

0° $\longleftrightarrow$ 45°

0° $\longleftrightarrow$ 45° version I and version II

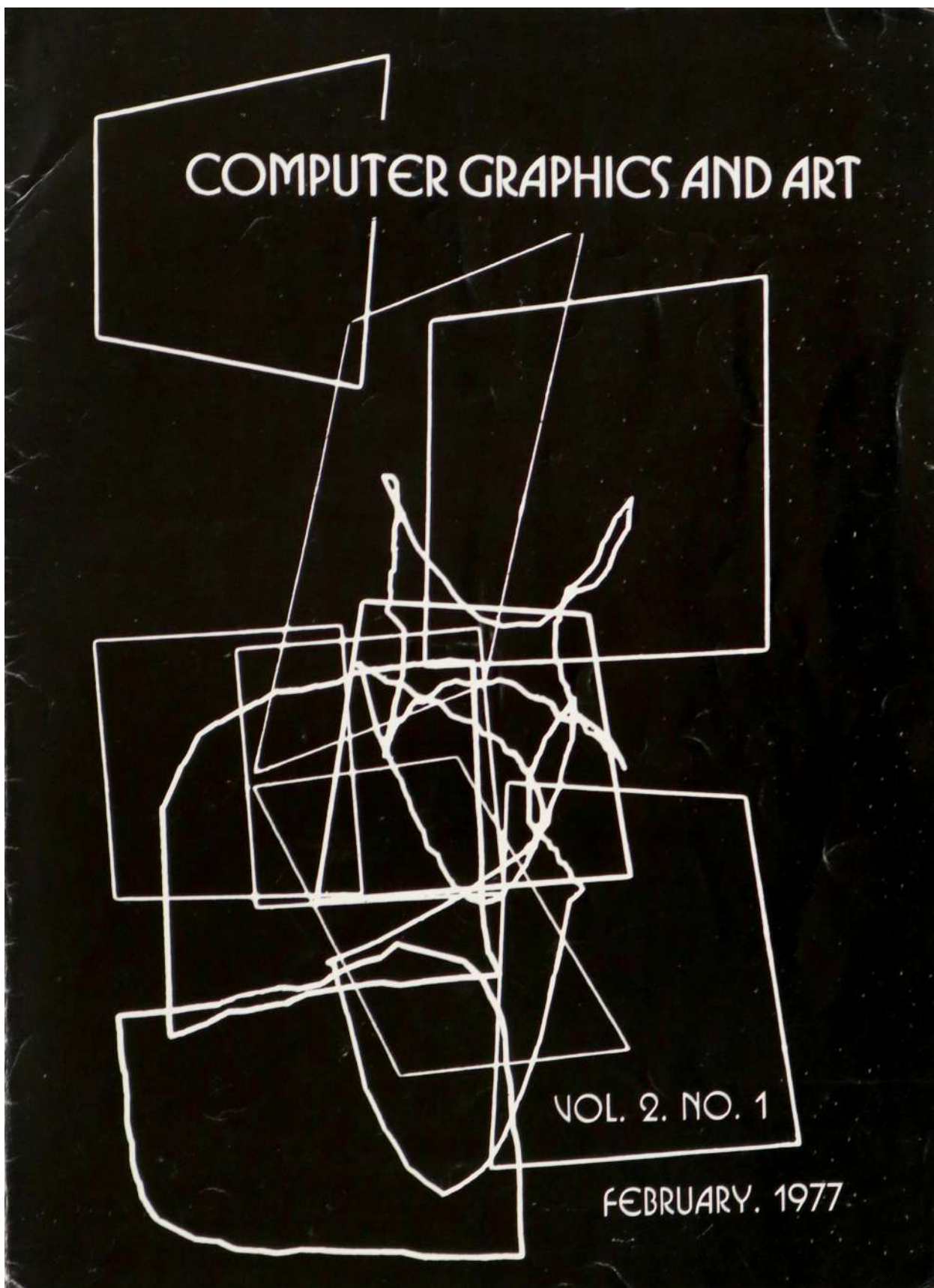
A solo where the dancer merges with the scenario while performing rounded or diagonal movements, as indicated by the dance notation generated by the computer. In the version I the scene is made of horizontal lines in varied sizes choosed by random. In the version II, the scene is made up of diamonds and black rectangles and a sequence also picked at random by the computer. The dimension of these forms are similar to the dancer's body measures. This way the dancer and the scene are one.

0° $\longleftrightarrow$ 45° version III is an historical work of computer dance, one of the precursors of video clip. The movement of the whole body is seen through a computer static notation. The body images appear only in close-ups, and the image of the whole body is composed only in the mind of the viewer. Thus, the movement of the whole body is the sum of the details of the body that are linked in the spectator's mind, and never in the video image. This work is a study of the degrees of visual intelligibility of movement and a portrait of our fragmented corporal image, consequence of the hectic lifestyle and stress of modern society. Thus, as only the movement notation shows the body position, the brain of the viewer makes up the dance performed by the dancer. An experiment about our perception of space-time.

As mentioned in the catalogue of the exhibition *Coder Le Monde* (2018, Centre Pompidou – Paris), “qualifiée d’enfant prodige du computer dance” (Domus, n.544, Milan, mars 1975) par Pierre Restany, Cordeiro produit ses premières danses informatiques entre 1973 et 1976: *M3x3*, *0=45*, *Gestures et Cambiantes*...À l’aide du langage de programmation Fortran l’ordinateur génère aussi bien des séquences de pas aléatoires pour les danseurs que des instructions pour l’équipe vidéo.”

It is important to remark that all the versions follow the same dance notation script. The camera changes, following the conception it is the eye of the public. In the versions I and II the camera is static focusing the whole scene. In the version III the camera is close-up focusing separated parts of the body.

ABOUT COMPUTER VIDEO DANCE CREATION PROCESS



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# THE PROGRAMMING

# CHOREOGRAPHER

by Analivia Cordeiro  
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*The author, formerly from Sao Paulo, Brazil, is now living in New York City for a year. She describes her experiments in choreography and television at the University of Campinas, Brazil.*

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.

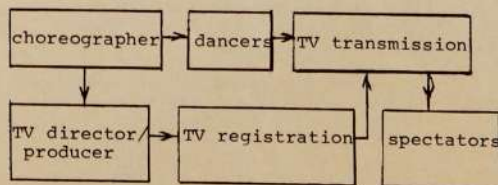
This process, instead of using the dancers as choreographic instruments, allows the choreographer to utilize the computer in the creative act, giving greater potential for new aesthetic results.

## THE FAILINGS OF TRADITIONAL CHOREOGRAPHY

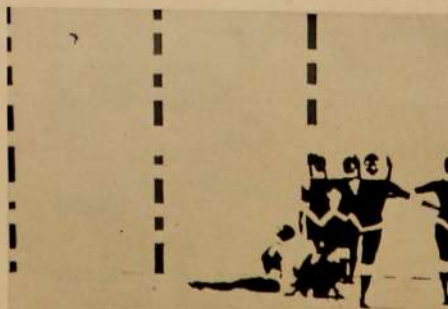
As I observed, the choreographer's function, when working in television, is to direct the movements of the dancers and establish an understanding with the television producer and director. They determine how the pre-arranged movements of the dancers will be registered by the television cameras, which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

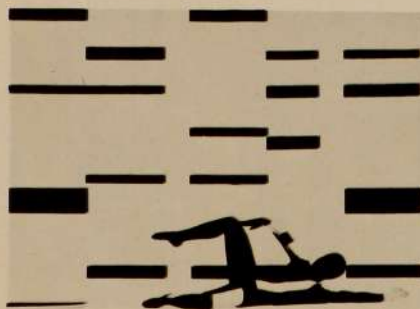
If we consider that the choreographer gives the dancer's a degree of freedom of expression, we will, in this case, have yet another factor of interference of the choreographer's message.

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 the 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.



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

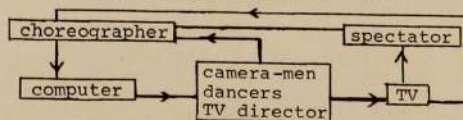
- To dancers and choreographers seek new forms of notation and reading/interpreting human movement.
- To television teams, who would be working in a new context, unique dance, that is a mobile and rhythmic photographic subject.
- To everyone interested in the application of computers in new fields.

#### 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 elements 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, camera-men, TV director/producer) and spectators. Its integration can be expressed by the following flow chart:



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

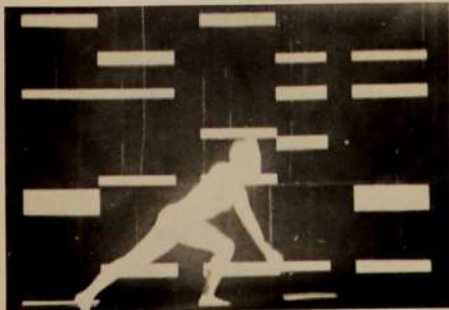
The components of the dance are:

- 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 cangle 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.

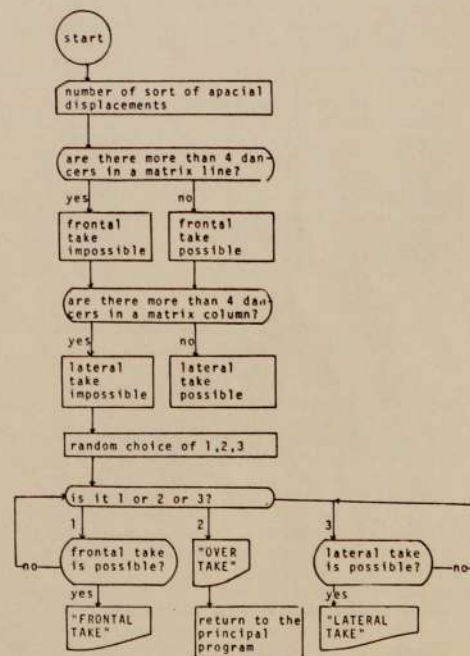
BELOW: An example of visual effects, in which the dancer moves as a white form with horizontal white lines.



#### 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  $M_{3 \times 3}$  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)

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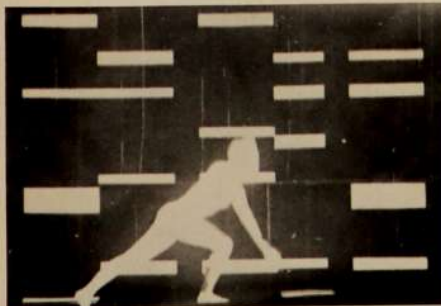
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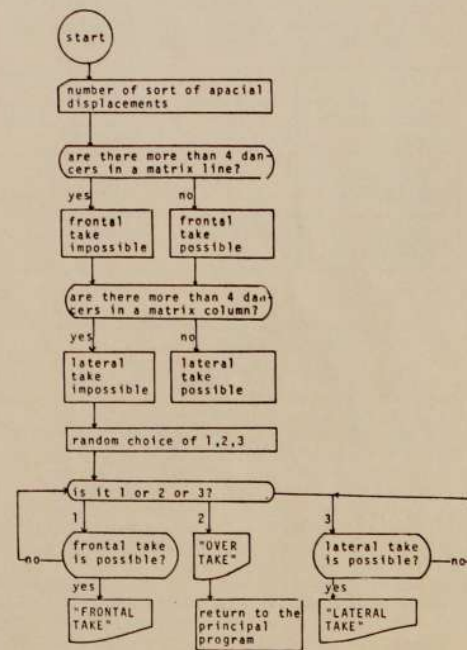
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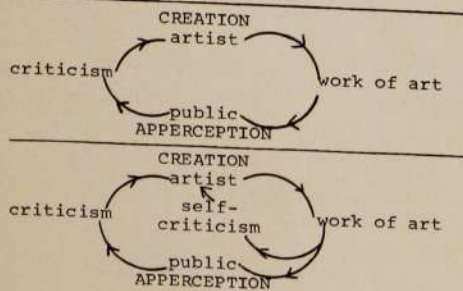


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At the moment all the participants execute their parts simultaneously, the programmed result is transmitted.

#### 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:

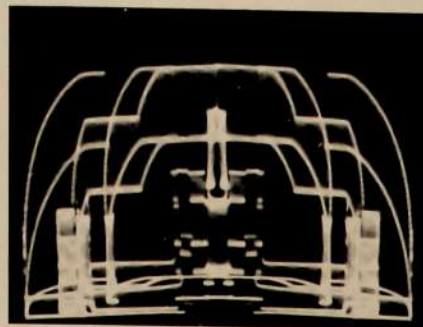
- Through the computer output, the choreographer does not communicate metaphorically with the dancers, that is with words or with his own movements.
- The choreographer objectively transmits the possibilities of movement of the body in the space and time given, supplying written and graphically syntactical 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/programmation presupposes both predetermined 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

- (1) Cordeiro, Analivia and Zancheti, Silvio, 1974, "Computer Dance TV Dance," Universidade Estadual de Campinas, Campinas.
- (2) Franke, Herbert, W. Computer Graphics - Computer Art. New York: Phaidon, 1971.
- (3) Hutchinson, Ann, "A Reply," Dance Magazine, January, 1967.
- (4) Laban, Rudolf. Choreutics. London: MacDonald and Evans Ltd.
- (5) Laban, Rudolf and Lawrence, F. C. Effort. London: MacDonald and Evans Ltd., 1974.



ABOVE: Theater graphics by Otto Beckmann.



## 0°←→45° EXHIBITIONS

1974 "The Bat-Sheva Seminar on Interaction of Art and Science", Jerusalem, Israel.

1974 "LatinAmerica 74" at the Institute of Contemporary Arts, London, England.

1974 Esthétique et Mass Media: la Télévision course taught by René Berger, Université de Lausanne, Switzerland.

1975 "Latin America 74" at Espace Cardin, Paris, France.

1975 "Latin America 74" at the Galleria Civica D'Arte Moderna, Ferrara, Italy.

1975 "International Conference Computer & Humanities / 2" at University of Southern California, Los Angeles, USA.

1975 Goethe Institute, São Paulo, Brazil.

1976 "20th American Dance Guild Conference" presented by Jeanne Beaman, Massachusetts Institute of Technology, Cambridge, USA.

1976 public TV station - WGBH -, Boston, USA.

1985 "Multimedia", Armando Alvares Penteado Foundation, São Paulo, Brazil.

1985 "Brasil'70 / 80 - new media / multimedia", Fundação Armando Alvares Penteado, São Paulo, Brazil.

1989 "Carlton Dance Festival", at the Museum of Image and Sound in São Paulo, and at Espaço Laura Alvim in Rio de Janeiro.

1996 "4. Image Technology Studio", UNESP / SESC / SENAI, São Paulo, Brazil.

1996 "Encontro Laban 96", SESC, São Paulo, Brazil.

1997 "Mediações", Instituto Cultural Itaú, São Paulo, Brazil.

1997 "Precursor and Pioneers of Contemporary Art", Paço das Artes, São Paulo, Brazil.

1999 "IX Festival Internazionale de Videodanza - Il Coreografo Elettronico", at the Institut Français de Naples Grenoble, June 1999, Italy

2005 "Audiovisual Mostra da Dança em Pauta", Centro Cultural Banco do Brasil, SP.

2015 Anita Beckers Galerie booth at the ARCO International Art Fair, Madrid, Spain.

2016 "A Dança como Cinema", CINUSP Paulo Emílio, USP, Brazil.

2019 SP-Arte, Masters sector, Isabel Aninat Gallery, São Paulo, Brazil.



## ANALIVIA CORDEIRO

Dancer, choreographer and architect, Analívia studied dance under Laban's Method in Brazil and modern dance at Alvin Nikolais, Merce Cunningham, Gus Solomons Jr., Viola Farber Dance Studios in New York. Later, she studied the corporal conscience method Eutony, in Brazil. Graduated in Architecture at University of São Paulo, Brazil; master degree in Multimedia at State University of Campinas, Brazil and PhD at Communication and Semiotics at PUC-SP, pos-doctorate at Federal University of Rio de Janeiro UFR, Brazil and University of São Paulo.

Member of the International Dance Council CID of UNESCO.

One of the computer dance world pioneers and the Brazilian video-art pioneer (1973), she created multimedia performances and videos; published a book/video Nota-Anna: an electronic notation of human movement based on the Laban Method, about her movement notation software Nota-Anna; organized the book Waldemar Cordeiro – Fantasia Exata; and is curator of his collection.

Her videos were exhibited in several events like: International Festival of Edinburgh, 1973; XII Bienal de São Paulo, Brazil, 1973; The Bat-Sheva Seminar on Interaction of Art and Science, Jerusalém, 1973; LatinAmerica 74 at Institute of Contemporary Arts, London, 1974; LatinAmerican Films and Video Tapes at Media Study of State University of New York, 1974; Arte de Sistemas in LatinAmerica at International Cultureel Centrum, Belgium, 1974; Latin America 74 at Espace Cardin, Paris; and at

Galleria Civica D'Arte Moderna, Italy, 1975; International Conference Computer & Humanities/2 at University of Southern California, 1976; WGBH - TV Public Channel, 1976; 20th American Dance Guild Conference, 1976; Art of Space Era at Von Braun Civic Center of Huntsville Museum of Art, 1978; Brasil Séc.XX, Brazil, 1984; Arte e Tecnologia, Brazil, 1996; 27th Annual Dance on Camera Festival, New York, 1998; Festival II Coreografo Elettronico, Italy, 1999; International Seminar Invenção, Brazil, 1999; The 1999-2000 Sawyers Seminar at University of Chicago, 1999; L'Ombra dei Maestri – Rudolf Laban: gli spazi della danza, Università degli Studi di Bologna, Italy, 1999; JavaOne Sun's 2001 Worldwide Java Developer Conference, San Francisco and 2003 JavaOne; Made in Brazil, 2003/5, Brazil, Dança em Pauta, 2005, Brazil, "Cinético-Digital", 2005; 2005NokiaTrends, 2006 Dança em Foco, Mostravideo Subjetividades, 2007 Brazil, SIGGRAPH; Bienal Mercosul, 2009 2011 Zonas de Contato, Paço das Artes; "Manuara" no MuBE, São Paulo, Brasil, ARCO art fair, Madrid winner of the BEEP de Arte Electronica prize, 2015; Expanded Senses, B3, Frankfurt, 2015; Moving Images Contours, Tabakalera, San Sebastian, Spain, 2015; Tanz Bewegung Geste Bild, Kunstahalle Göppingen, Göppingen /DE, 2019; Faces, Es Baluard, Palma de Mallorca, Spain, 2019; Chance and Control, Victoria&Albert Museum, London, 2018; Radical Women: Latin American Art, 1960-1985, Hammer Museum, LA USA Brooklyn Museum, New

York USA, Pinacoteca de São Paulo, SP Brazil 35.

International Film Festival, Jerusalem, Israel, 2018; Encoder Le Monde, Centre Pompidou, Paris, France, 2018; Unforgettable Kicks, Museu de Arte Moderna do Rio de Janeiro, Rio de Janeiro, Brazil, 2018; Algoritmos Suaves, Valencia, Spain, 2018; Tanz.Bewegung. Geste. Bild, Germany, 2019; Faces, Maiorca, Spain, 2019; Mutatio, Garage Renault, Paris, France; LB/festival de video online \_curator, Brazil.

Her works belong to collections like the archive of the artist Oskar Schlemmer, Switzerland, Victoria & Albert Museum collection, London, BEEP Award for Electronic Art, Madrid, Reina Sofia Museum, Madrid, Museum of Concrete Art, Ingolstadt, Museum of Contemporary Art of USP, Brazil, Museum of Modern Art MoMA, New York, Itaucultural, Brazil.