a new body's member position. (4)
- MUSCULAR STRENGTH -- The energy expended by the dancer in a given movement.
- FLUENCY OF THE SEQUENCE OF POSITIONS IN THE TEMPORAL DIMENSION -- The relationship between time, the sequence of positions and the muscular effort of the dancer.

##### The components of television are:

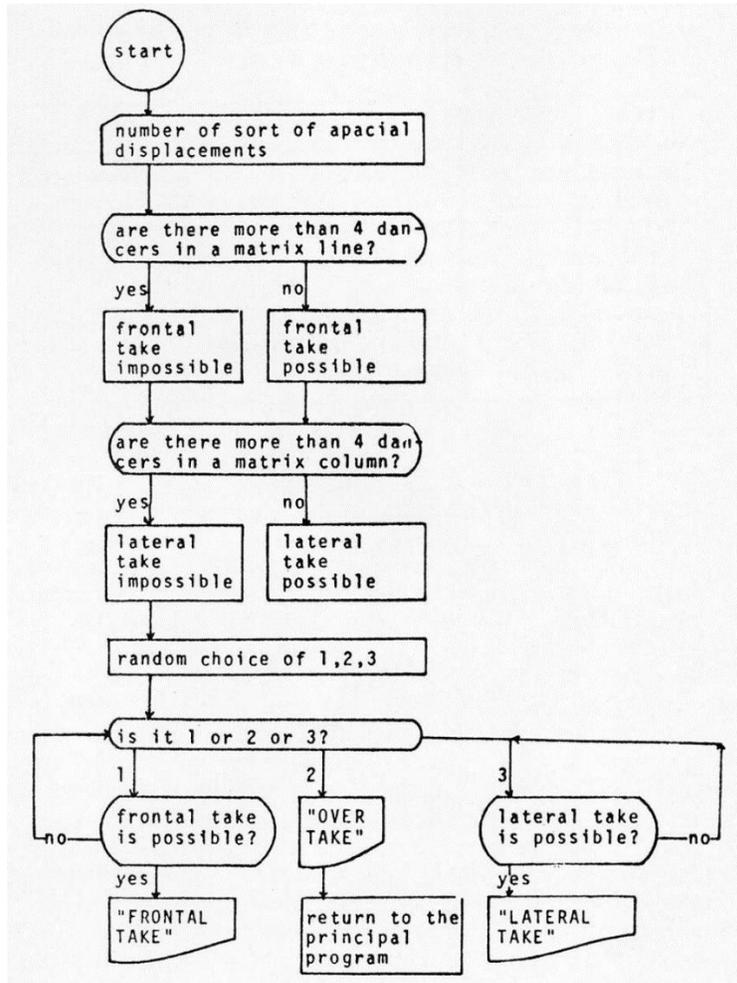
- CAMERA ANGLE -- The angle of observation of the object.
- PLANES OF FOCUS -- The distance between the observer and object.
- VISUAL EFFECTS -- Visual alterations in the register of the camera.
- CHANGE OF CAMERA -- Passing from the image seen by another.

BELOW: An example of visual effects, in which the dancer moves as a white form with horizontal white lines.



## THE ALGORITHM

By selecting components and establishing formal relationships between them, the choreographer structures an interactive dance-TV system. In this way he creates the algorithm which will generate the choreography he imagined. (In the dance-TV system the elements of scenery are explicit) An example of the subroutine "camera takes", processed after the subroutine "movement of the dancers" in the M3x3 choreography:



"The basis for the incorporation of chance may reside in this: stylistic regularities, as captured in programs, are not sufficient for the clear-cut description of a work of art, and in consequence offer certain degrees of freedom, each style permitting a multitude of realizations. In conventional artistic production, these empty places are filled intuitively." (2)

## INTERPRETATION AND EXECUTION

The next stage consists of the translation of the algorithm into computer language. After processing the computer furnishes the elements for the interpretation of each of the participants.

The dancer receives instructions like:

time	4s	5s
displacement in space		
camera	over	frontal
postures		

The camera-man and TV director receives:

time		
camera angle angle	over	frontal
planes of focus	medium	close
visual effect	total high-contrast	

The scenographer receives the costumes and scene description.

In acting, the interpreters must execute the elements given. The choreographer considers these indispensable for the transmission of his message by television. Those considered dispensable are left open, for the interpreter to create his own character. For example, the information give to the dancer consists of time, position of the body (in accordance with the camera view-point), displacement in space, while muscular effort and fluency of the sequence of positions remain undetermined. The energy used is the component, which to my mind gives greatest expression of individuality. "It gives us the capacity to produce new positions, encounters and percussions, new contacts and possibilities of tactile experiences both within the body itself and in relation to its surroundings." (4)

During the practice the interpreters can criticize the elements which are impracticable, and suggest new ways of expressing these elements, which would assist in the full realization of both the dancers and the choreographer's aims. This justifies this creative process: the programming and its actual verification will compose a dynamic element in the relationship planning/practical application.

In his interpretation, the dancer executes the positions within the determined time.



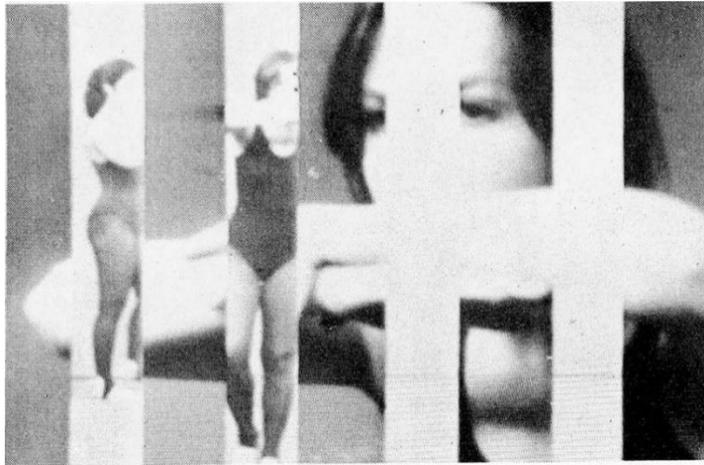
*ABOVE: The author, Analivia Cordeiro, film-maker, dancer, and choreographer. Miss Cordeiro graduated in Architecture, and began using the computer in dance in 1973.*

Also, the transition from position to position is performed according to the given instructions for spatial displacement. The dancer is free to describe the trajectory connecting the positions. However, the choreographer is aware of all possibilities available to the dancer. For example, a dancer following a rapid rhythm has four possibilities of dynamics of movement:

number	time	muscular effort	trajectory
1	fast	light	straight
2	fast	strong	straight
3	fast	light	indirect
4	fast	strong	indirect

In their interpretation, the camera-man and the TV director read the instructions:

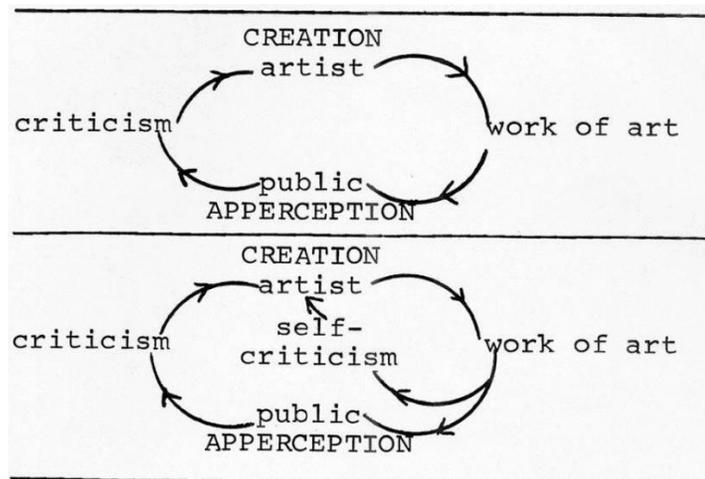
camera front - medium plane - vertical line effect - 4 seconds and in this case, choose an image with a medium plane and this type of effect, within the given time.



At the moment all the participants execute their parts simultaneously, the programmed result is transmitted.

#### THE PUBLIC, CRITICISM AND FEEDBACK

Only a few spectators have the opportunity to express their opinions. At the present, this is done through personal contact with the choreographer. As he and the other interpreters are also spectators, self-criticism is the most common form of criticism.



"The social communication in art. The feedback process of art incorporates in the production phase a corresponding circular process where the artist, by letting his work set upon him, successively perfects it, in terms of trial and error." (2)

#### THE ADVANTAGES OF THIS CHOREOGRAPHIC PROCESS

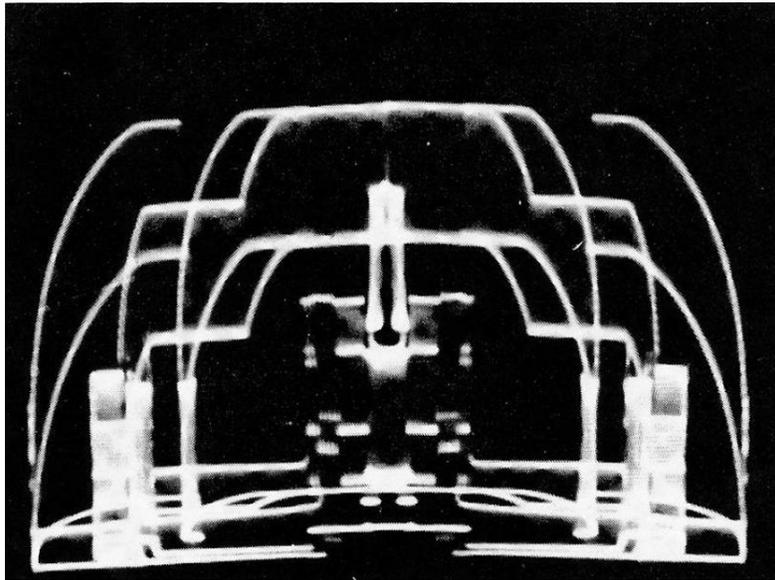
I would like to point out the most relevant characteristics of this process:

- Through the computer output, the choreographer does not communicate metaphorically with the dancers, that is with words or with his own movements.
- The choreographer objectively transmits the possibilities of movement of the body in the space and time given, supplying written and graphically syntactical components of the movement.
- The objective is to program the visual aspects of the movement. In television transmission, the camera is the eye of the spectator.
- The relationship interpretation/programming presupposes both pre-determined and undetermined elements. We are not concerned with making an animated film using real dancers.
  
- The interpreters have a precise awareness of their own interpretations, that is to say, at each moment the camera knows how to focus on the dancers, and the dancer knows how he or she will be seen by the cameras.
  
- This process does not claim to be the only solution for the problems of production of dancing on television its significance is in the way it makes explicit the relationships which occur in any television-dance production. Because of this it can be used in different types of dance production.
  
- Every choreographer has his or her own personal style. One of the manifestations of this diversity is the degree of freedom given the dancer this method can be used by other choreographers in different ways. For example, the choreographer may opt for not specifying body-positions.
  
- In operational terms, a fruitful suggestion would be the use of this process by a creative team composed of the choreographer, musician, producer and director of television, scenographer, computer applications analyst - that is to say, the specialists in the fields involved: dance, television, and computing.

#### REFERENCES

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- (3) Hutchinson, Ann, "A Reply," Dance Magazine, January, 1967.
- (4) Laban, Rudolf. Choreutics. London: MacDonalld and Evans Ltd.

- (5) Laban, Rudolf and Lawrence, F. C., Effort. London: MacDONald and Evans Ltd., 1974.



*ABOVE: The Theater graphics by Otto Beckmann.*