ANALIVIA CORDEIRO

HUMANMO

IMPRES

EXPRE

OPTION

OMISSION

ANALIVIA CORDEIRO

CONTENT

BRUSH STROKES

This book presents my production from 1973 to 2015. The chapters are organized according to the subjects being researched, with no commitment to a timeline. So you can better understand the content of each of the surveys, texts accompanying images.

All research conducted in my artistic career, as well as this book deal with the human movement in several areas, as a dancer for the stage, choreographer, video art, education systems, motion notation research, anthropological studies, body therapy. All these areas related to the understanding, knowledge and creation of human movement.

Initially, I would give the reader a sketch my training, which was done in two areas: visual arts and dance.

My father, Waldemar Cordeiro, was an artist, art critic and theorist. Through living with him at home and at national and international cultural environment, I witnessed and absorbed key creative concepts for the understanding of human artistic creativity. I followed the movement of concrete art in Brazil, the *pop-creto* movement, the kinetic works and, nally, his pioneer production in computer art.

In long conversations we had, coordinated with readings, I learned to observe the artistic phenomenon according to an objective approach: the visual language has a syntax independent of a subjective interpretation. For the concrete art, this syntax fol-lows the principles of Visual Gestalt K. Koffka .

This way, their research, broke the line of History of Art, generating a fundamental artistic movement for creative activities in the urban-industrial environment and later digitalized. Concrete Art opened the possibility of a systemic organization of the act of creation through algorithms on the processes of human artistic composition in various fields visual arts, dance and others . A revolution in art.

My dance education began at 7 years old. My teacher, Maria Duschenes, was formed directly by Rudolf von Laban, in Germany. She was Hungarian, and after World War II, came to Brazil. She had a solid knowledge and depth at work, teaching this posture to children and adults. Her classes were special: warm up exercises, sequences to be re-peated and at the end an improvisation. There was always a moment of the dancer's own creation, directed by professor.

In the rst year of school, from 7 to 8 years rather than improvise I was watching other people. This was very important to me. By the time I started to improvise, I felt like I already was familiar with movement expression. At age 11, Dona Maria invited me to the Merce Cunningham and John Cage dance presentation, in Rio de Janeiro. The modernity and good humor of the presentation was remarkable in my life. And at age 12, I was already on stage, working with professionals. Everything was very, very fast.

I started my classes because I had trouble stepping straight, and the doctor recommended dance lessons. My body was extremely exible, an advantage that helped me a lot. I did dance and athletics. With 15 years I got hurt in athletics, and continued only with the dance.

At the time, I had already acquired a very clear notion of composition and space, and I started to develop experimental ways of annotating choreography to help with rehearsals, since Dona Maria was forever forgetting sequences. I helped the group and at the same time shaped my understanding of the language of dance, not only from the point of view of dancers' bodies but composers too: the questions of space, distribution, composition itself, music, how dancers may be positioned and their differing individual skills. I looked at each person and the composition and thus gained an understanding of the whole. And specially the ow of gures moving in space. Seeing my interest, Dona Maria taught me Labanotation and gave me the book *Choreutics* from Laban. I improved my studies watching many Oskar Schlemmer lms over and over and observing the photographic works of Moholy-Nagy, both from Bauhaus; as well as looking at McLaren animations.

At 16, I started ballet classes and other types of dance too, which expanded my vocabulary. I was soon invited to participate in works like the Structured Improvisation with the Clyde Morgan group, which was a group of dancers improvising in front of the TV cameras. This work was a tremendous frustration because there was no dialogue between the camera shooting and what I was dancing. Explaining: when I stopped moving, the camera registered my whole body; and when I gave a wonderful jump, the camera lmed my nger. When I saw the re-sult, I was horri ed. And I thought: wow There must be a way to a better dialogue between the camera and the movements.

At that time, the regular dialogue between the TV and dance was hours and hours of the TV crew watching the dance and talking to the choreographer to plan camera shots, which cost a lot money and time. I had the idea of doing this through computer planning. At the time, I often observed my father working with a computer. And, I was passionate for mathematics and dance language. This way, computer dance for video was born.

The video seemed to me a wonderful way to travel the world with dance groups, reaching places far away with an affordable cost. Besides, the video was also a very interesting form of communication. I made a rst project and was invited to the International Edinburgh Festival. This invitation opened the possibility to record the video in *TV Cultura,* in Brazil. Since I was very young at that time, they would never make such an expensive production without an important invitation as that of the Edinburgh Festival.

I ended this production on May 73, and I told my father, you need to see this video. He answered, Wait a little bit, because I'm very busy. now Three weeks later he died at age 48, sleeping. He did not even see my first work, this was very sad. But psychologically I decided to face his death as an opportunity to do something very good. I took this very sad event, as a positive energy in my father's memory.

Computer dance for TV is a system that relates the elements of dance language with elements of the TV language through a computer program. So the dancer knows how it is being seen by the camera, where he has to move within the scene, and the camera-man, as well as TV director, know what the dancer is doing and where he is at all times. At the time, this is what should be done to optimize the dance-TV relation.

During computer programming, I realized that there were times when the goal was not enough to de ne the aesthetic choices. For example given

that the movement of the body was based right angle movements, there were many possibilities to compose these movements: two arms, two legs, torso and head, within all anatomically possible possibilities. What would be the aesthetic reason for choosing among the various possibilities? None. At this point I used the random choice. This feature is present in many computer art creations of that time, and I believe that today also.

The computer videodances and its innovative aesthetic proposal solved many practical problems. But others came up. As an example: the com-puter output was a numeric vector of six digits: the rst was the right leg position, the second the left leg position, the third was the right arm position, the fourth was the position of the left arm, the fth of the trunk and the sixth the head position. So each digit corresponded to the position of a body's member. As the Computer Center did not have a graphic plotter, I decoded these vectors drawing stick- gures complemented with the performer displacement in space of the scene, which would be the dance notation. But movement reading was unfamiliar to the dancer if compared with words reading. The dancer training was based in imitating the teacher or improvising and feeling his own body. Never reading notations.

In addition, this form of writing movement was not anamorphic with the movement, so the dancer had a mental work, which no way helped kinesthesis of its movement, a factor that created an obstacle to the correct interpretation of the choreography. On the other hand, as the notation was static stick gures, the dancer had to create a connection between the positions stick gures ; so he was involved in creating his own movements.

This was a positive aspect of this work, and opened the question of the human position with regard to the rules imposed by the computer and the opportunity opened to the creativity. The freedom/

planning binomial permeated my entire career, and pervade to this day, our entire society. Technology is essential to human life. This reality challenges people to put themselves comfortably, emotionally, with the rules imposed by technology, inducing them to create behavioral alternatives. Thus the signi cance of this work extended beyond art and aesthetics.

In 1975, I lived for two months and a half in an indigenous tribe in Amazonia. This experience was an important complementation in my studies of human movement. I had the opportunity to know early man and the origin of Brazil. It was remarkable and unforgettable. I brought an extensive photographic record and Super-8 movies, edited and saved in digital format, many years later.

In 1976, I graduated at the College of Architecture, and I moved to NYC to dance. I needed to be around people who were familiar with my work language. It was a wonderful life during two and a half years, I worked hard and exchanged experiences with other artists; because in Brazil I felt lonely, doing a different art. In NY I felt participant of society. I had contact with the generation of post-modern dance: I studied with Merce Cunningham, attended the studio Alvin Nikolais, I took lessons with Viola Farber and Gus Solomons Jr., with whose company made street-performances ; I danced in Janette Stoner company and took part of video Merce Cunningham and Charles Atlas workshops. I could also present my own choreographies in *avant-garde* dance performances.

Returning to Brazil, I started a videodance research from 1980 till today , addressing the relationship between the act of dancing, video camera and the method s to create choreography. Each work explored these relationships in a different way, formalizing my thoughts at each stage of my career.

To earn some money, I became a teacher of the art of movement to children based on the Laban method, introducing also the video language to them. It was a very happy time of communication with people. At the same time, I was in contact with other countries where I could display and introducing also the video language to them. It was a very happy time of communication with people. At the same time, I was in contact with other countries where I could s h o w and disseminate what I was creating, but I never travelled far because of a nancial issues. The e-mail was nonexistent and the communication was slower and more formal, because all that was written should be more prepared and designed. It was very different from our present world.

In 1982, I began the research Nota-Anna, whose rst name was Trajectory-Notation, with the intern at the Polytechnic School of USP, Nilton Lobo. The Nota-Anna was born of the de ciencies that I detected in the computer dances notation. To answer the question: what is the best way to communicating the movement of a writing mode, reaching the lay people beyond the professional, i.e. a broad perspective of communication? The ideal way would be like the eye itself sees the movement, i.e. the trace-forms the movement leaves in the air. I decided to use the video to, through their frames, reach the trace-forms of different body parts in the air. And mathematically speaking, by calculating the angle in the x-y axes of the Cartesian system we obtained body position on the z axis, i.e., we transformed the two-dimensional video image into a three-dimensional image. This research was long because it required several exchanges of equipment since the technology we had avail-able was unable to keep up with our ideas; and in this search, I ended up marrying Nilton. In 1994, after the birth of our son, Thomas, I started my master s degree which finished the Nota-Anna as software and a book

called Nota-Anna an electronical notation of body movements based on Laban method. For this same thesis, I put in video format the Laban method, which opened me the possibility of an excellent relationship with international institutions.

With the Nota-Anna I put movements of very important gures from the physical point of view, whose movements could be learned, Marilyn Monroe's walk, Bruce Lee's kick, Pele's soccer kick or and Elvis dance move.

Watching the old historical lms I transformed the frames of these iconic gures movements in three-dimensional space trace-forms. It was an extremely meticulous work, with a very beautiful result.

Nota-Anna results showed the lines drawn by the joints of the body in space. A non-material reality, that visually reveals the ephemeral movement. I was very impressed by these images and found that to proceed would need to study more deeply the sense-perception of the human body. I needed to know the subtleties of the movements observed through the inward aspect of the body. I practiced for several years Eutony, which is a technique of body harmonization, rather complex, and the Feldenkrais Method. A new perspective of feeling my own body movements and dance moves led me to create new videodances in a more intuitive and introspective process than before. I practice these techniques till today.

I also realized that the union of sense-perception with the visual results of Nota-Anna could be a wonderful discovery for the correct use of technology in teaching and creation in the eld of non-verbal communication. These two elds, apparently antagonistic, could work in conjunction. The new generations, who live so intimately with video-games, computers, virtual reality, etc., would have no dif culty in uniting these two practices. Glimpsing a future use for this notation research, I did my

PhD thesis called Cyber-Harmony: a dialogue between sense-perception and technology.

In order to do the thesis I put Eutony practices in video format, developed movement sequences using the Nota-Anna to be learned by lay people, and created videos for training of muscle strengthening. This content is in Internet as a proposal for a very clear social background, because many people could never have access to a high-level body education work, which are usually aimed at people who can afford good lessons. This work would help people to maintain good health and balance the body. For example, a dressmaker who is leaning over a sewing-machine all day due to the demands of their profession ends up having a lot of pain. A body practice of good quality can bring relief, a life of better quality. This thesis was supervised by Prof. Arlindo Machado 2001-2004, and was highly appreciated by experts at the time. Both on my master's degree, and my doctorate, I had grants from the Foundation for Research Support of the State of São Paulo FAPESP , and be very well-received by this foundation so demanding was an honor.

After this thesis, I spent several years dedicating myself to my family life. I missed dancing which caused me huge headaches. I ended up going to Rio de Janeiro, for a job at IMPA Institute of Pure and Applied Mathematics where I felt enormous energy, and realized that I had accumulated energy, very vibrant, very happy body, and I realized that I had accumulated very strong tension in my body during these years. I decided to change my life. Rio de Janeiro got me and also shocked me with the co-existence of social classes: very poor, poor, hungry together with rich people, where the rich does not see the poor. In response, did my post-doc, which is a literacy system through short videos for mobile. 242 videos made in collaboration with the educator Eleonora Sampaio. I wanted to give a real contribution, I made it without any nancial assistance.

I made it as a contribution to Brazil, where there is a huge lack of education, and millions of people who need help and have no place where they can seek it. With the strong popularity of Internet and mobile phones, these devices have become a way to reach people in the most wilderness and remote addresses, even in their own cities, in places that they could never be taught, or in places that I could never go. Currently the daily access rate is more than 2000 people. I have reached my goal. During these years, the issue of education was formatted by the ideal situ-ation that is to teach many more people than those who I might have contact in person. I sought to convey teachings through videos of various types from theory to body therapies. The concept of body education is broad, reaching from preparing and conditioning the body to the encouragement of creativity of people on the move, always through the videos.

On the other hand, since the death of my father in 1973, I realized that a heir must work to transform his inheritance, in a cultural asset. When I received this inheritance my duty was to turn it into a historical work, that is, what was alive, pulsating, controversial would have to go to be considered part of art history. This was a very delicate job because the memory that people had of my father was of someone who made enemies with easily, someone who imposed the sense of resistance and struggle. My father had a very striking gure, he was considered a controversial man, and he really struggled a lot for your ideas. With work to take care of publications and texts, slowly, over decades, the work of my father became a cultural asset both Brazilian and international. This work intensi ed from my son's birth, and I realized that only I could make this historic mission, due to the closeness that I have with his work and friendship that we developed as father and daughter. I then took care of all in the broad-

est possible way: works, restorations, publications, archive, documents, contacts with researchers and critics, all with a air for nancial acrobatics in order to make it happen.

In 2000, I met Luciana Brito, who became a partner in this cultural struggle. In early 2012, nally after several attempts at different institutions, we did a retrospective exhibition and the publication of a book by ItauCultural. This exhibition won two awards best exhibition of the year by APCA association of critics of art from São Paulo and ABCA Brazilian association of critics of art and the book presented my father in his integrity: as an artist, critic and theorist of art and landscape designer. A key stage of my mission had been accomplished.

At this time, my life as an artist began to blossom again. I was introduced to Anita Beckers which has become a partner, encouraging and taking ideas to show my work, and encourage the historical recognition of my research. I started a phase of materializing my videos as installations, sculptures and still images. This is a very elaborate work, which unites all my knowledge since childhood. This is the last phase of my work.

In short: for more than 42 years I have researched the area carried out in the eld of expres-sion of human movement and media arts that has at its core the manifestation of the human body, as a complex organism. Moving my body, I understood the meaning of the binomial organic/arti cial. The organic factor is spontaneity, improvisation, loose emotion, the unpredictable. The arti cial factor is planning, interoperability between different medias, the scienti c study of the body, the predictable. Those two factors guided or determined are the core of my artistic researches from 1973 until now. During my artistic research, I always refused fads, just to be up to date, juggling technology per se. I always prioritized integrity, consistency and long term time for maturation of creation, which di-rected me to the creation of speci c software made specially in order for my work to dialogue with the scienti c world and the cutting-edge research.

São Paulo/Rio de Janeiro, July 2015

Analivia is endowed with the qualities and require-ments for dance, and with such control over her body, there is no limit to the imagination of move-ment, it easily conforms to any choreographic idea, she does not seek to symbolize anything speci c, just using movement itself as a communication channel. For her the medium is the message , and dance is being aware of each moment, feeling the ow of forms in space instead of representing something.

Using the body as an instrumen t that is capa-ble of transmitting dance moves without super u-ous interferences, Analivia is an artist who seeks to give a new direction to choreographic art, exploring choreography in computer, video and lm, as well as movements drawn from the everyday.

To watch the spectacle of Analivia, you must have new eyes to the new .

Presentation of the Call choreography, Contemporary Dance Event of São Paulo; October, 1980.

I   COMPUTER VIDEODANCE

The research Analivia carried out from 1973 to 1976 pioneered videoart in Brazil and computer dance in the world. The computer processes the information using a Fortran IV language program. The output is instructions to coordinate the performance of the dancers and the video team to make the videos, as for example, M3x3, considered the rst Brazilian videoart. This process involves various artistic issues discussed in the article below.

JOHN LANSDOWN

THE COMPUTER IN CHOREOGRAPHY

Although readers of this journal will be aware that few areas of endeavor are untouched by the impact of the computer, it will surely come as a surprise to many that even ballet, perhaps the most human of all arts, is being in uenced by computing techniques and concepts.

In dance the human body is the instrument the choreographer plays upon with the active cooperation of the dancer to create scenes of the gure in motion over time. There is in dance the creativeness of the choreographer in devising interesting, or exciting, movements; there is the creativeness of the dancer in achieving these movements that sometimes even overshadow the original creation.

My question to myself ten years ago was, there is a place for the computer in this intensely creative, intimately personal art? I was familiar with some of the attempts to utilize the computer to compose poetry or prose, to produce kinetic sculpture, or to create music. I tried to draw common principles from these efforts to apply to ballet.

My rst experiments with computer to generated dance produced sequences that were pleasing to dancers and viewers, but they provided for too little human participation, while running up computer time charges beyond my means. Later experiments, as you will see, struck what I felt to be a better balance between human and computer participation.

BACKGROUND

As far back as 1964, Jeanne Beaman and Paul Vasseur at the University of Pittsburgh used computers to generate simple sets of instructions to be performed by solo dancers. In 1966, Michael Noll produced a computer-animated lm showing primitive stick- gures moving about a stage to programmed choreographic instructions. More recently Brazilian choreographer Analivia Cordeiro has used programs to generate dances and their television coverage. A great deal of work, however, is aimed not at creating dances but at assisting choreographers and others in visualizing body movements.

During the late 1960's Israeli choreographer Noa Eshkol and others at the University of Illinois worked on computer-assisted movement notation and produced programs which allowed a choreographer to see a machine-plotted representation of the movement paths of limbs. At about the same time, Carol Withrow at the University of Utah devised programs to describe limited movements of a stick- gure by relating angular displacements of limbs to curves drawn on a graphic display.

Currently, there is a great deal of work on computer interpretation of dance notation, notably in one scheme known as Labanotation. Zelia Wolofsky at Simon Fraser University wrote a program to output stick- gure interpretations of Labanotation

commands, and this work has been enhanced and developed by Barenholtz and others. Smoliar, Weber, and Brown at the University of Pennsylvania have described work for the interactive editing of Labanotation scores. Janette Keen at the University of Sydney has developed a high-level computer language compatible with Labanotation and suitable for the graphic display of movement. Savage and Of cer at the University of Waterloo have devised an interactive system. ...

THE PROGRAMMING CHOREOGRAPHER

INTRODUCTION

Until a short time ago, few people could have imagined that the computer would play any role in the eld 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 elds 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 eld 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 programmation for television, a eld to which the author has been dedicating herself, in a pioneering fashion, in Brazil for the last few years.[1] 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:
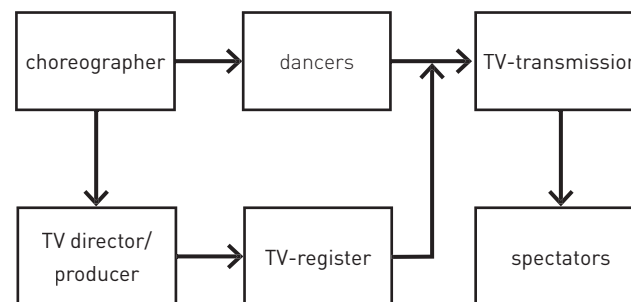
Through practical experience I have observed three basic defects in this process. The choreographer's in uence on the television is not direct. His or her behavior is determined by the television director and producer, who interpret and subjectively translate the intentions of the choreographer. This 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

1 CORDEIRO, Analivia and Zancheti, Silvio, 1974, Computer Dance TV Dance, Universidade Estadual de Campinas, Campinas.

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, 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.

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 elds.

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, cameras, TV director/ producer and spectators. Its integration can be expressed by the following ow chart:
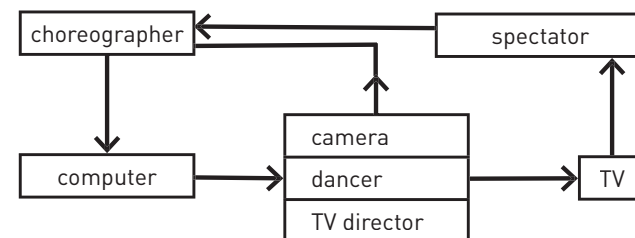
To instruct the computer, the choreographer uses the syntax of the language of dance and television and elements of scenography. But in dance, analysis of movement is often personal and rarely detailed and scientifically based. We know that the performance of a computer depends entirely on the material 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.

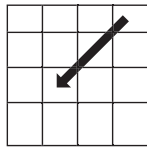2 FRANKE, Herbert, W. Computer Graphics -Computer Art. New York: Phaidon, 1971.
3 HUTCHINSON, Ann, A Reply, Dance Magazine, January, 1967.

THE COMPONENTS OF DANCE AND TELEVISION
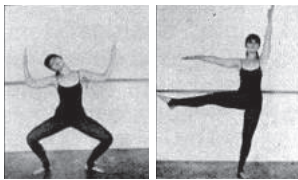
The components of the dance are:

Displacement in space
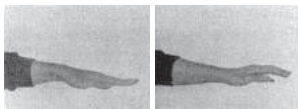The path of the dancer in space.

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.

Muscular strength
The energy expended by the dancer in a given movement.
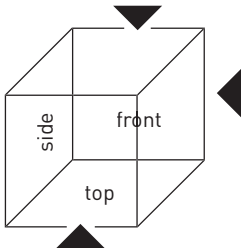

Fluency of the sequence of positions

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
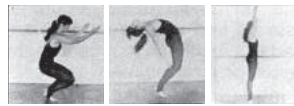The distance between the observer and object.

visual effects
Visual alterations in the register of the camera.

change of camera
Passing from the image seen by another.

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:
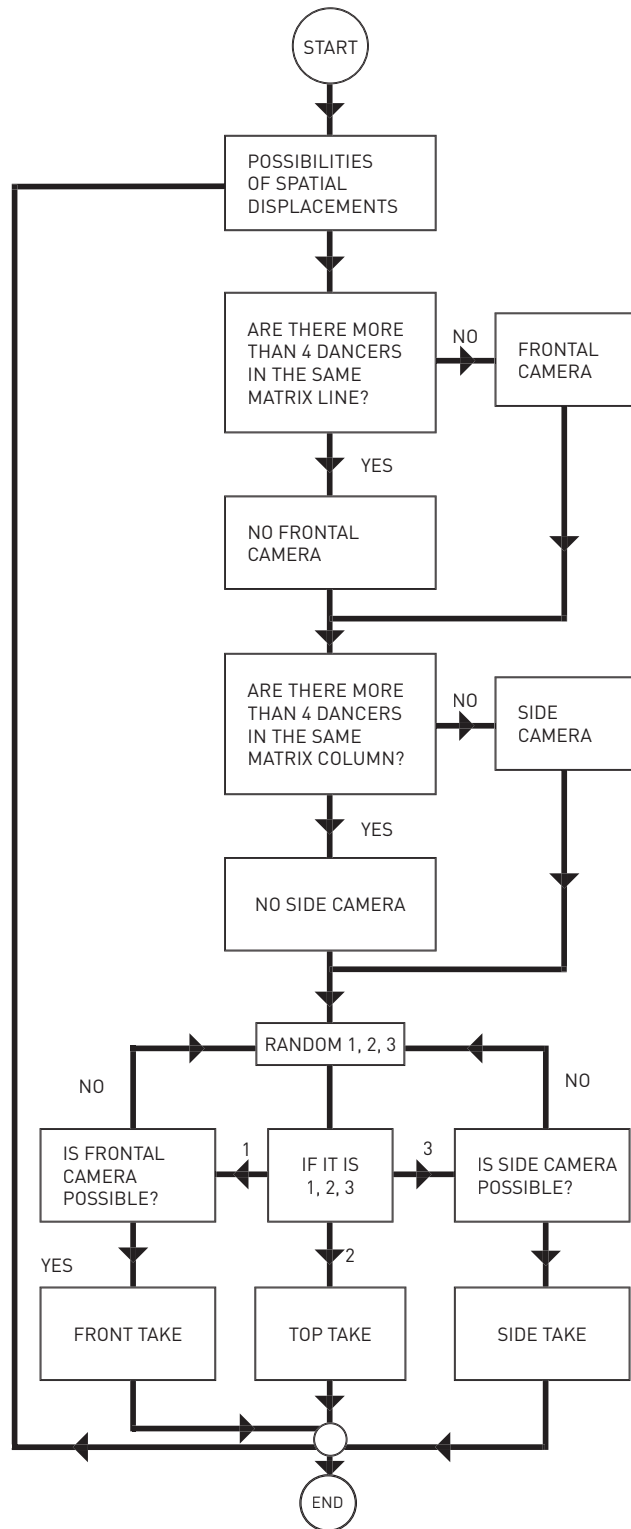
The basis for the incorporation of chance may reside in this: stylistic regularities, as captured in programs, are not suf cient for the clear-cut description of a work of art, and in consequence offer certain degrees of freedom, each style permitting a multitude of realizations. In conventional artistic production, these empty places are lled intuitively. [4]

The dancer receives the information like this:

time	4 seconds	5 seconds
displacement		
camera	top	front
body position		

The TV director and the cameraman receive the informations like this:

time	4 seconds	5 seconds
point of view	top	front
take	long shot	long shot
visual effect	high contrast	

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: The camera-man and TV director receives: The scenographer receives the costume 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,

START

POSSIBILITIES OF SPATIAL DISPLACEMENTS

ARE THERE MORE THAN 4 DANCERS IN THE SAME MATRIX LINE? — NO → FRONTAL CAMERA

YES

NO FRONTAL CAMERA

ARE THERE MORE THAN 4 DANCERS IN THE SAME MATRIX COLUMN? — NO → SIDE CAMERA

YES

NO SIDE CAMERA

RANDOM 1, 2, 3

NO — IS FRONTAL CAMERA POSSIBLE? ← 1 — IF IT IS 1, 2, 3 — 3 → IS SIDE CAMERA POSSIBLE? — NO

YES — FRONT TAKE — 2 — TOP TAKE — SIDE TAKE

END

4 FRANKE, Herbert, W. Computer Graphics -Computer Art. New York: Phaidon, 1971.

for the interpreter to create his own character. For example, the information given to the dancer consists of time, position of the body in accordance with the camera view-point , displacement in space, while muscular effort and uency 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 per-cussions, new contacts and possibilities of tactile experiences both within the body itself and in relation to its surroundings. [5] 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 justi es this creative process: the programming and its actual veri cation will compose a dynamic element in the relationship planning/practical application. In his interpretation, the dancer executes the positions within the determined time. 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.

top point of view

possibilities of body positions to achieve the position drawed from top point of view
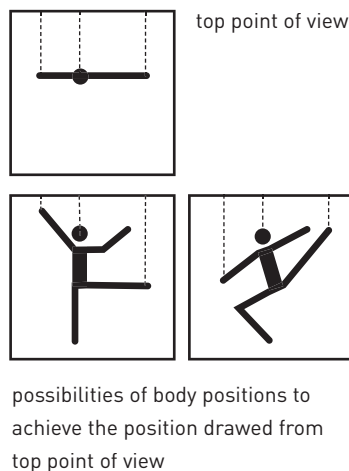
However, the choreographer is aware of all possibilities available to the dancer. For example, a dancer following a rapid rhythm has four possibilities of dynamics of movement: In their interpretation, the camera-man and the TV director read the instructions: camera front   medium plane   vertical line effect   4 seconds and in this case, choose an image with a medium plane and this type of effect, within the given time.

n.	time	muscular strength	spatial drawing
1	fast	weak or light	direct
2	fast	strong or heavy	direct
3	fast	weak	exible
4	fast	strong	exible

The nal body positions can have different movement trajectories as transitions, for example:

or

body position 1   body position 2
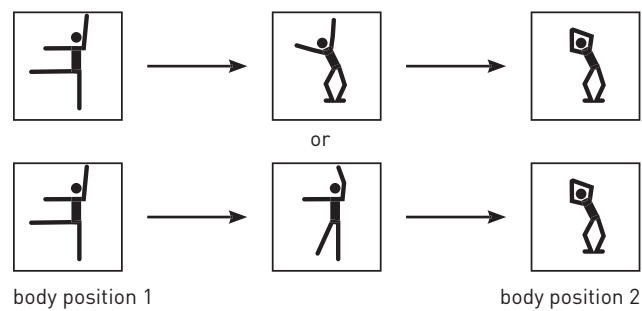
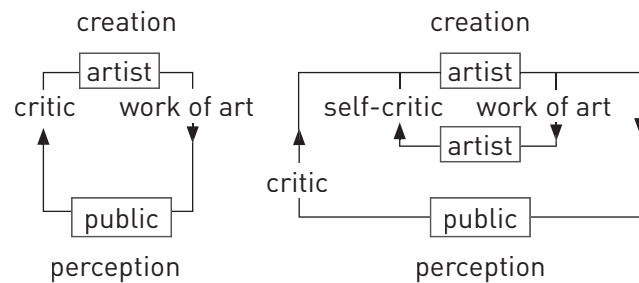At the moment all the participants execute their parts simultaneously, the programmed result is transmitted.
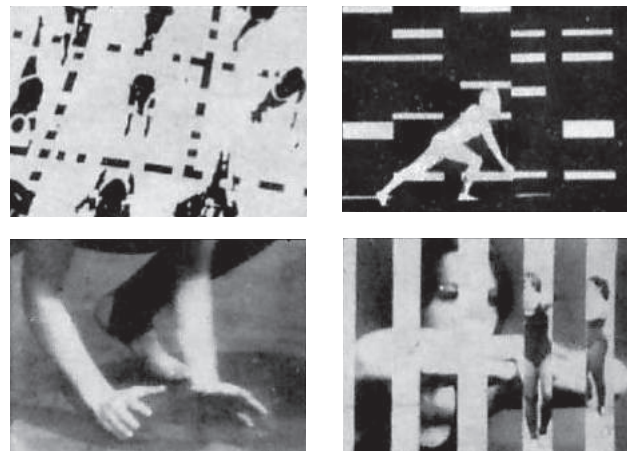
5 LABAN, Rudolf. Choreutics. London: MacDonald and Evans Ltd.

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. [6]

creation   creation

artist   artist

critic   work of art   self-critic   work of art

                                           artist

                                critic

public   public

perception   perception

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 syntatical 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 lm 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 signi cance 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 elds involved: dance, television, and computing.

6 LABAN, Rudolf and Lawrence, F. C. Effort. London: MacDonald and Evans Ltd., 1974.

COMPUTER DANCE TV TV/DANCE
A review by MARTIN TRACY

Dance is easily the most complex art form, and I would be the lost to gainsay any tools which might prove useful in dealing with it. However, I have noticed a recent tendency toward the Buck Rogers syndrome, that is, the use of sophisticated high-speed computers for tasks which might better be done by human beings. Analivia Cordeiro's recent Computer Dance report is an example of one such enthusiastic effort. The computer has been used to generate sequences of random steps, quali ed by artistic rules, that could quite literally be pulled out of a hat.

Cordeiro prefaces her description of computer dance with an attempted scienti c analysis of the aesthetics of choreography. The computer is seen as the intermediary between the artist and audience. Video is seen as another intermediary and various possible relations between the artist and the machinery are discussed. At times, this discussion becomes very technical and dif cult to understand. For example, on page 41 we nd the following:

Nowadays the artist's control over his work of art as a message to the spectator is possible on two levels: intuitive, on the level of signi ed/signi cant; scienti c, on the level of signi cant. The scienti c control of the signi cant is, in this case, the explanation of the physical changes in the work of art in function of the psychophysiological reactions of the spectator and of the performers. This control makes it possible to predict the type of fruition of the work by the spectator and the performers.

Cordeiro describes three computer dances: M3x3 , 0°↔45° and Gestures. The rules of each dance have been programmed as functions which generate instructions for both the dancer and the video cameraman. The dancer is allowed enough choreographic freedom to smooth the instructions into a dance, and both the dancer and the camera, man are allowed to interpret any unspeci ed elements. The results of this camera-dancer interplay must be fascinating, but since neither computer output nor video tape is included in the article, we will never know.

The use of programmed functions to generate random instructions has a serious limiting factor: a different program must be written for each dance. This tends to obscure the underlying structure of a dance form because the structure appears to be different for each dance production. An interesting approach would be to design a grammar for a dance form and to let each production be generated from this grammar.

Ironically, it is in the very eld of computer science that most of the work on grammatical productions is being done Cleveland&Uzgalis 1975 . Consider the following rule from a Chomsky 1956 Type 2 grammar, expressed in Backus Normal Form 1963 .

 Dance : : = BOW Step sequence   BOW.

The terms enclosed by are non-terminals and will be later explained. BOW is a terminal or nal production. The rule thus reads a dance is the word BOW or a Step sequence followed by the word BOW. The next rule completes the grammar will be later explained.

By starting with the root   Dance and replacing each nonterminal we nd with one of its alternatives we will eventually produce a string of nothing but terminals. STEP JUMP STEP BOW is a valid production of Dance but STEP JUMP JUMP HOLD BOW is not since there is no way to generate two JUMP 's in a row.

 Step sequence :: = STEP   Step sequence STEP   Step sequence   JUMP STEP I   Step sequence   HOLD

Programs exist which accept a grammar as data and generate productions from it. The grammar provides both a readable de nition of the dance form and the set of rules to generate dances. Of particular interest to dance scholars is work being done on program which accept sample production as data and attempt to generate the underlying grammar Tracy 10,76 ; It is in directions such as these that the computer promises to be a powerful new tool for dance researchers.

SOURCES CITED

BACKUS, John W.1963 Revised Report on the Algorithmic Language, ALGOL 60,   Peter Naur, ed., Communications of the ACM 6 January . p. 17. An excellent description can be found on pp. 26-40 in Cleaveland&Uzgalis 1975 below.
CHOMSKY, Noam.1956 Three Models for the Description of Language. IRE Transactions on Information Theory 2 3 : 113-124.
CLEAVELAND, J. and R. Uzgalis.1975 Grammars for Programming Languages: What Every Programmer Should Know About Grammar. N.Y.: American Elsevier.
TRACY, Martin J.1976 Dance: Pattern Recognition and Generation in Current Trends in Computer Uses for Language Research, Sally Sedelow, ed. The Hague, Netherlands: Mouton. Forthcoming.
MARTIN J. Tracy, M.A. in Dance Ethnology; Ph.D. candidate in Biotechnology, University of California, Los Angeles; author of article on comparative movement notation and computer assisted choreography; currently teaching in the Department of Dance, University of California, Los Angeles.

Dear Ms Cordeiro,

Your lm and your program were presented last week as part of my presentation for the 20th American Dance Guild Conference at the Massachusetts Institute of Technology. Linda Desmond, computer applications analyst from M.I.T. Computer Science Center commented on your program and Nancy Mason, Dance Coordinator of a public television station in Boston, WGBH, which has done many videodance programs lamented on the video aspect of your lm .

It is interesting to note that what you were doing was perfectly clear to Linda Desmond, while your text was a complete confusion to Nancy Mason. In general musicians in attendance understood what you and I are doing but many dancers felt, Why bother with a computer.

Several young people, students at M.I.T. and other universities spoke with me afterwards. Two had done their own programming, one in modern dance with a program similar to mine and one in square folk dancing in which the calls were also programmed. Certainly there was a warmer reception to my presentation than when I spoke at the Binational Dance Conference in 1971.

You may be interested to know that Jean Babilée did a TV program in Paris in 1971 of a computer generated ballet called Time Sharing.

Of your work I found that 0°   45° seemed to be liked the best while Gestos caused the most comment. By the time you get this letter these lms will be on their way back to you by a slower route. And if I ever get my work-book published with several dances, I'll send a copy of that also. In the meantime I hope you will keep me informed of your progress.

Thank you again for giving me the opportunity to both see and share your work at the ADG Conference. I shall send you any write-upsof the proceedings but such reviews will not be published before next autumn and I shall be out of this country until December so do not expect anything soon.

I am sorry you are not coming to Connecticut. Someday you will and we'll meet at last.

Cordially,
Jeanne Beaman
Bass harbor, ME 04653 USA

Letter from Jeanne Beaman, June 1976.

Analivia and the dance notation in 1973

M3x3, 1973

Considered the first work of Brazilian video art, remembering that there was no VHS video-recorder in Brazil at that time. Dancers were organized in a 3x3 matrix, the image were high-contrast, and movements were mechanical, resulting in a criticism to the computerized society.
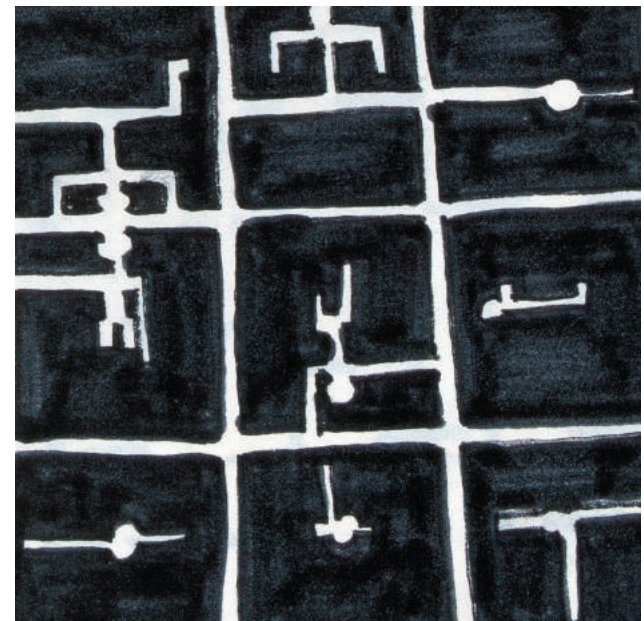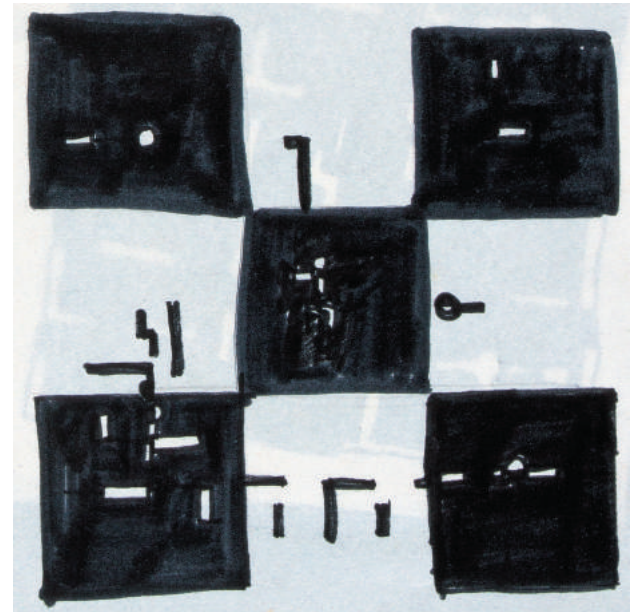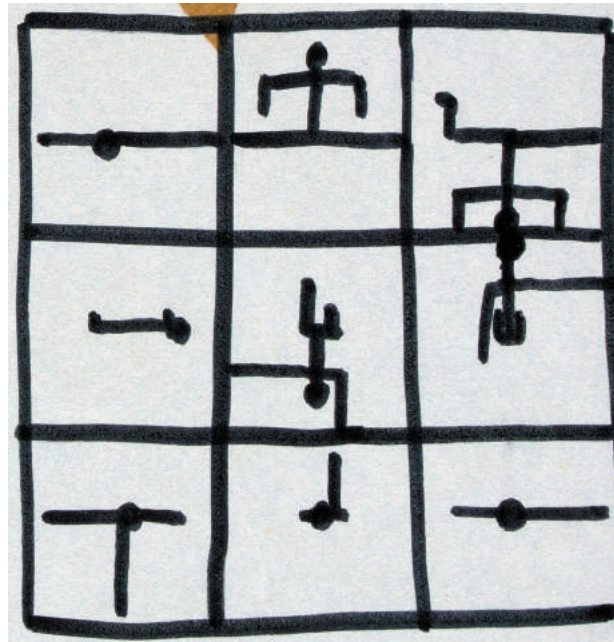
To watch the video, access

https://www.youtube.com/watch?v=EEGpBjT57lU

```
LPTSPL VERSION 4(125)  RUNNING ON LPT0
*START* USER ARTES  [20001,107] JOB  PROJET SEQ. 429 DATE 26-OCT-73 16:14:23 MONITOR UNICAMP 1070/506A  X4WD *START*
```

```
      SUBROUTINE KSOMA(A,N,M)
      DIMENSION A(7,7),B(7,7)
      DO 5 I=1,M
      DO 5 J=1,N
    5 B(I,J)=A(I,J)
      DO 15 J=1,N,2
      B(N+2,J+1)=B(N,J)
   15 B(N,J)=0
      CALL IMPR(B)
      RETURN
      END
      SUBROUTINE KSUBT(A,N,M)
      DIMENSION A(7,7), B(7,7)
      DO 5 I=1,M
      DO 5 J=1,N
    5 B(I,J) =A(I,J)
      DO 15 J=1,N,2
      B(N+2,J=1)=B(N,J)
   15 B(N,J)=0
      CALL IMPR(B)
      RETURN
      END
      SUBROUTINE KMULT(A,N,M)
      DIMENSION  A(7,7), B(7,7)
      DO 5 I=1,M
      DO 5 J=1,N
    5 B(I,J)=A(I,J)
      DO 15 J=1,N,2
      B(N+1,J)=B(N,J)
   15 B(N,J)=0
      CALL IMPR(B)
      RETURN
      END
      SUBROUTINE KDIV(A,N,M)
      DIMENSION A(7,7), B(7,7)
      DO 5 I=1,M
      DO 5 J=1,N
    5 B(I,J)=A(I,J)
      DO 15 J=1,N,2
      B(N+1,J)=B(N,J)
   15 B(N,J)=0
      CALL IMPR(B)
      RETURN
      END
      SUBROUTINE KTRAN (A,N,M)
      DIMENSION A(7,7),B(7,7)
      DO  5 I=1,M
      DO 5 J=1,N
    5 B(I,J)=A(I,J)
      DO 15 J=1,N,2
      B(J,I)=B(I,J)
   15 B(I,J)=0
      CALL IMPR(B)
      RETURN
      END
      SUBROUTINE KDET (A,N,M)
      DIMENSION A(7,7), B(7,7)
      DO 5 I=1,M
      DO 5 J =1,N
    5 B(I,J)=A(I,J)
```

Computer Program using
Fortran IV language

The drawings were created in order to explore
possibilities of video visual effect respecting the
dialogue between the scene and the human body.

Video recording of M3x3 at TV Cultura
de São Paulo studio, May 1973

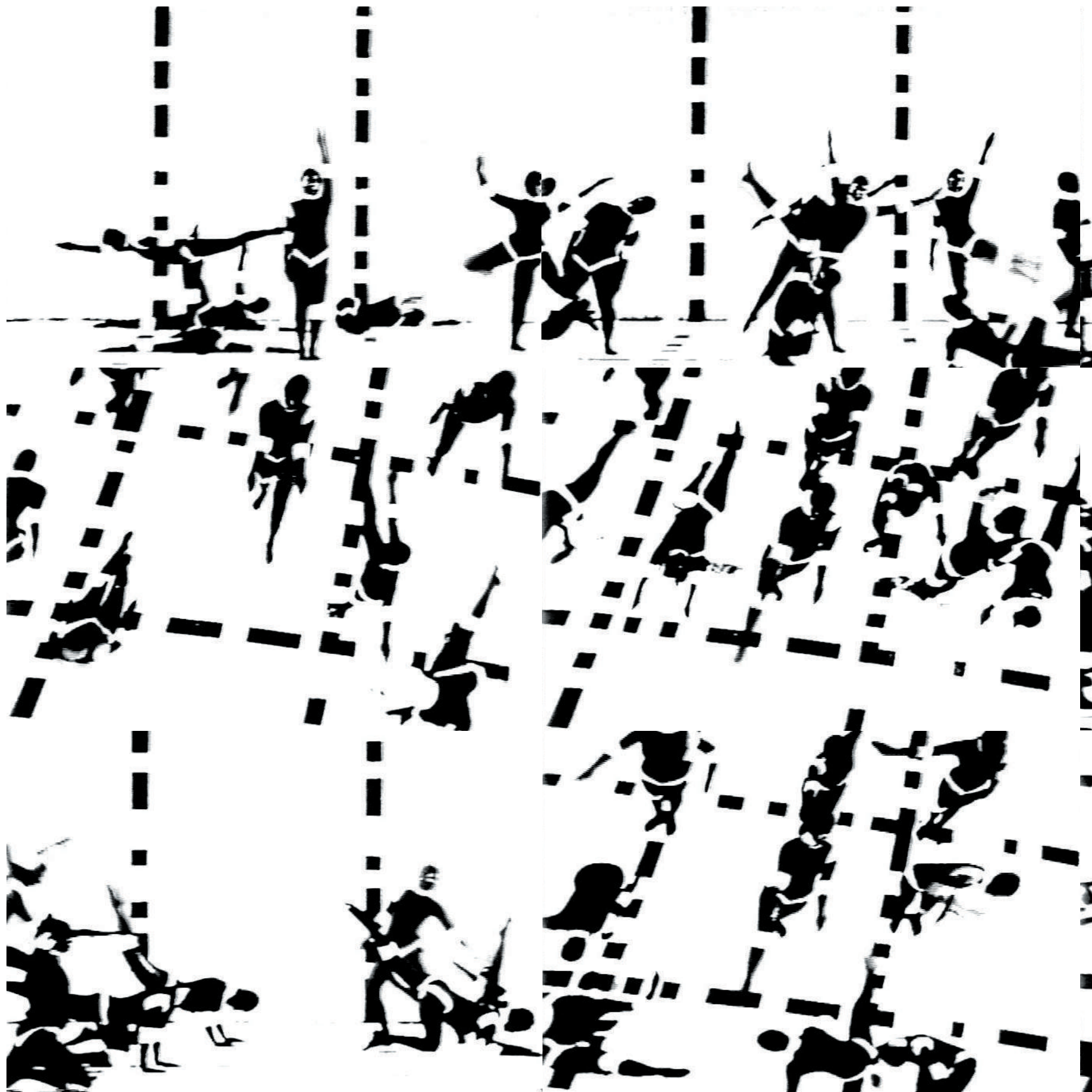Photo of the TV monitor showing M3x3 video at
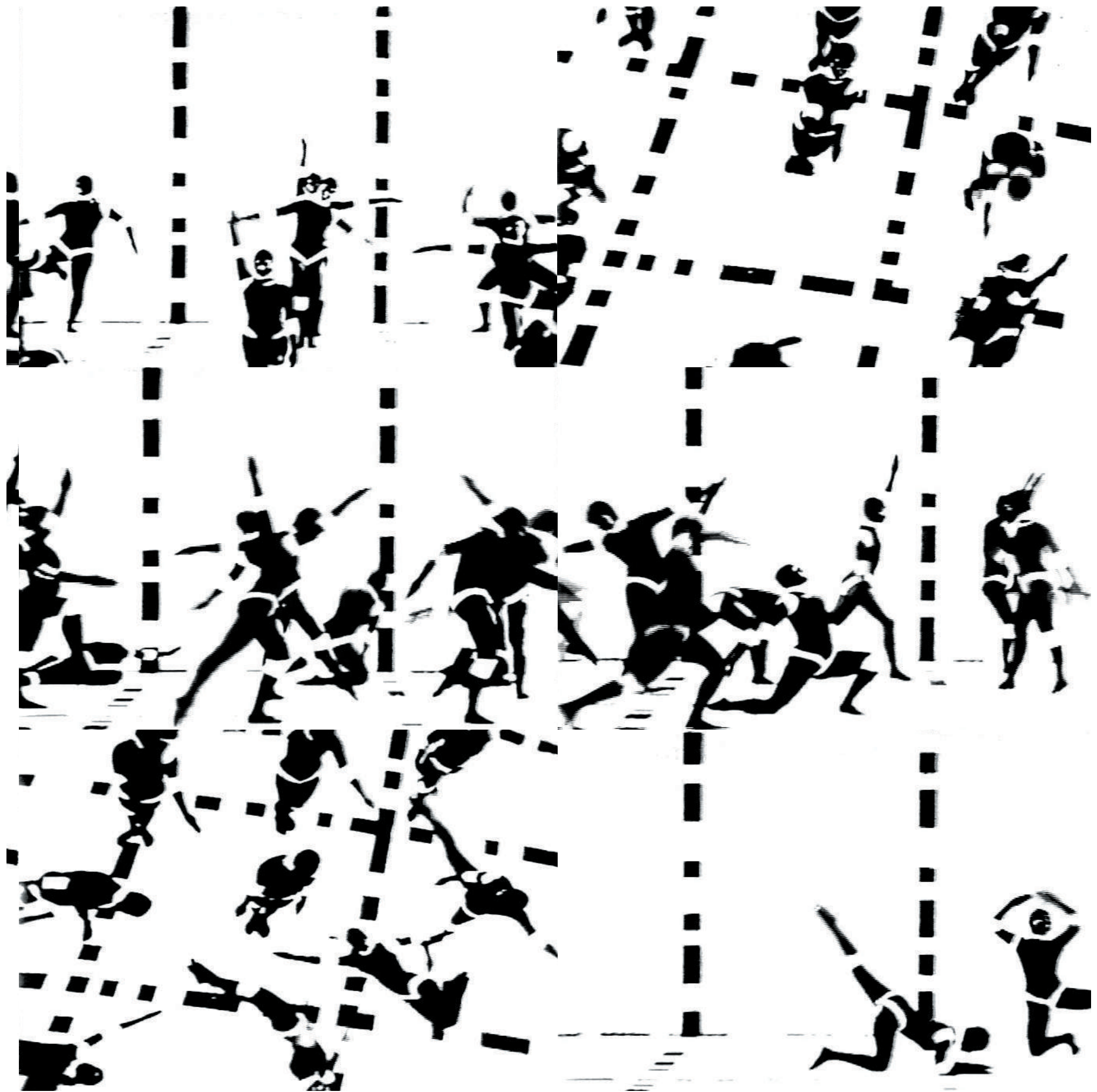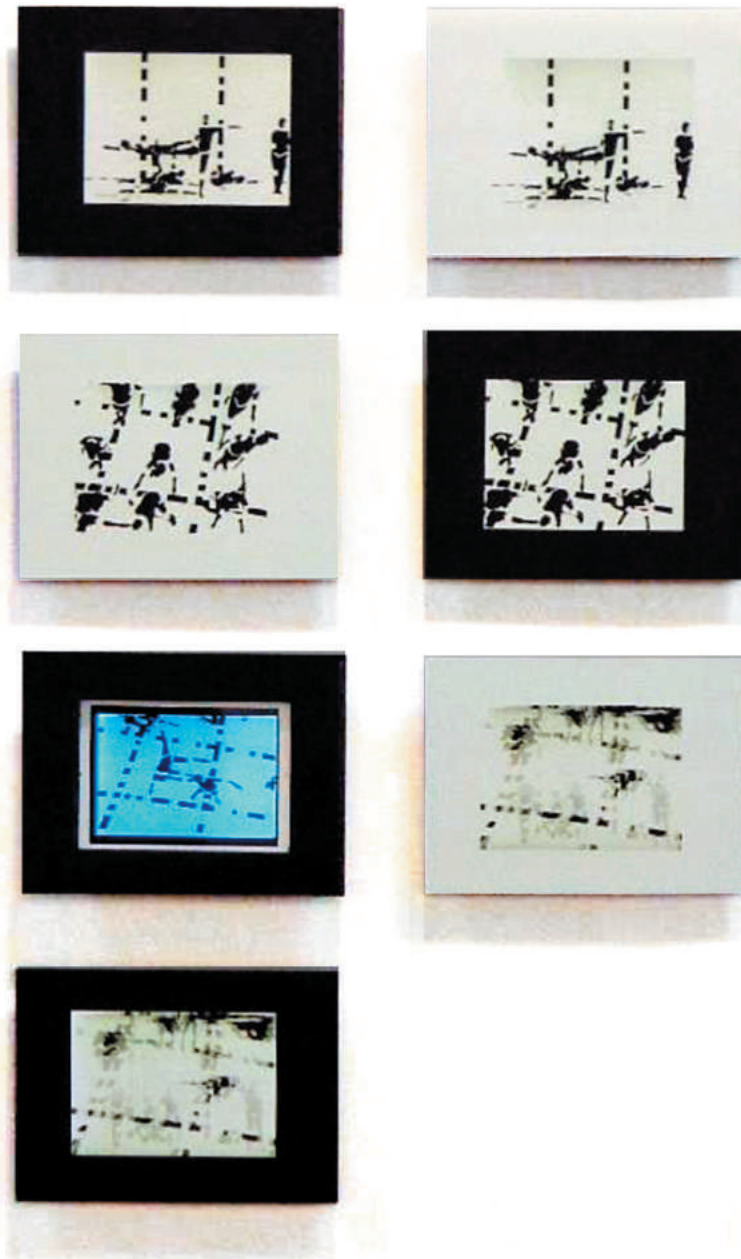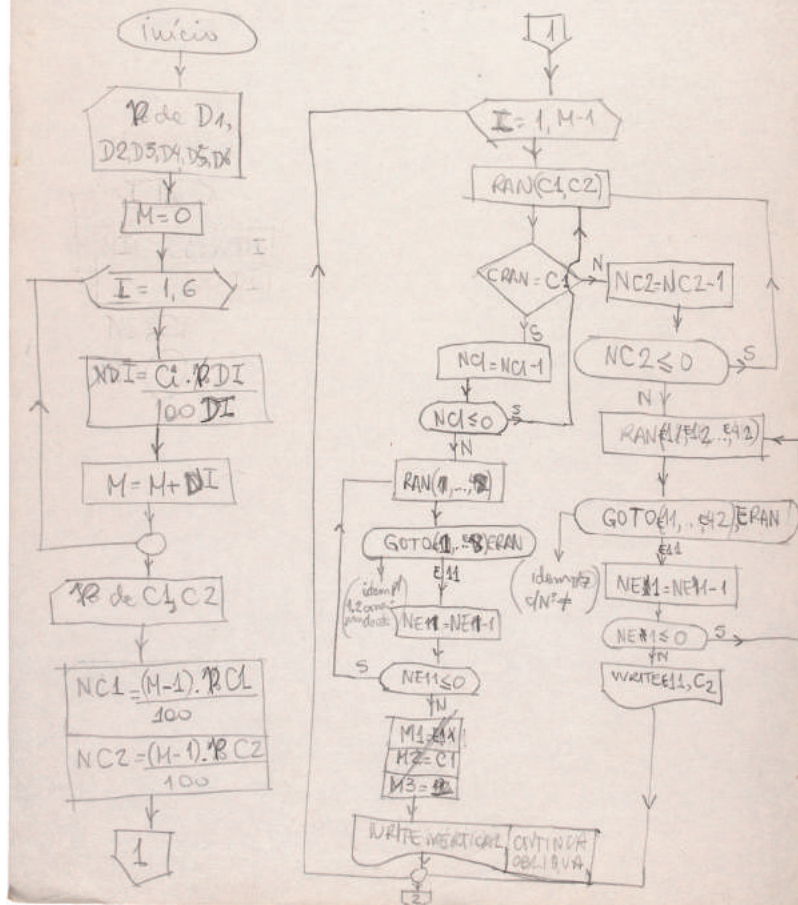TV Cultura de São Paulo in open TV network, 1973

Video frames

Installation M3x3 I, 2012
Printed frames and M3x3
video exhibited in a IPad

M3x3 INSTALLATION, 1973/2015

centro brasileiro de crítica de arte
01222-rua major sertório 88-5° conj. 52
são paulo sp
2000-rua marquês de são vicente 194 apto. 501
gávea rio de janeiro guanabara

8

DIAGRAMAS DE BLOCO

1-SUB-ROTINA DAS CAMERAS

Program flowchart

0°⟷ 45°, 1974

Images of the creative process


```
      SUBROUTINE CAMERA (   NC, TD )
      REAL TD(6),PD(6),NPC1,NPC2,NE(8),PE(8)
      INTEGER NUD(6),NUE(8),COMPAS(6),CORTE(2),ENFOCE(3,7)
      DATA COMPAS,CORTE/'1/3','2/3','1','2','3','4','CONTI','CORTE'/
      DATA IFIR2/1/
      WRITE(3,32)
32    FORMAT(1H1)
      GO TO (80,30),IFIR2
80    DO 99 J=1,7
      DO 99 K=1,3
99    ENFOCE(K,J)=' '
      CALL IFILE( 25,'NOMES')
      IFIR2=2
      READ(25,25,END=30)((ENFOCE(K,L),L=1,7),K=1,3)
25    FORMAT(7A5)
30    IFIRST=1
      X=720209.
      NTOT=0
      TYPE 2211
2211  FORMAT(' BATA NE,PE')
      READ(2,200) (NE(L),PE(L),L=1,8)
200   FORMAT (16G)
      TYPE1
1     FORMAT(' BATA AS PORCENTAGENS DE CADA TIPO DE DURACAO,E AS
     1PORCENTAGENS DE CONTINUA E CORTE, SEPARADOS POR / ')
      READ (2,2)(PD(I),I=1,6),NPC1,NPC2
2     FORMAT(8G)
      M=0
      DO 3 I=1,5
      NUD(I)=NC*PD(I)/TD(I)
3     M=M+NUD(I)
      NUD(6)=NC-M
      M=NC
      IF(NPC1-1)11,12,12
12    IRAN2=1
      GO TO 81
11    IRAN2=2
81    DO 4 I=1,7
      NUE(I)=NE(I)*M
4     NTOT=NTOT+NUE(I)
      NUE(8)=M-NTOT
      IRAN4=0
      DO 5 I=1,M
6     IRAN1=RAN(X)*6+1
      IF ( NUD ( IRAN1 ) .EQ. 0 ) GO TO 6
      NUD ( IRAN1 ) = NUD ( IRAN1 ) - 1
      NCO=0
10    IRAN3=RAN(X)*3+1
      IF ( NUE ( IRAN3 ))15,15,14
15    NCO=NCO+1
      IRAN4=IRAN3
      IF(NCO-2)14,13,5
14    IF(IRAN3.EQ.IRAN4)GO TO 10
      IRAN4=IRAN3
13    NUE ( IRAN3 ) = NUE ( IRAN3 ) - 1
5     WRITE(3,31)COMPAS(IRAN1),CORTE(IRAN2),(ENFOCE(IRAN4,K),K=1,7)
31    FORMAT(1X,A3,' DE COMPASSO = ',A5,5X,7A5,/)
      RETURN
      END
```

Video camera subroutine computer program using Fortran IV language

```
PULOS
REDONDO
    1    6    1    1    4    5
    5    1    1    1    4    3
    4    5    1    1    4    5
    3    5    1    1    1    2
    4    1    1    1    4    2
PULOS
HORIZONTAL-VERTICAL
   17   12    6    2    2    3
    3    6    7    7    1    3
    3   17    5    6    1    2
    9   14   12    1    1    4
   17   18    1    3    1    2
PULOS
REDONDO
    2    4    1    1    4    1
    6    6    1    1    1    4
    1    2    1    :    1    4
    6    :    1    1    1    4
    6    3    1    1    1    2
```
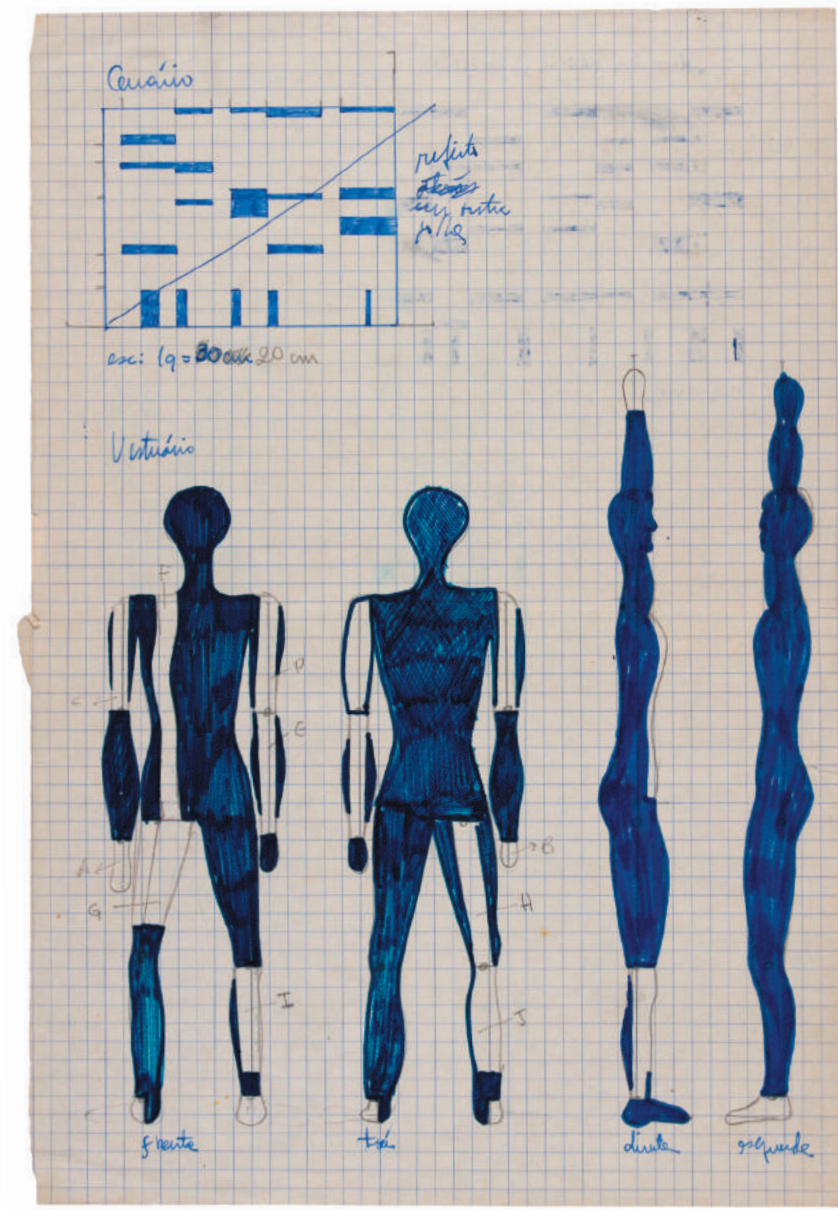
```
QUEDAS E/OU LENTOS
HORIZONTAL-VERTICAL
   14   12    9    4    4    2
   12   14   10    1    4    3
   16    7    8    5    1    2
    9    2    5    4    1    1
   12    1    3    7    4    2
QUEDAS E/OU LENTOS
HORIZONTAL-VERTICAL
   14    5   12    1    4    1
   17    7   12    2    3    2
   17   14    5    6    1    2
    2   18    3    6    1    2
    7   1Ø   11    7    1    1
```

Computer output of body positions vector. The numbers in sequence
correspond to right leg, left leg, right arm, left arm, trunk, head

0°↔45° dance notation drawing from 1984

Costume

0°↔ 45° Version I, 1974

Images of the creative process

Chromatic possibilities drawings for the video 0°↔45° Version I
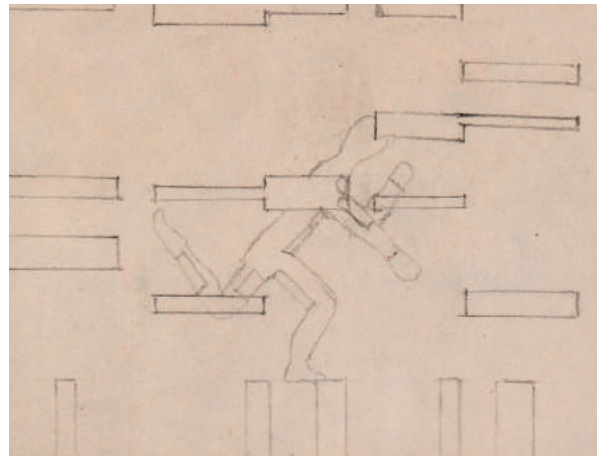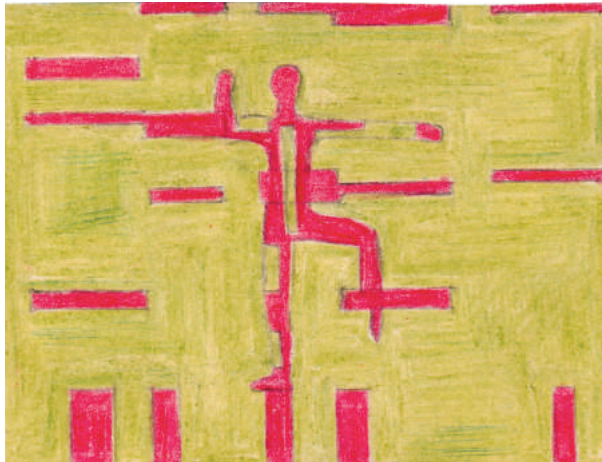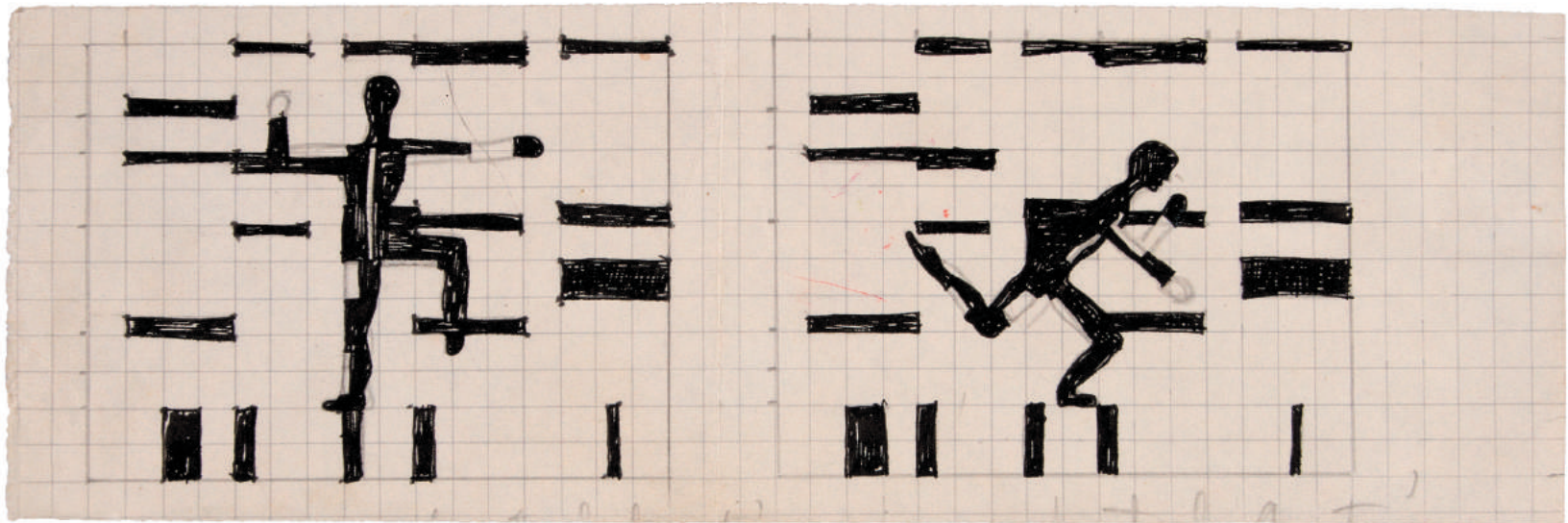
Chromatic possibilities drawings for the video 0°↔45° Version I
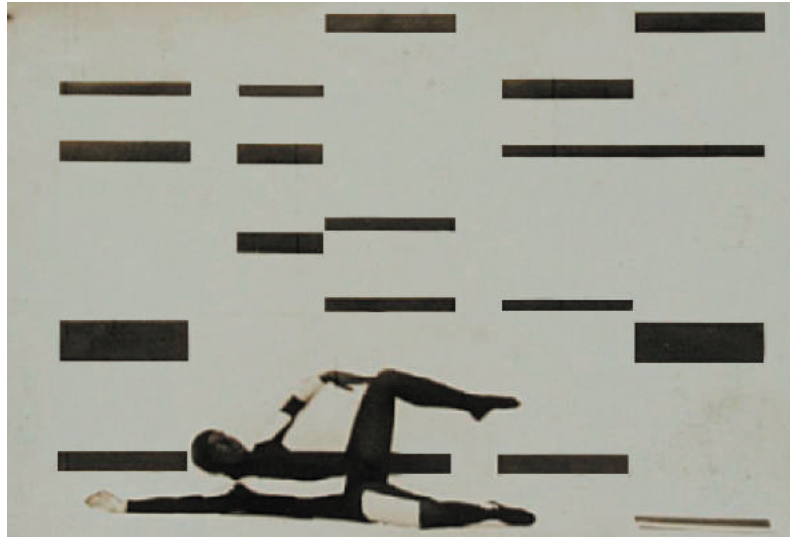
0°↔45° Version I – video image (lost video)
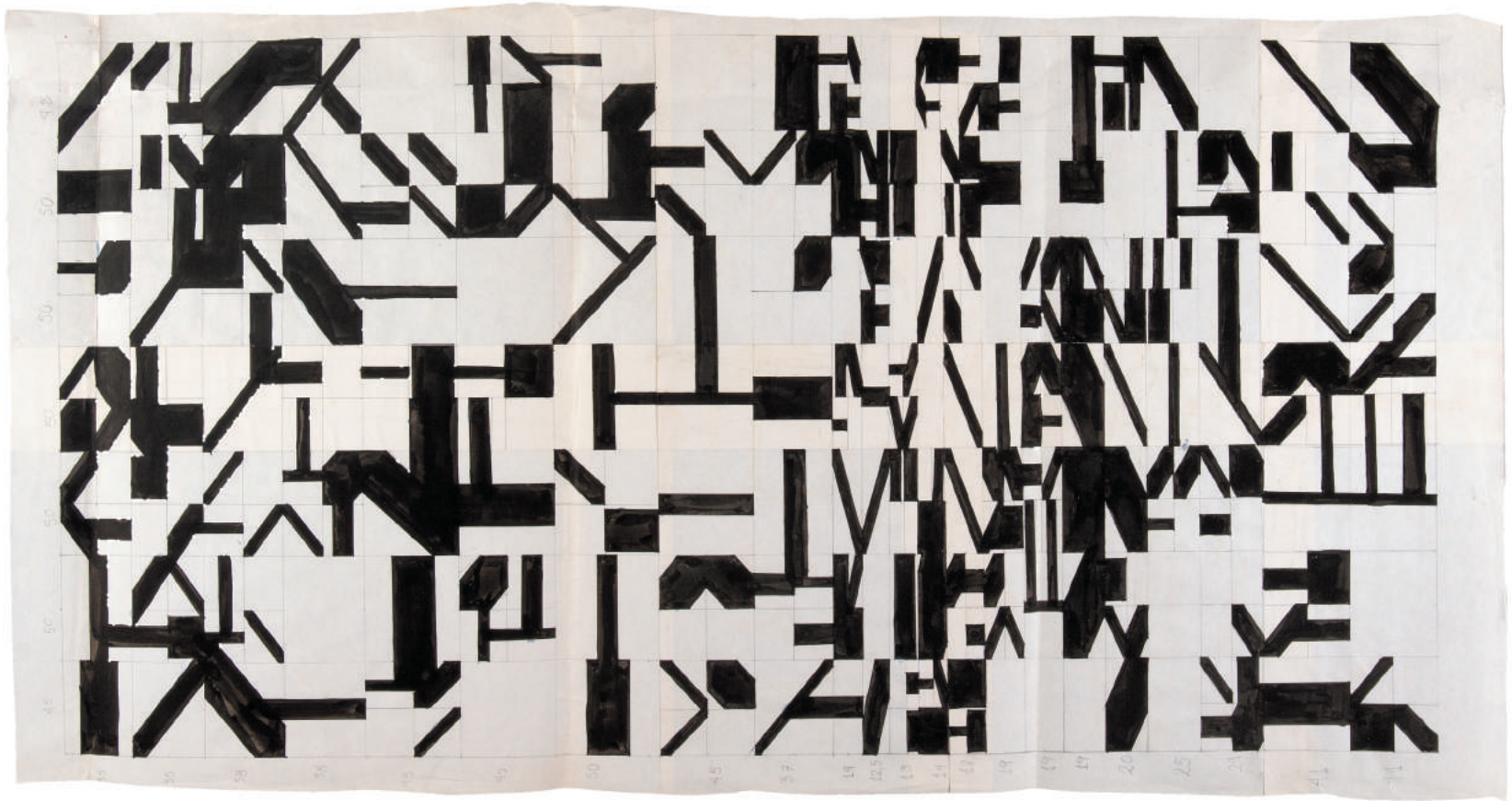
0°↔45° Version II scene
Image of the creative process

0°↔ 45° Version I, 1974

A solo where the dancer merges with the scenario while performing rounded or diagonal movements. The scenario is made up of diamonds and black rectangles and a sequence 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.

To watch the video, access

https://www.youtube.com/watch?v=N0Qd4MjgLJY
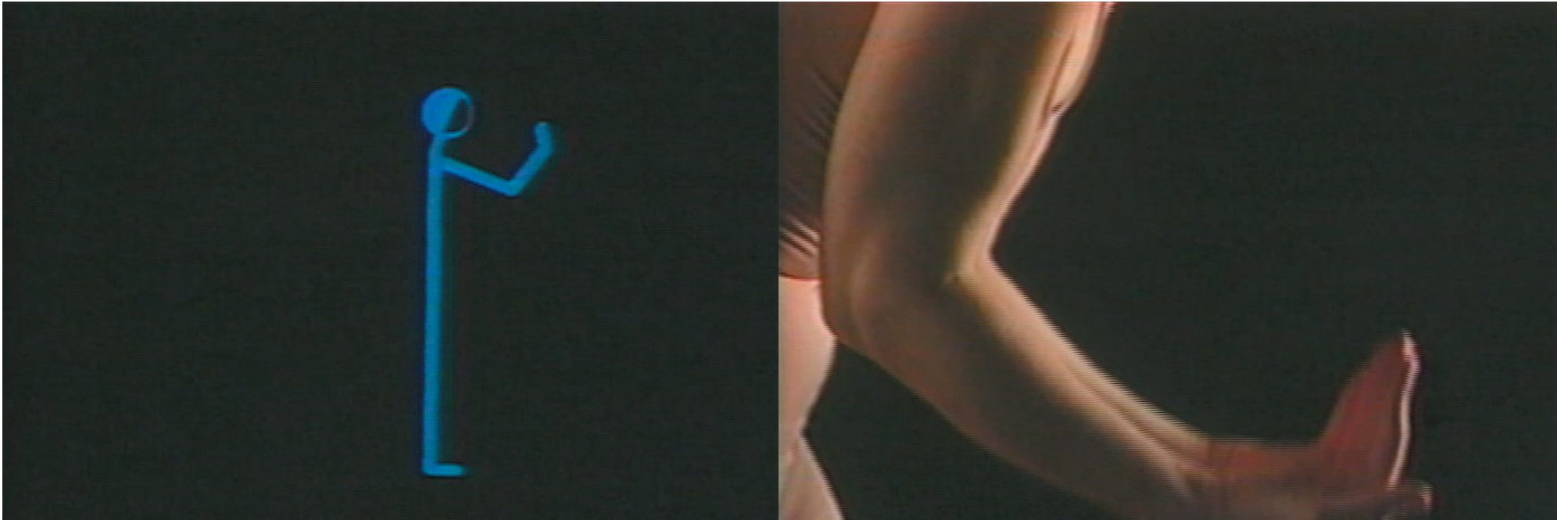
Video images

Video images

0°↔ 45° Version II, 1974/1989

0°↔45° 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.

To watch the video, access

https://www.youtube.com/watch?v=R3QNsQeiqTw
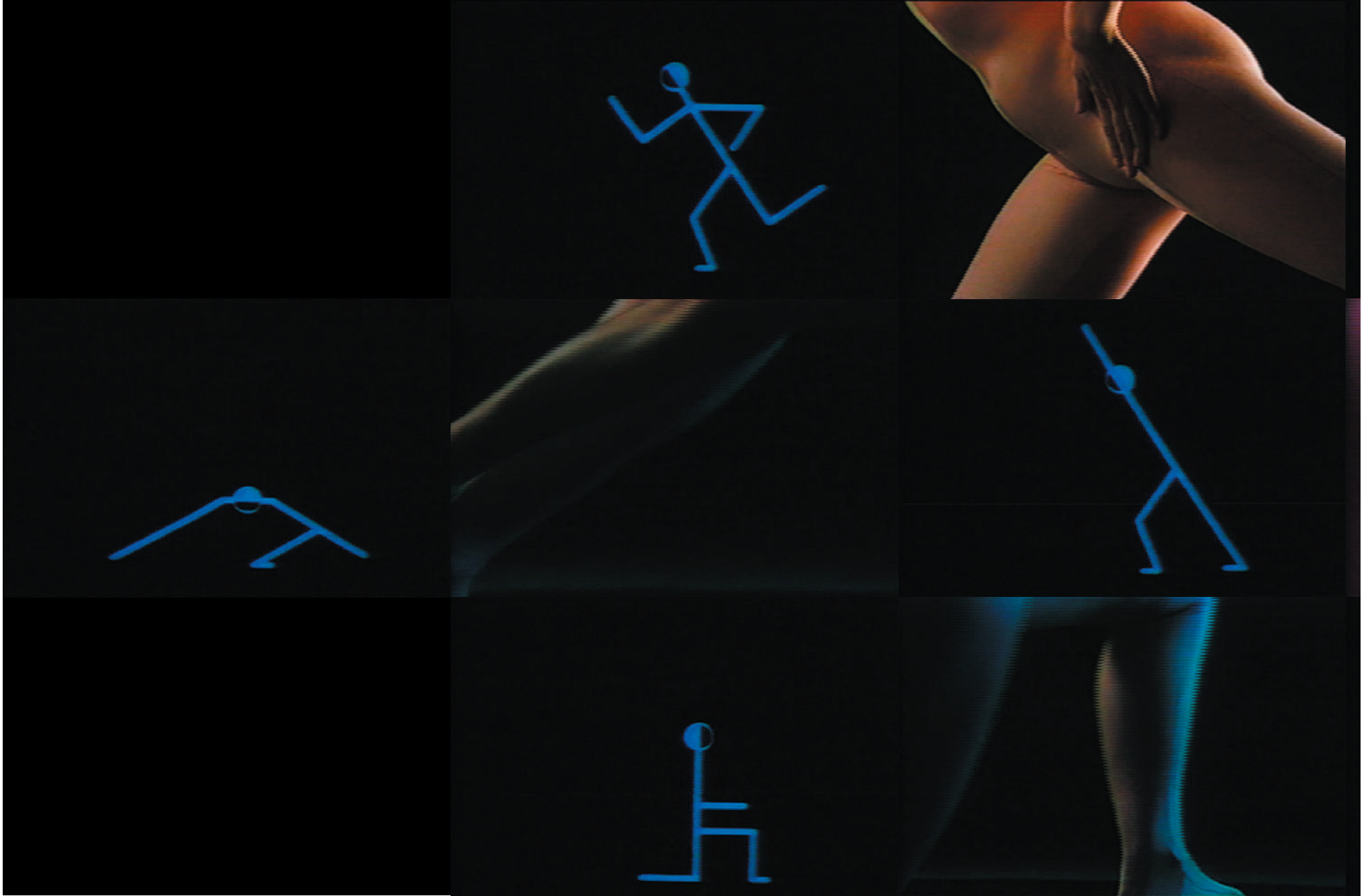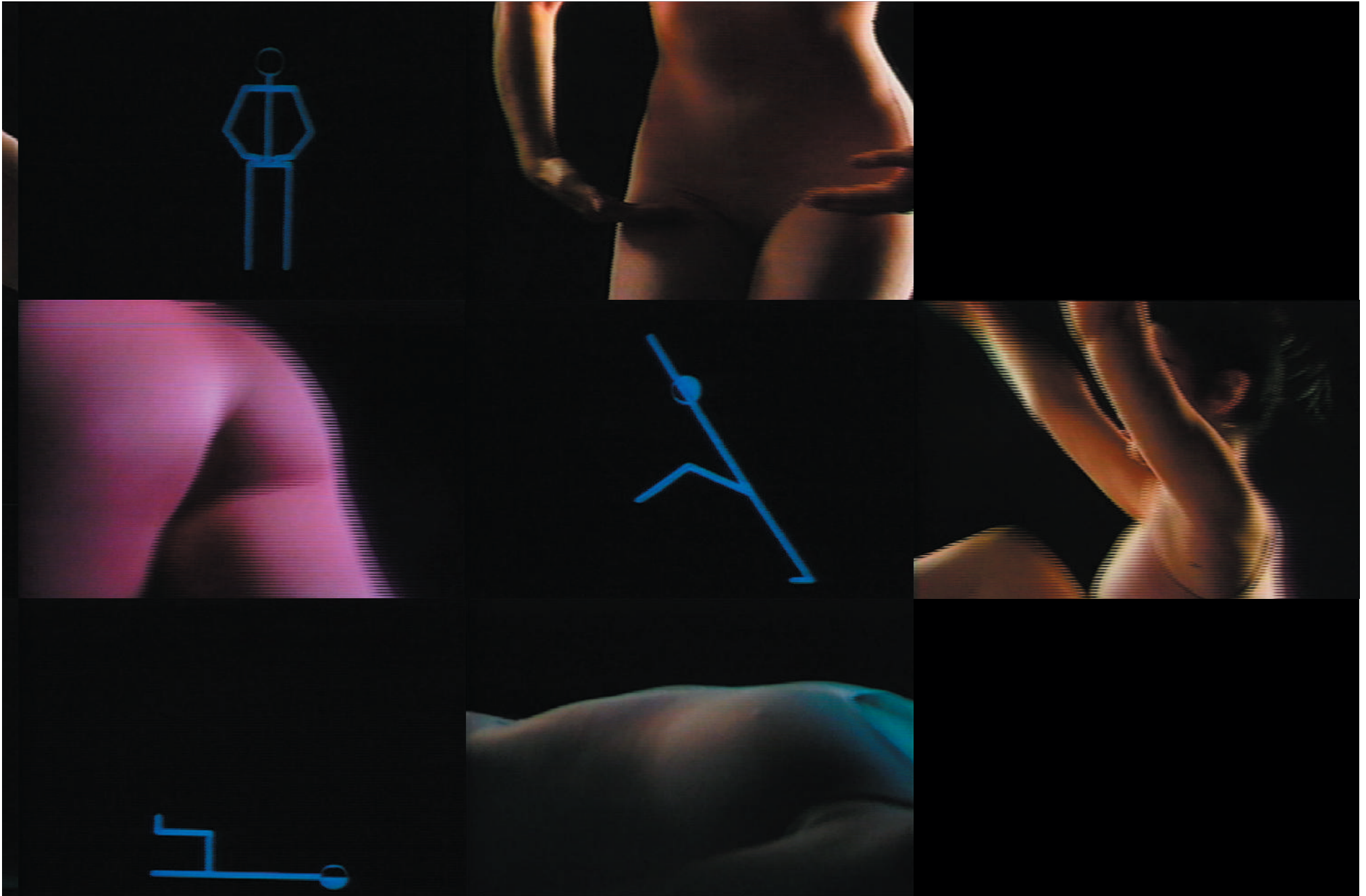
GESTURES, 1975

The positions of the dancers' body were taken randomly from newspapers and magazines pictures, questioning the drama while showing that our daily life can be seen as pieces of a puzzle.

To watch the video, access

http://youtu.be/vLJZ0HW7h5o

CAMBIANTES, 1976

A computer dance composed by movements based on 45 degrees and right angles made by the body limbs positions during the choreography. The black and white scene is a unit obtained through the visual union between the dancers' costumes and the scene. The scene is composed by drawing body parts in black on a white background.

Together with drawings of body parts, black triangles are placed on the edges of the scene. Using high contrast black and white images, the rectangular space of the video screen is cut merging into other forms. So, when the video is displayed in a dark video monitor or in a dark room, the screen image becomes an irregular polygon. This visual result conceals the rectangular bi-dimensional space of the video projection with the black triangles that penetrate in the dark room space, remembering that video projection rooms were like the movie theatres in the beginning of video-art. Thus the dance is like a moving scene made with the dancers' bodies in black and white.

Musical scores with choreography notes

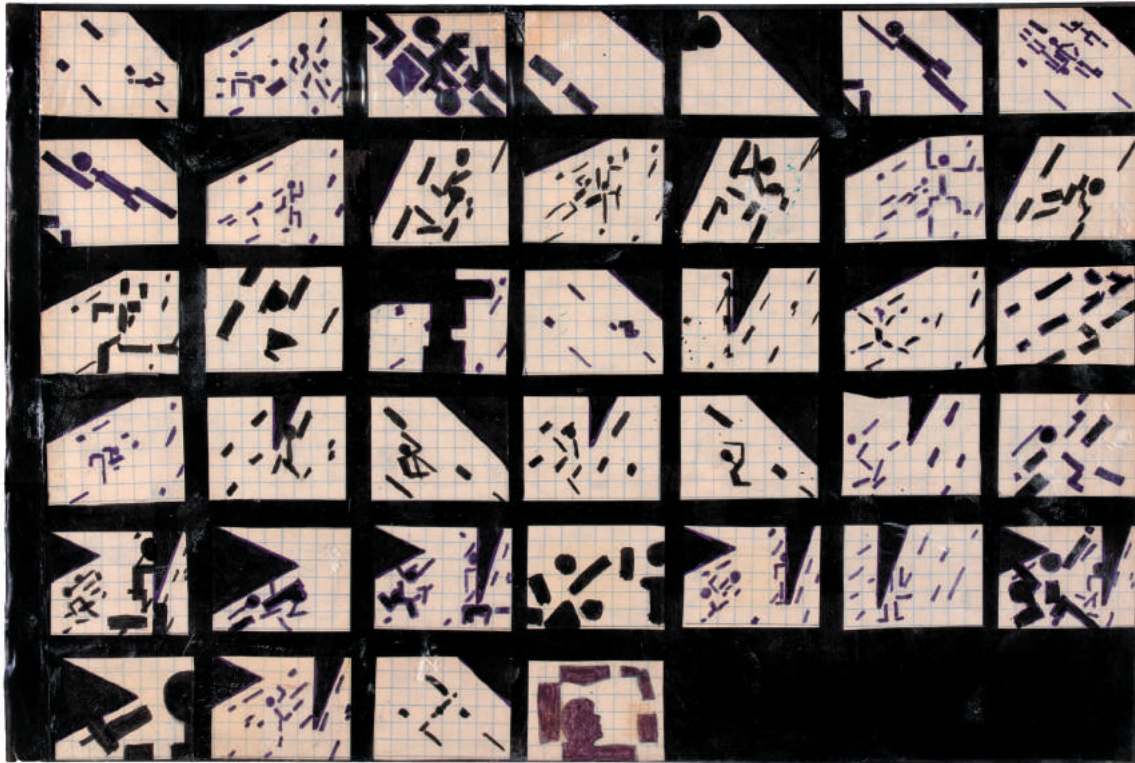Flow chart dancers in and out video scene

Scene Project

Costume design

```fortran
      SUBROUTINE ESPACO
      COMMON KOE(5,6,4),P(7,3),II,KT(4),TE(5,23!),IRAN2,KN,IRAN(1
     1 ),NDA(2,3),JN,M1(4),MES(4),NPES(4)
      REAL T(4),NPT(4),NPID(4)
      INTEGER ND,NP,ID(4),TT,NT(4),NID(4),N(4),M(4),MI(6)
      OPEN(UNIT=2,DEVICE='DSK',FILE='DADOS.ESP',ACCESS='SEQIN')
      READ(2,100)(T(K),K=1,4),(NPT(K),K=1,4),(ID(L),L=1,4),(NP
     1 ID(L),L=1,4),TT
100   FORMAT(17G)
      MN=0
      DO 10 K=1,4
C     CALCULO DO NUMERO DE CADA TEMPO DE ACORDO COM A %
      NT(K)=TT*NPT(K)/T(K)
10    MN=MN+NT(K)
      MN1=0
C     CALCULO DO NUMERO DE CADA DESLOCAMENTO DE ACORDO COM %
      DO 20 L=1,3
      NID(L)=TT*NPID(L)/ID(L)
20    MN1=MN1+NID(L)
      NID(4)=MN+MN1
      DO 30 ND=1,5
      I=1
      WRITE(3,98)ND
98    FORMAT(' DANCARINO',1X,G,/)
      DO 40 K=1,4
40    N(K)=NT(K)
      DO 50 L=1,4
50    M(L)=NID(L)
C     ORDENACAO DOS TEMPOS E DESLOCA/OS CALCULADOS
51    IRAN1=RAN(X)*4+1
      IF(N(1).EQ.0.AND.N(2).EQ.0.AND.N(3).EQ.0.AND.N(4).EQ.0)GOTO 52
      IF (N(IRAN1).EQ.0) GO TO 51
      N(IRAN1)=N(IRAN1)+1
      TE(ND,I)=T(IRAN1)+1
      I=I+1
      WRITE(3,99)T(IRAN1)
99    FORMAT(' DESLOCA/O',1X,G,1X,' TEMPOS',/)
      GO TO 51
52    IRAN2=RAN(X)*4+1
      IF(M(1).EQ.0.AND.M(2).EQ.0.AND.M(3).EQ.0.AND.M(4).EQ.0)GO TO 30
      IF(M(IRAN2).EQ.0) GO TO 52
      M(IRAN2)=M(IRAN2)+1
      WRITE(3,101)ID( IRAN2)
101   FORMAT(' DESLOCAMENTO',1X,G,1X,' PONTOS',/)
      GO TO 52
30    CONTINUE
C     DISTRIBUICAO DAS LINHAS DE DESLOCA/O P/ CADA DANCARINO
      DO 60 NM=1,5
      WRITE(3,201) NM
201   FORMAT(' GRUPO',1X,G1,1X,' DAS LINHAS DE DESLOCA/O',/)
      M1(1)=0
      DO 60 MN=1,5
72    IRAN3=RAN(X)*5+1
      DO 80 MI=1,MN
80    IF(IRAN3.EQ.M1(MI)) GO TO 72
      M1(MI+1)=IRAN3
60    WRITE(3,103) MN,IRAN3
103   FORMAT(' LINHA DE DESLOCA/O DO DANCARINO',1X,G1,1X,G2,/)
      RETURN
      END
```

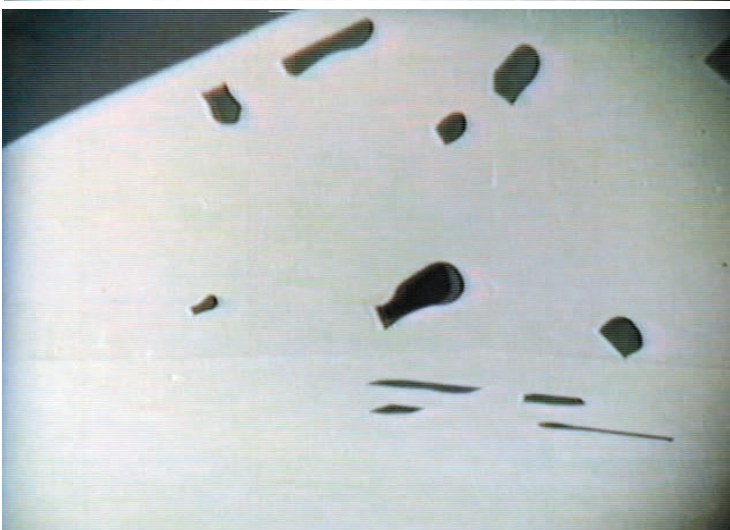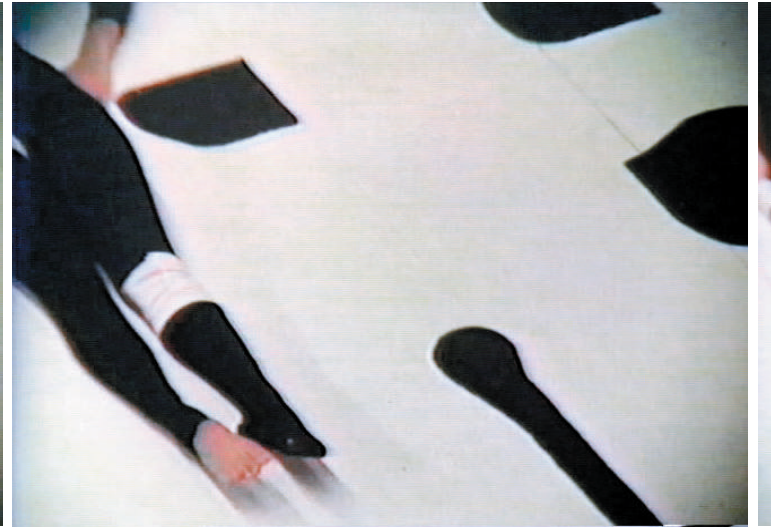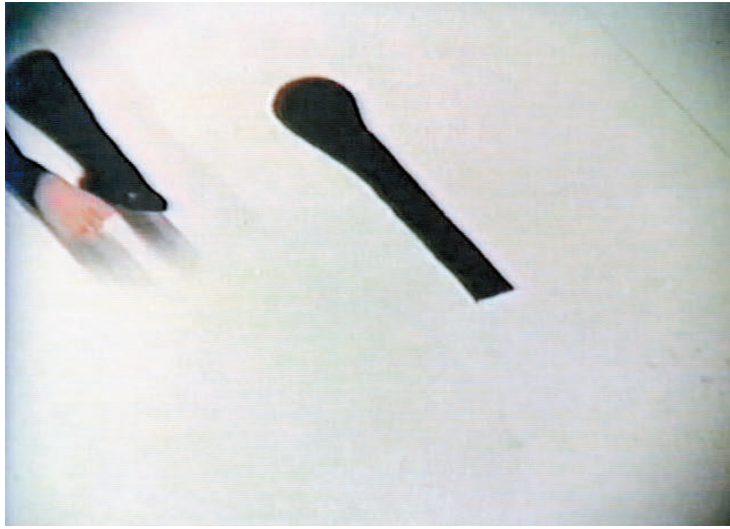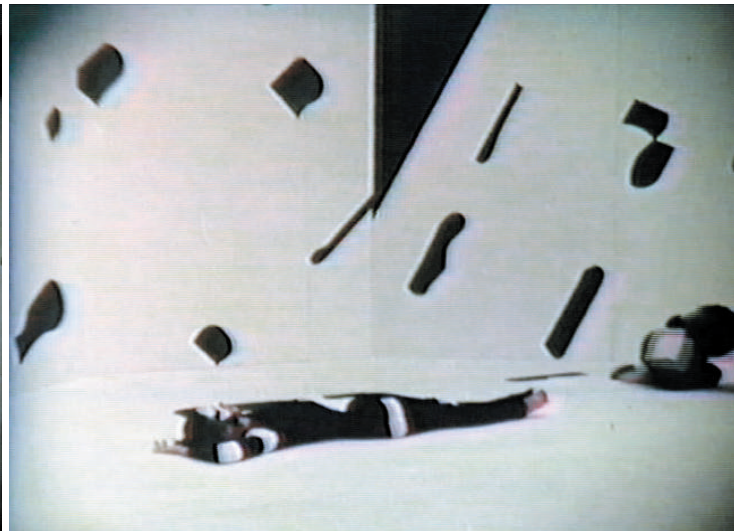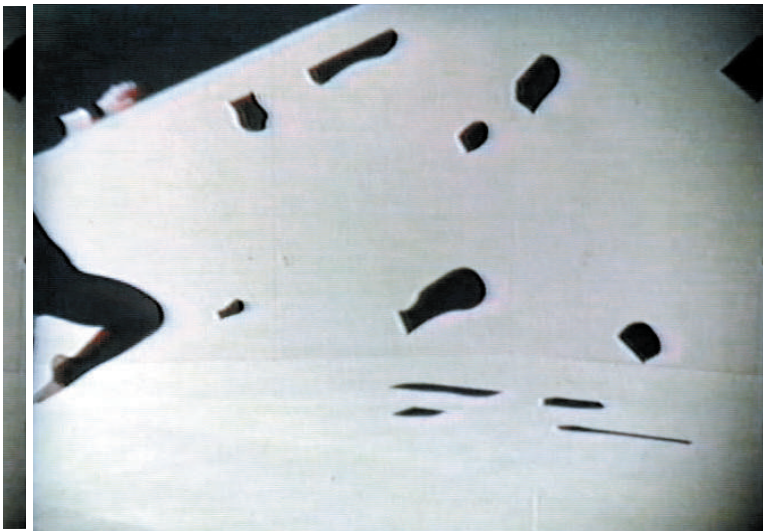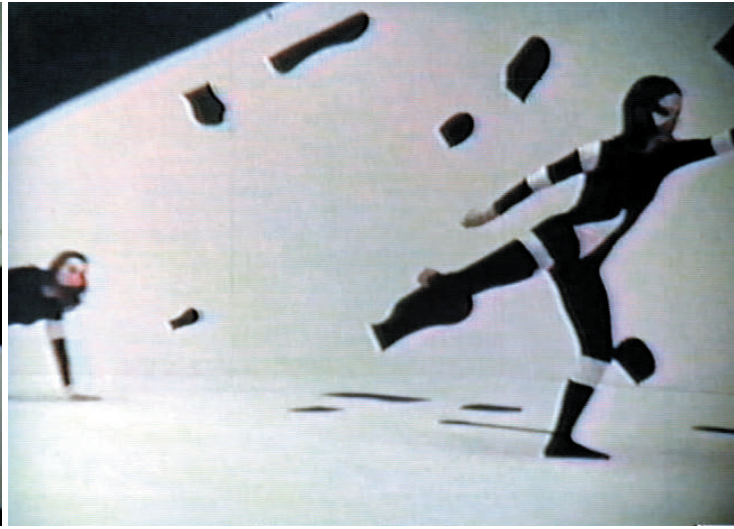Subrotine space computer program in Fortran IV language

Frames drawing (left)

At the dressing room
before the video recording
Photos: Pedro Farkas

Cambiantes Version I – video images

To watch the video, access

https://www.youtube.com/watch?v=Bj4odx96110
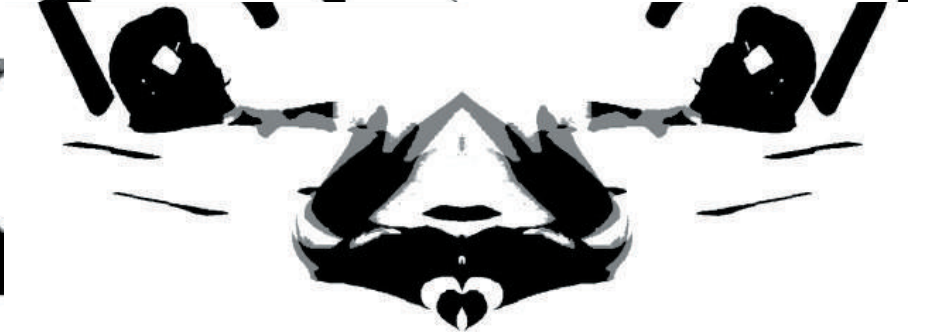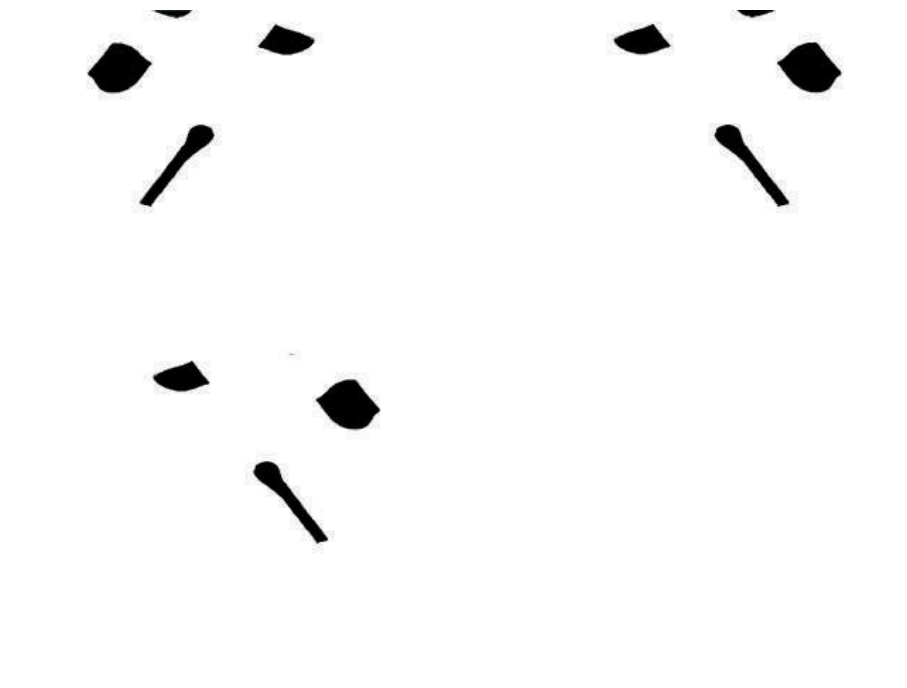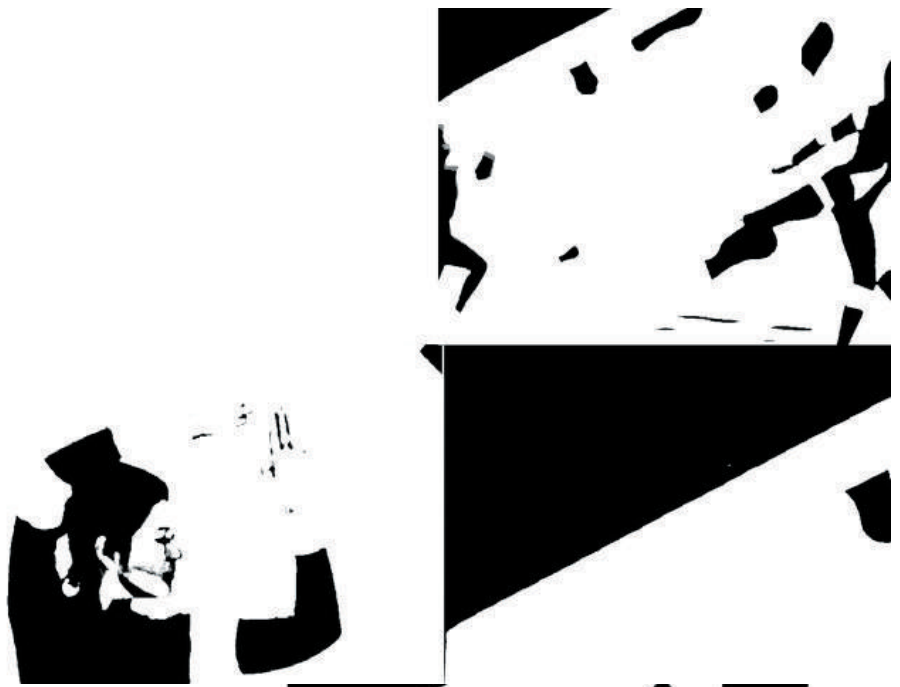
Cambiantes Multiple Version

Cambiantes All Multiple Version

To watch the video, access

https://www.youtube.com/watch?v=apenSFjopgY

Manual computer decodification of dancers movement

Dancers displacement

Computer output of dancers movement
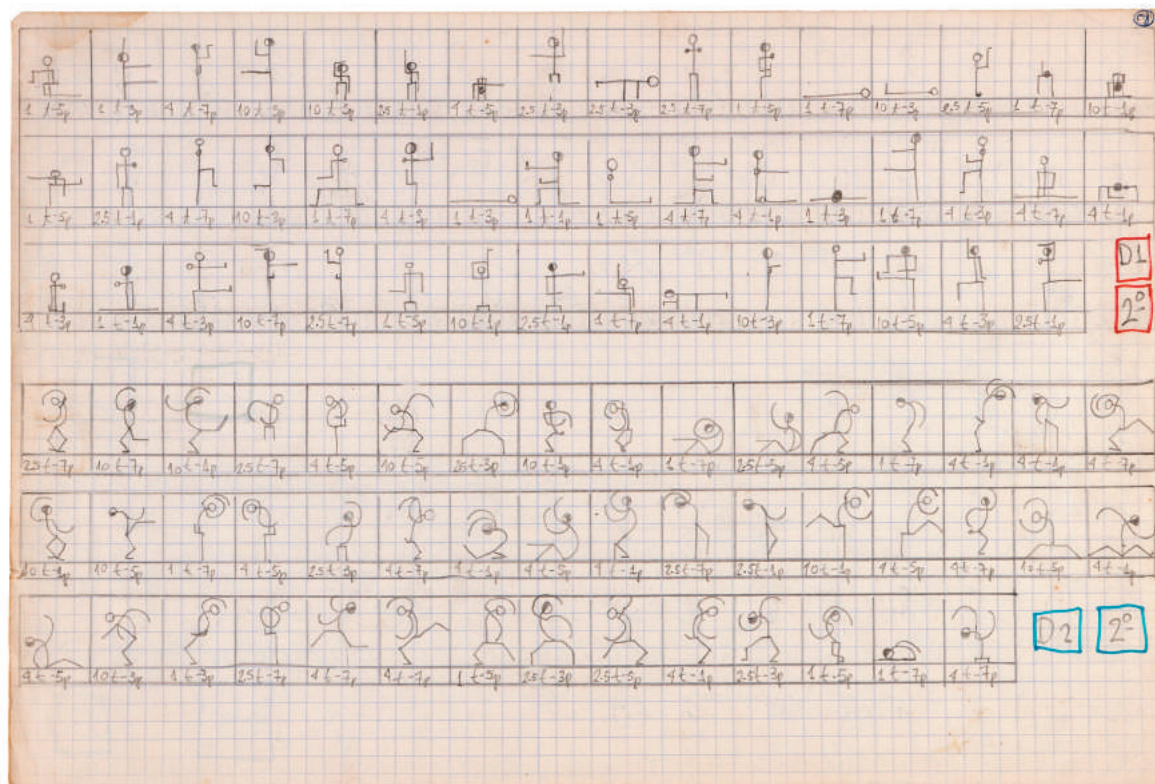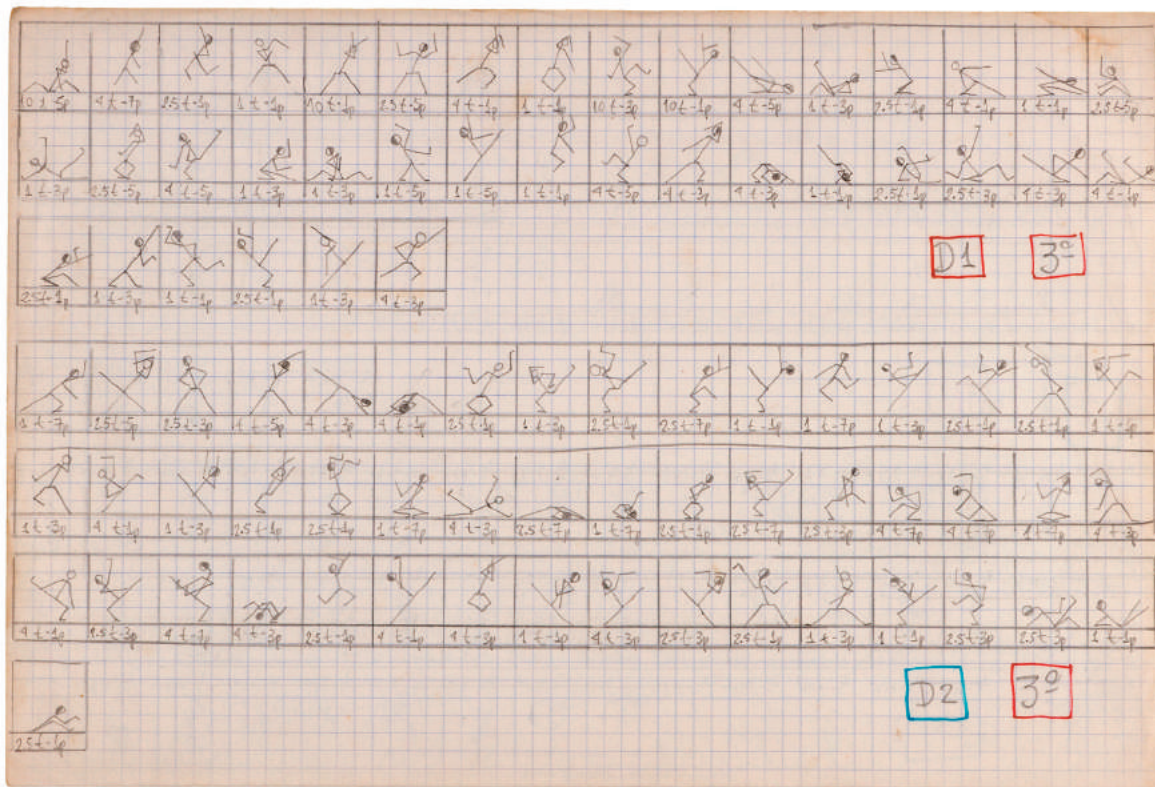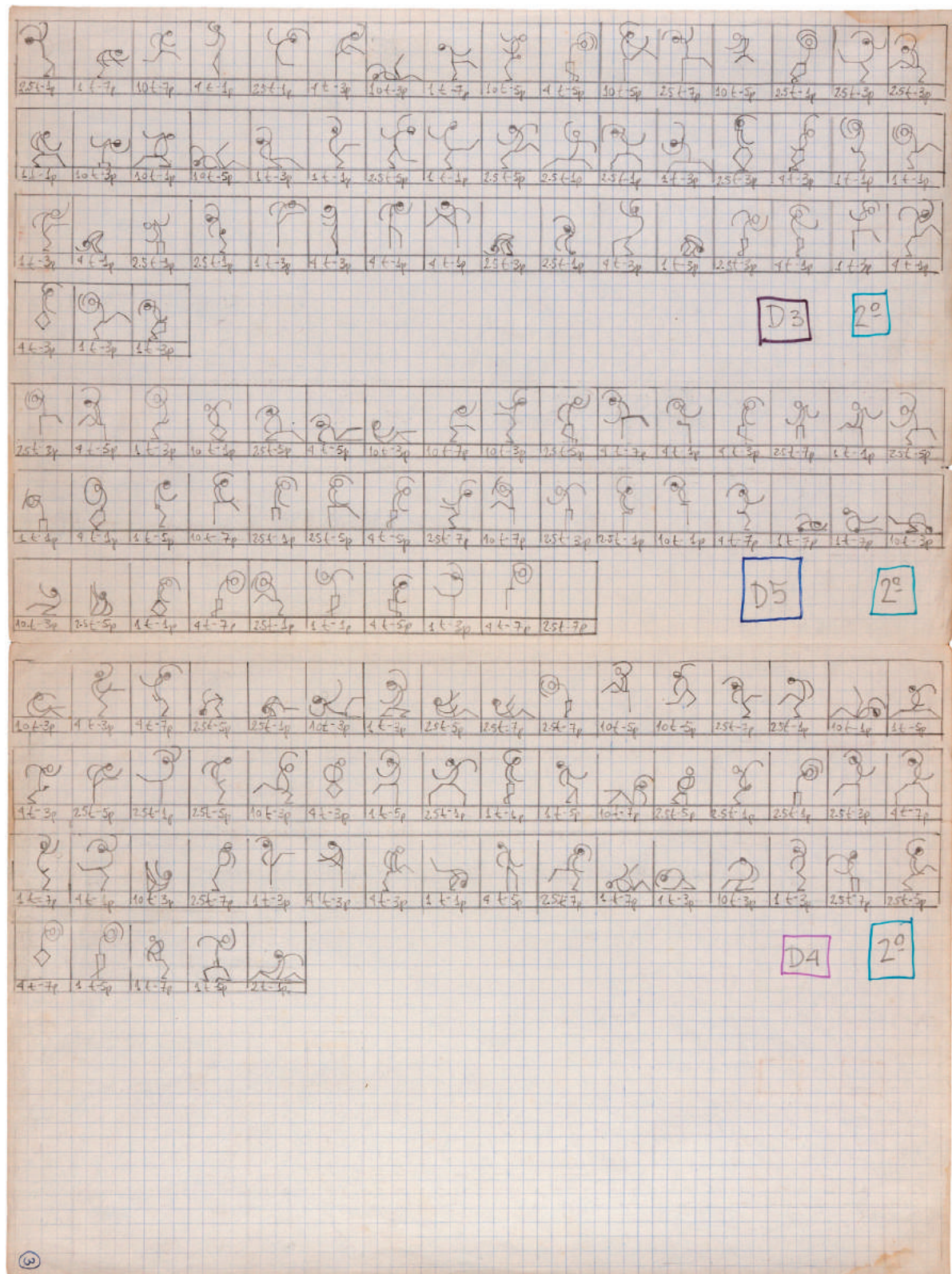
Manual computer
decodification of dancers
movement

2 VIDEOS AND PERFORMANCES

Video recorded dances were made after the period of computer dances 1977 until 2009 . They were produced with handheld cameras always researching the relationship of body and video language. Thus, a videodance never must be reproduced on stage because it is made to be seen through recorded images.

ARLINDO MACHADO

BODY AS A CONCEPT OF THE WORLD

Analivia Cordeiro is a pioneer in Brazil in some areas of electronic arts and performance, speci cally in video art, videodance, computer dance, performance and body art. Unless any other interpretation comes up, the oldest tape admitted as belonging to the history of Brazilian creative video, stored and accessible for viewing today, is the M3x3 actually a video for choreography, designed for the Edinburgh Festival and recorded with the technological resources of TV Cultura in São Paulo in 1973. Therefore, an unorthodox chronology of Brazilian video that begins with this pioneering work has allowed to celebrate in 2003, the thirty year history of the Brazilian video and in two more years the forty anniversary

Although she is the daughter of one of the greatest Brazilian visual artists of the twentieth century, Waldemar Cordeiro, and still is responsible for his work, Analivia personally followed a career very different from his father's career, more directed to issues of body and theatrical performance. Two questions are basic in all her work as artist: the relationship of the body with its surroundings and the gesture as primordial expression of man, which can be summed up in the idea of embodiment. Whereas for much of contemporary science, cognitive activities of man are inseparable from his body, embodiment relates to the body not only in the physiological sense of the term, but as a presence in the world, which is a precondition of subjectivity and interaction with the surroundings. In other words, embodiment is the body understood as an interface between the subject, culture and nature.

In recent years, several studies in the fields of science have shown that the body is not just a wrapper that holds the internal organs. As an interface, it is our contact device with the world, is through him that we perceive the world we hear, we see, we touch, and is also through him that the world perceives our presence as an individual. For each one of us, it is the device of dialogue between the inner and outer, between what we are on our physiology and subjectivity and what makes us part of the world, with its hardships and graces. In addition, the body is our primary means of communication, even prior to verbal language. It is an universal language, possibly our first language, which dispenses any instrument external to the body. Just remember that when we are in a country whose language they do not understand, nor master, the body functions as a language naturally and easily understood by all. The gesture, the waving hands, the expressive movement of the body, writhing, jumping and falling, when performed with intention, are the ways in which the body thinks, as the body speaks , shapes the feelings and communicate those thoughts and these emotions to other bodies, which also react to it.

83

The difference introduced by Analivia in their creative work with the body is the actualization of this possibility and this awareness through the incorporation of contemporary technologies video, computer, electronic projection etc. which enhance the results. M3x3, as explained above, is possibly both the rst Brazilian video art as videodance at that stage still in black and white and consists of a complex choreography that takes place in a Concrete and abstract scenary, where the movements of the dancers are broken in quick and stiff gestures, already anticipating the break dance and the intervention of the rst electronic groups like Kraftwerk and Devo, among others. Everything is of a severity that we would now call constructivist , that Analivia would rethink in later works, thinking it more organic. But it is a rst Brazilian attempt of think the language of video and how the issue of body interacts with the electronic art.

In Unsquare Dance, performance and video based on the song of the same name by Dave Brubeck and using a software by Luiz Velho, she dances with electronic markers that sends information to an infrared camera and those informations are processed and interpreted by a speci c software that generates lines of movement, projected on a screen in real-time. The body, almost dancing in the dark, generates computer images that function as mandalas synthesizing the geometry of body movement.

The series Flesh is composed of dances entirely reinterpreted by the video. Unlike the theatrical performance, in which the dancing body and the background are seen all at once, the video suggests what should be seen at all times, and that video interpretation is decided by the clipping of the frame and also by the effects assembly in this case, mergers and / or additions of Cummings's poems through a character generator , all with under the music of Rodolpho Grani Jr. or Rach-

maninov, with overlays of guttural noises, growls and voices. The body of the dancer is, in a metaphorical sense, cut and we only see, at every moment, eyes, hair, breasts, ngers, mouth and other parts unrecognizable due to the extremely closed frame of the camera. The result is of an extraordinary poetic because the body expressiveness is in a dialogue with technology sensitive to it the basis of all the audiovisual language, since the time of Grif th, is the close up, the detail of the body . The images are of extreme intimacy and the dif culty of seeing for lack of visual context often stimulates the viewer's reading, which ranges between a gurative or abstract approach. The innovative detail is that the ballerina herself Christina Brandini in one version or Analivia in another one handles the camera, looking for a match between their improvised movements and the camera reading of them. Analivia calls this way of working video-choreography, where the camera and the body movement are an unit indecomposable.

In 1989, during the 20th Bienal de São Paulo, the artist, in collaboration with the designer and director Octavio Donasci, presented the performance Videovivo where you could see an actor performing with a woman's image projected on a screen. Because this screen was made from a very elastic fabric, the dancer who provided the projected image Analivia could put itself behind the screen and shape this image with your own body without being seen by the public. The impression the public has is that the image of women projected on screen comes alive and three-dimensional, allowing the real actor to hug her and even make love to her on stage. Naturally, given the extreme proximity of the dancer's body with the screen, she had to rehearsal exhaustively to driving his body to follow her pre-recorded image. This technique has similarities with the procedure of the puppet in the puppet's body is led by a handler, but in cases of

utmost professionalism, the result can be so ex-citing that even an experienced actor or a dancer be able to play with equal perfection.

This serves as a brief historical introduction to the project Touch, presented in the series Zonas de Contato, in the Paço das Artes, São Paulo, together with the acrobat João Penoni. Here again, Analivia not appear visibly, as the dancer, she is hidden in a highly malleable tissue, and your body reacts in a choreographic language each time the acrobat, hanging from a rope, touch her body. It's a kind of virtual dance, opens for the imagination, where the viewer must guess the movements of the dancer hidden inside a sort of bag reacting, in an im-provised way, to touches of the acrobat. There is no music, but just pure dance, only suggested. The dance goes beyond the ballet becomes a re ection on being, a thinking about the meaning of life.

Analivia Cordeiro's work goes beyond the boundaries of those few lines of critical re ec-tion. Often she also rubs the eld of therapy, when the artist, surpassing the limits of her specialty, seeking ways to help people who have dif culty dealing with their own bodies. Programs to teach people to stand in front of a computer or learn to see / read are some side projects that she de-velops with great tenacity. She also developed a software for human movement notation, called Nota-Anna, and methods of teaching dance to children. Her doctoral thesis, defended in 2004 at PUC-SP, entitled Looking for a Cyber-Harmony: A Dialogue between the Body Awareness and Elec-tronic Media, was considered by the magazine of FAPESP grants for the research one of the best of the area of Communication and the Arts that year. Having studied the Laban method with Maria Duschenes Brazil and also modern dance in the studios of Alvin Nikolais and Merce Cunningham USA , she brings a load of talent that is yet to be analyzed.

February 2011

AIR, 1985

The rectangular TV monitor frame is the space of the dance. The dancer explores the borders of the screen monitor. There are no image cuts and the sound regulates the spectator's breathing cycle, providing a sensation of calm under the sound of a Johann Sebastian Bach's music.

To watch the video, access

https://www.youtube.com/watch?v=ZmfjC6KZ_OU
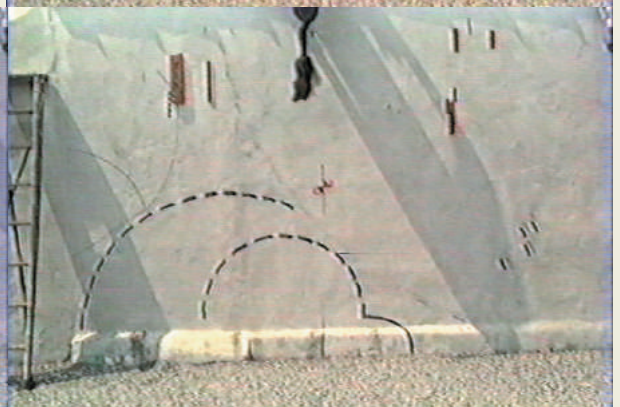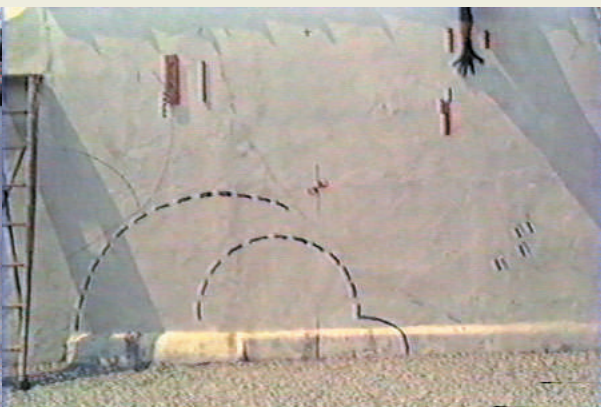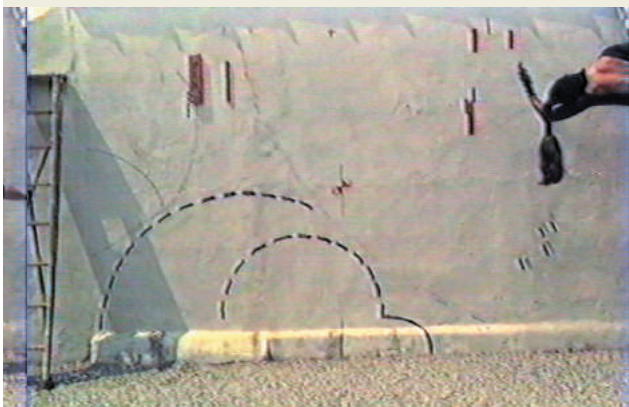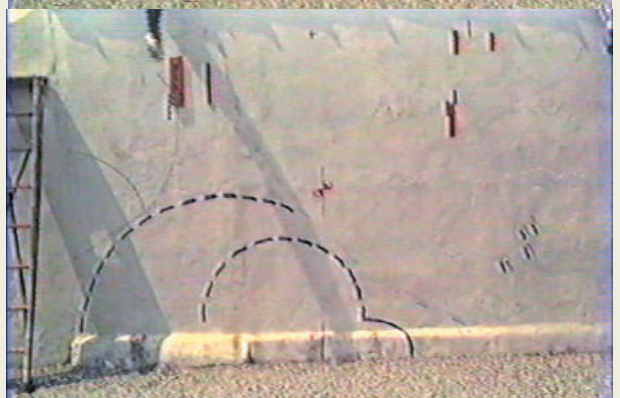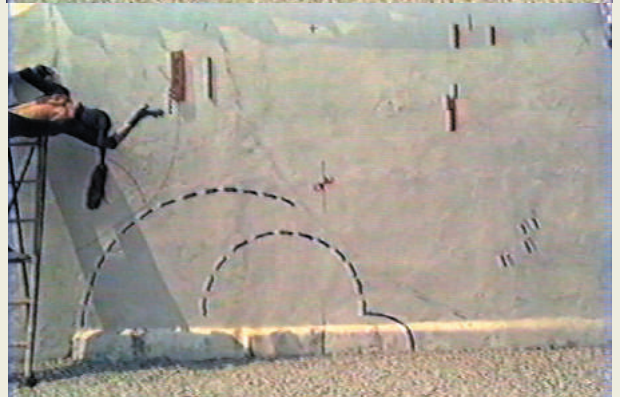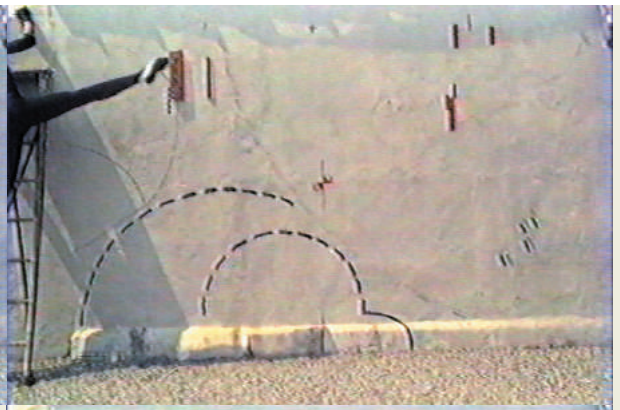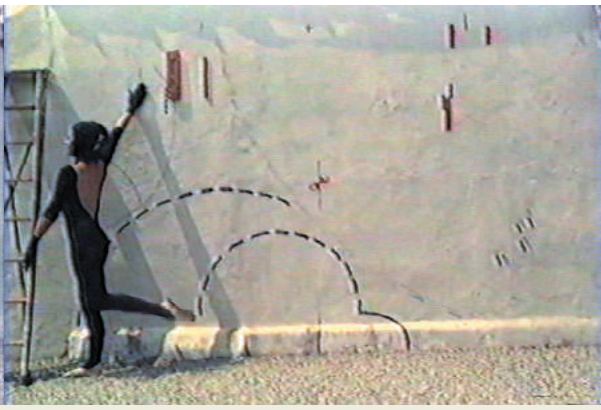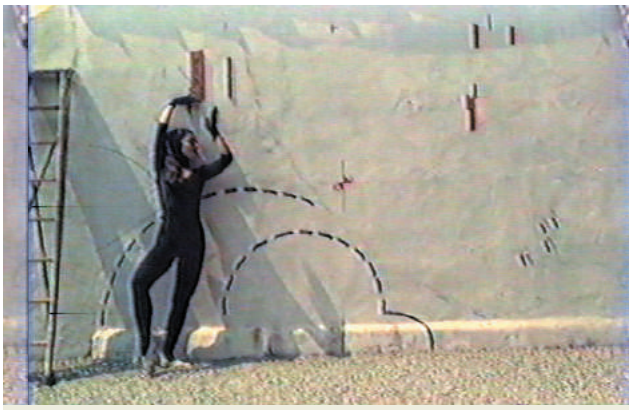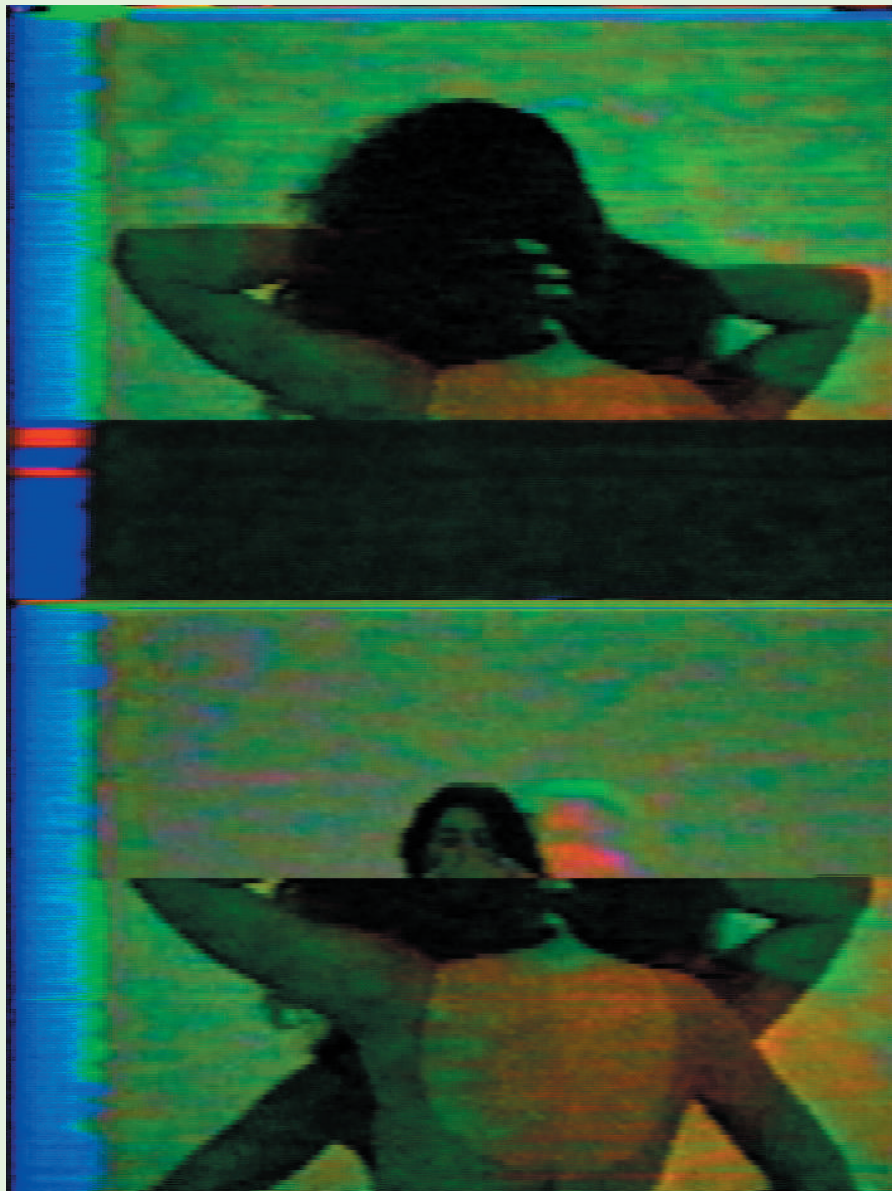
SLOW BILLIE SCAN, 1987

A Slow-Scan art transmission between the MIS (Museum of Image and Sound, São Paulo) Brazil and Carnegie Mellon University USA . Through the slow image scan, this dance explores symmetric spatial relations between the dancers' bodies creating gurative or abstract images, according to the moment of each image scan. The result is a video that makes up non-existent creatures made from 2 or 3 frames simultaneously displayed in the Slow Billie Scan video

Slow Billie Scan's source is the video https://vimeo.com/search?q=slow+billie+scan+rehearsal .

To watch the video, access

https://www.youtube.com/watch?v=d-kDm3VJMQM
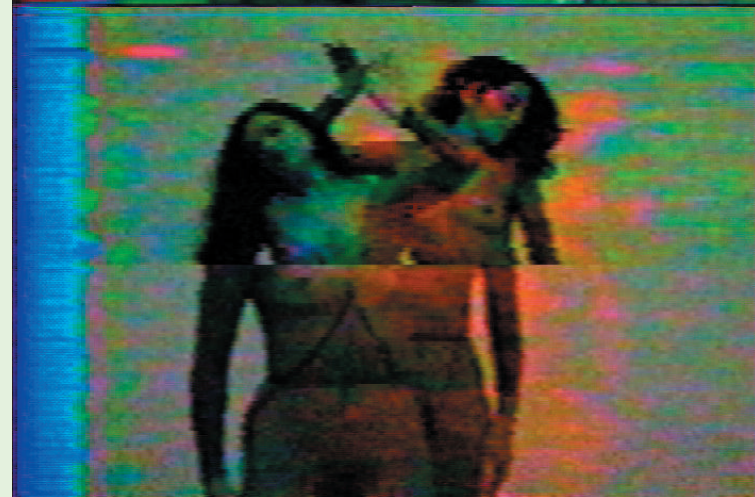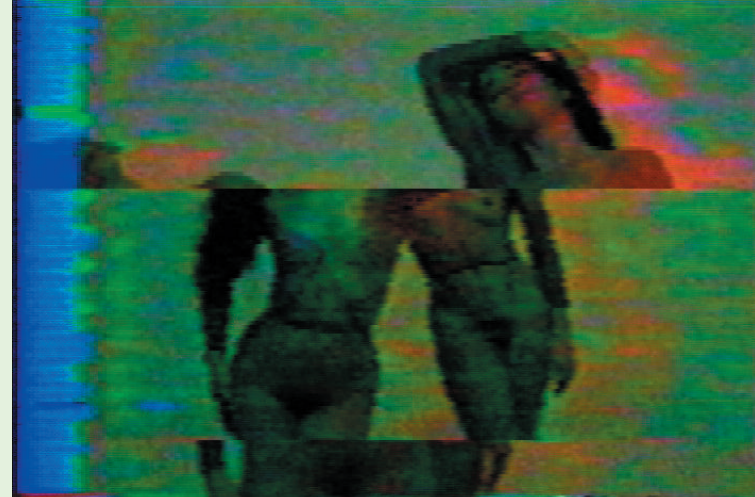
Fernando Penteado creation

Eloisa Beldi creation

Silvia Mecozzi creation

Liana Bloisi creation

Andrea Kramer and Maria Tereza Castor creation

Glaucia Amaral creation

WEARABLES, 1989

Analivia at the Miriam Mamber's Exhibition, as an interpreter wearing clothes considered works of art.

To watch the video, access

https://vimeo.com/50721541
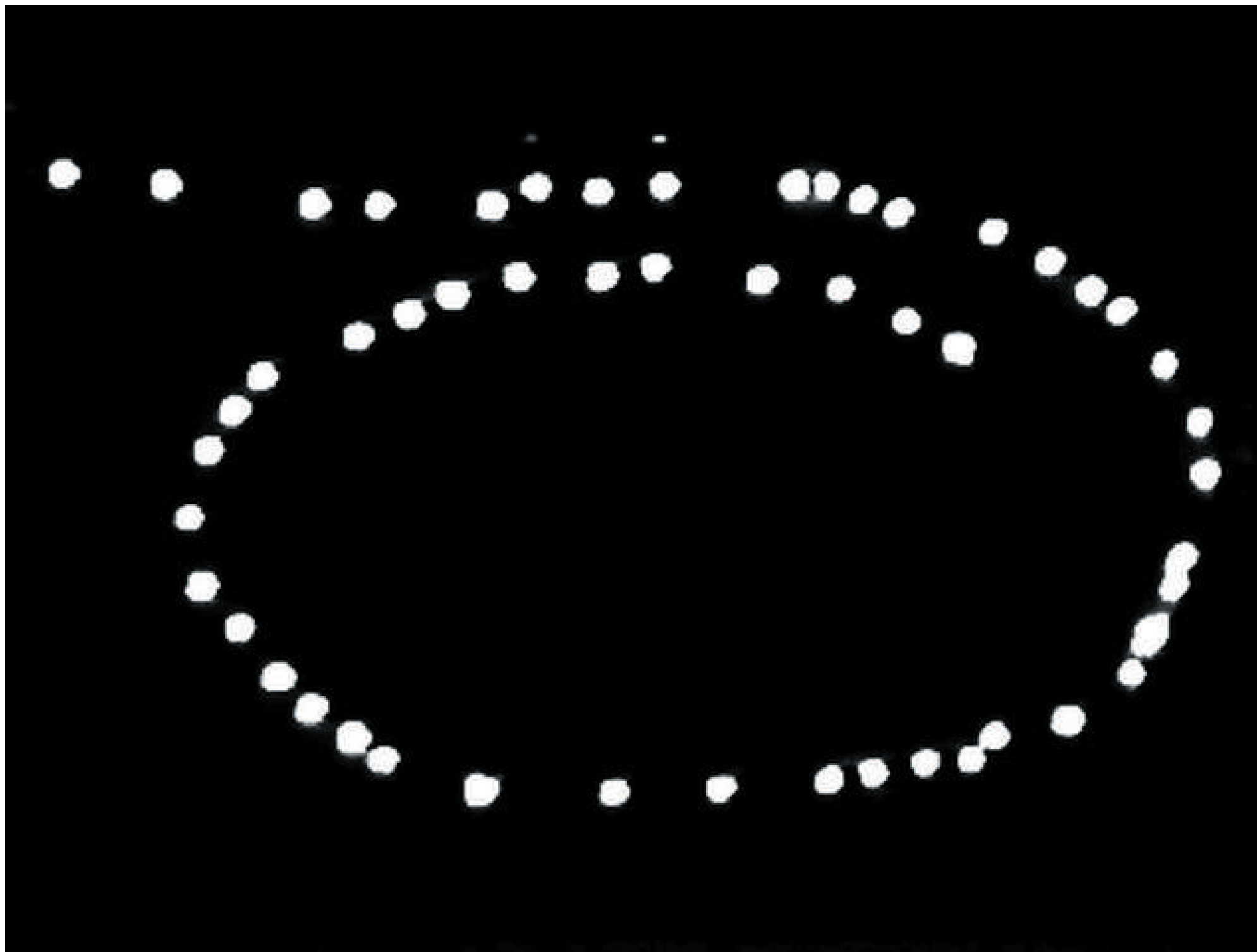
MICRON VIRTUES, 1992

A dance with circuits of lights placed on the body of the dancers, switched turn on and off according to the dancers'movement. Though the ability to perform this choreography is complex, requiring coordinating movement and switching different light circuits on and off, the visual effect is like moving stars in a constellation. The visual aesthetic is a plasticity away from the geometry and near the organic images, characterized by irregularities that can be seen at the macroscopic level in nature.

To watch the video, access

http://youtu.be/RBu8D_W_Q4M

ANALIVIA CORDEIRO

MICRON VIRTUES
A CHOREOGRAPHY FOR VIDEODANCE

The body is seen as an envelope of skin lled with a complex and subtle psycho-physiological content. The expressions of this body are performed by the pores, hair, nails imposing changes in the spaces of a room, stage or landscape. The movements that ll this space can be large or tiny. And it is within these ranges that the body expresses itself.

In a traditional dance exhibition, the stage is the space used for performanceswhich vary according to the audience's view. Hence, the most subtle and minute movements must be discarded because they cannot be seen clearly.

Dancers who work the art of movement for several years witness in their own body these dimension limitations and so, are required to avoid doing these minimal movements in their nal aesthetic product, the presentation. This is unfortunate, because subtle movements are essential to body language.

The video recorded dance opens up a new field in the art of movement. A camera can augment the images, in the scale of centimeters and record minute body movements. This is a great aesthetic resource that dancers as artists can use to express themselves and highlight the filigree of their body's subtle movements. Dancers can choose all the movements they know and feel that expresses their art. On the other hand, the spectators who receive the message face a new image of body and dance.

Why cannot ngernails dance? Why cannot a mouth be choreographed? Why cannot free movement of hair be part of a dance? They can. This is the universe of the new dance and new choreographies, and speci cally this is a new aesthetic research of videodance.
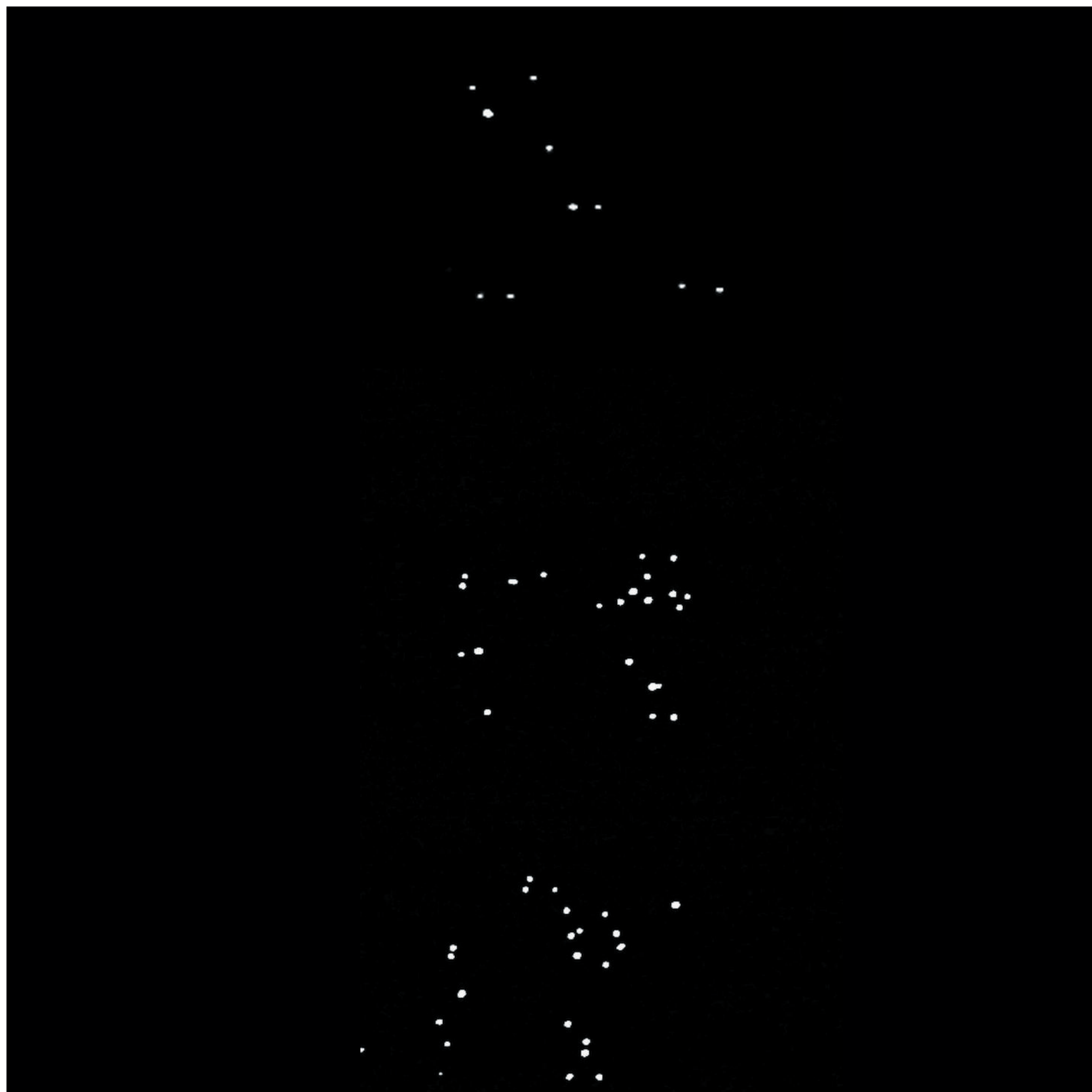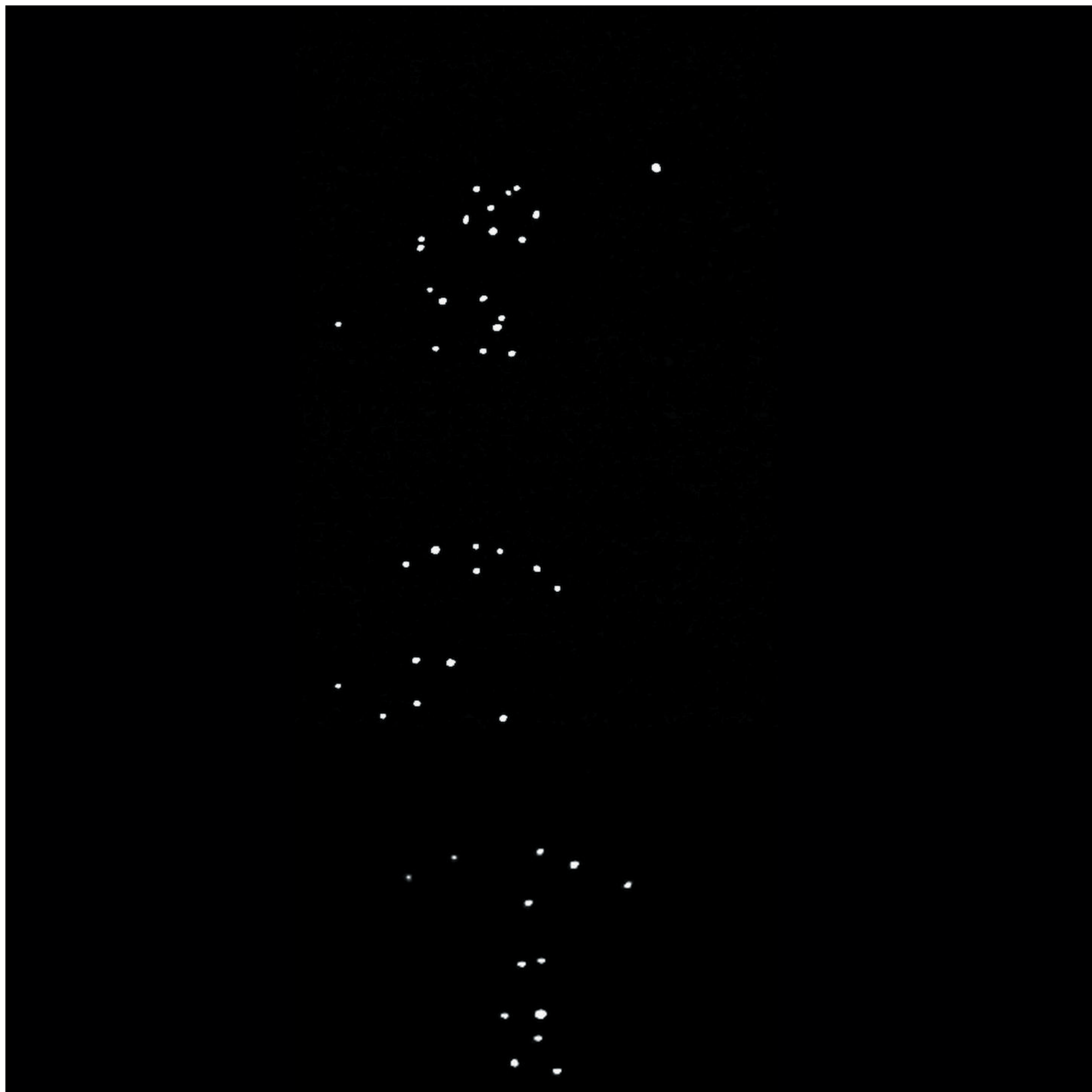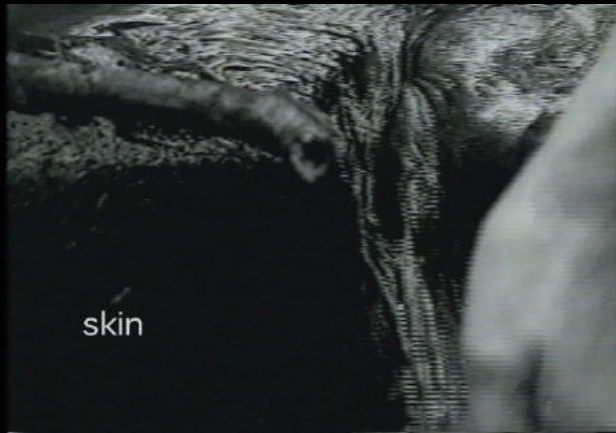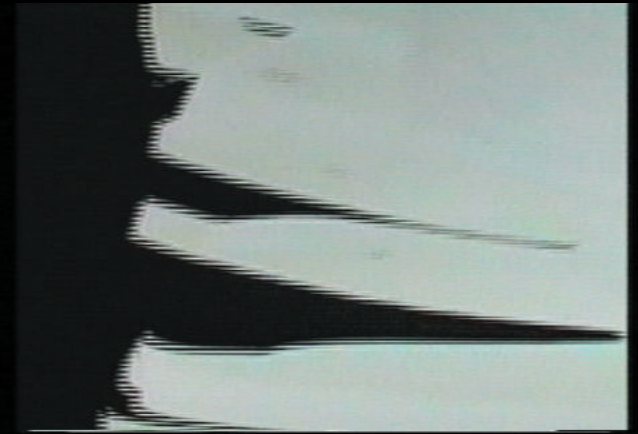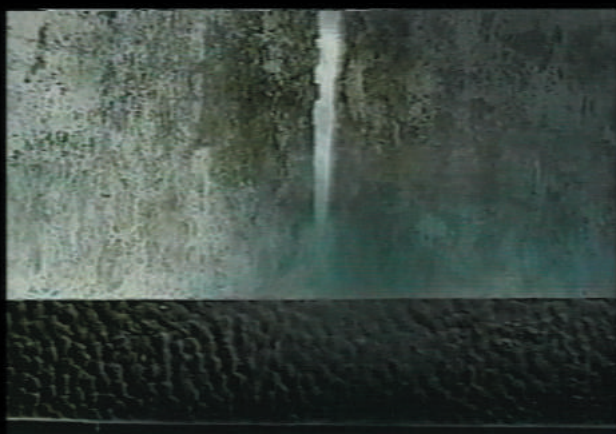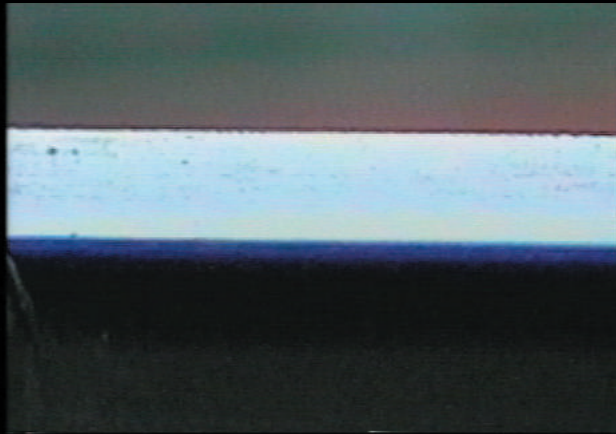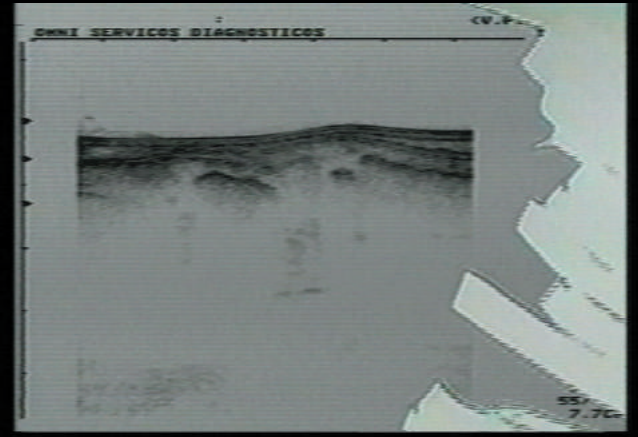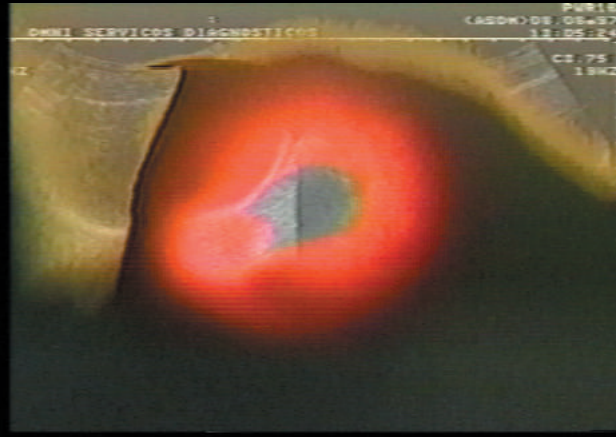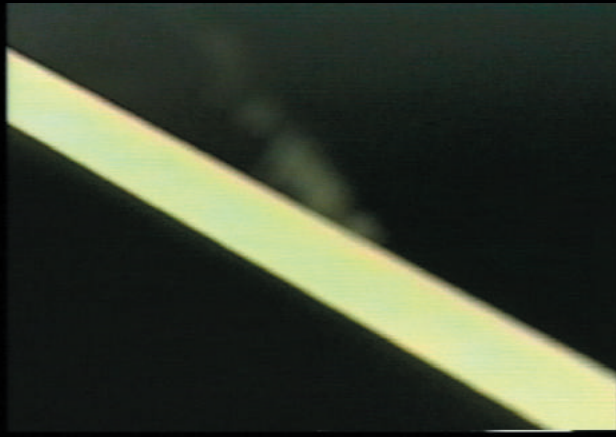
skin
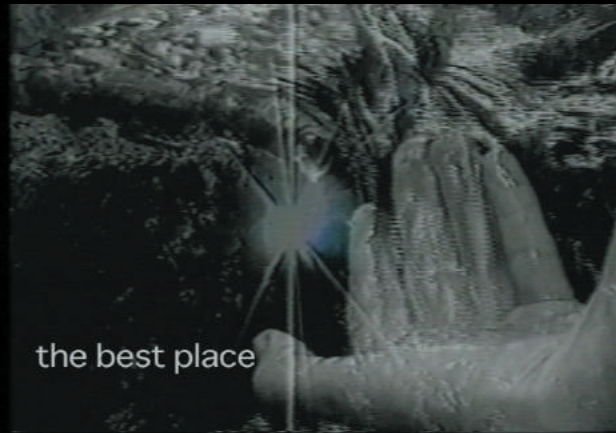
the best place

to write about vertigoes
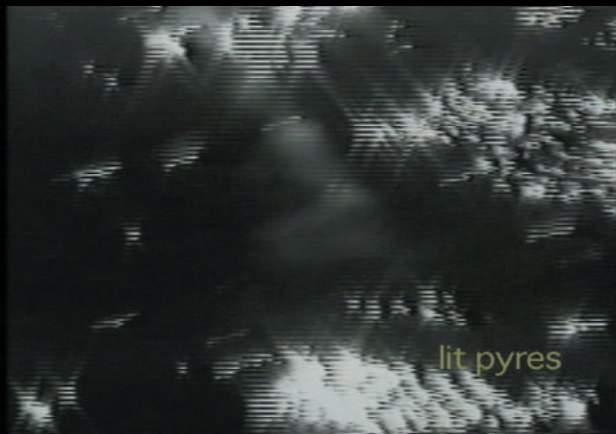
lit pyres

mingling tongues

papyrus of delights

STRIPTEASE, 1997

The selection of images was made without a pre-established script, with the sounds of everyday life and a poem. My introspective method was based on meditation, trusting collective memory and subjectivity. The theme was undressing, peeling off the skin, reaching inside the body, in a physical and emotional universe. A poetical striptease.

To watch the video, access
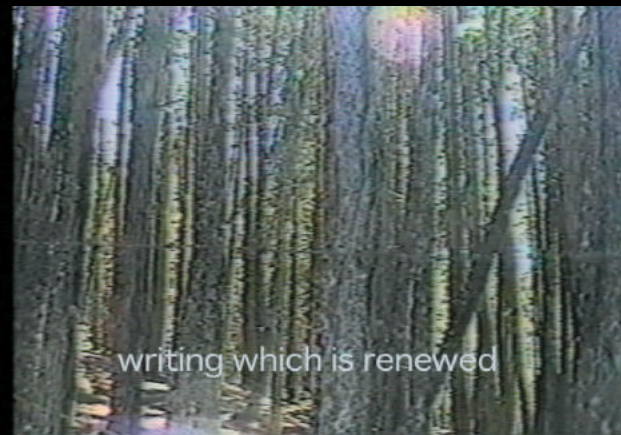
https://www.youtube.com/watch?v=e-Tlhyrphlk
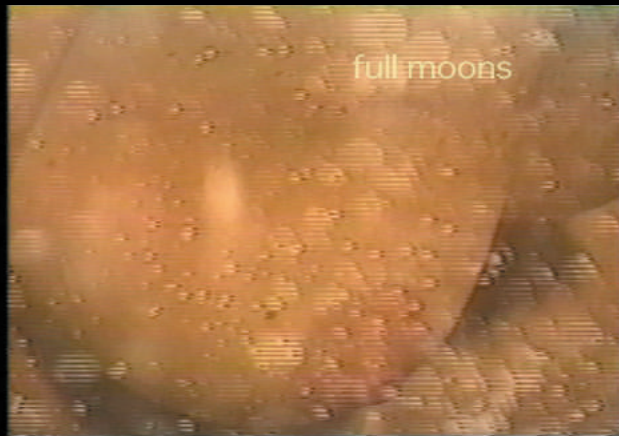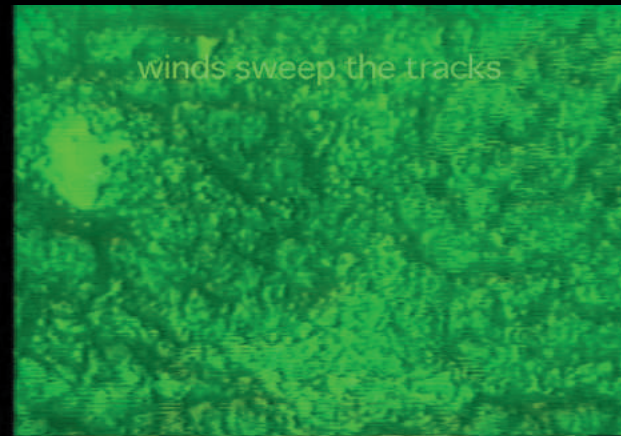
in liquid idioms
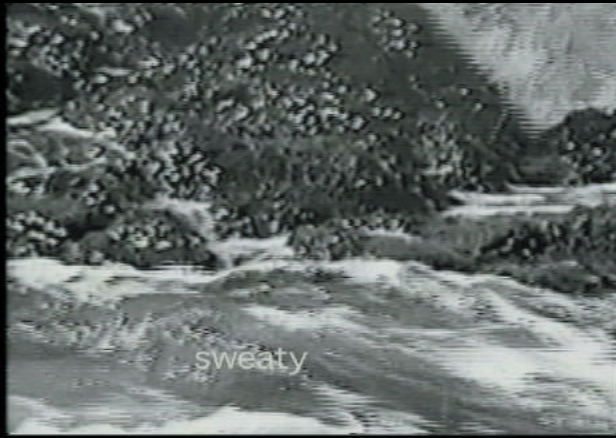
sweaty

semem

with the passing days

but also erased
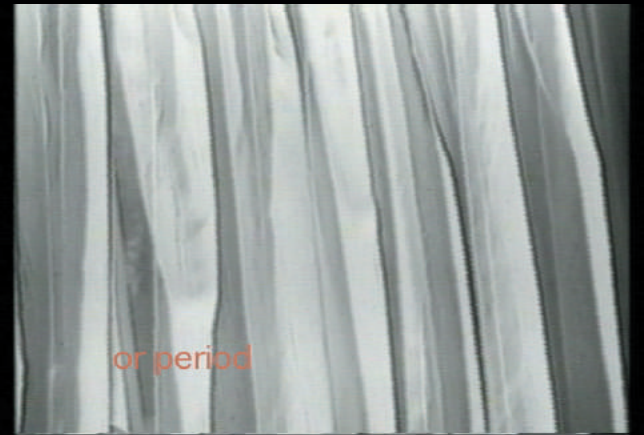
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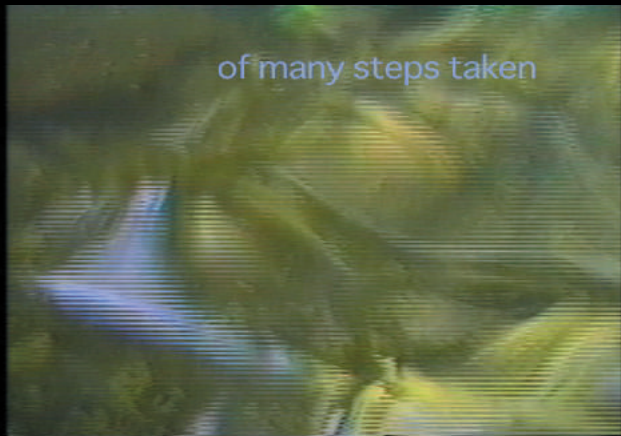
of many steps taken
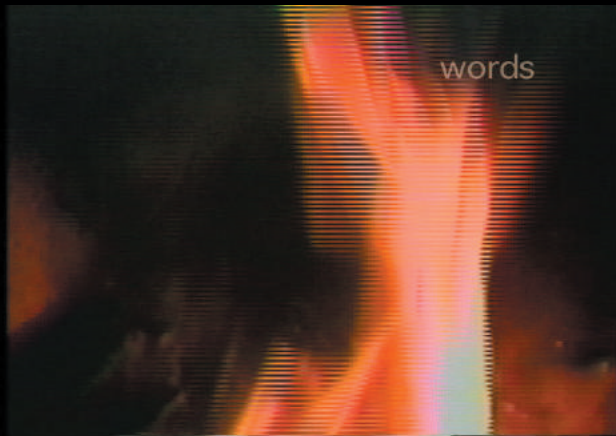
words

that gives you goose-bumps

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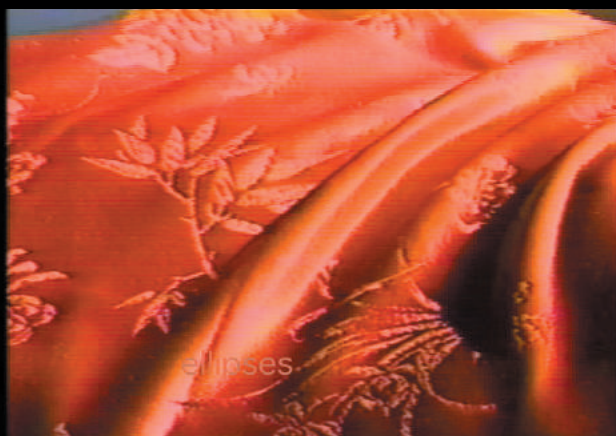
ellipses

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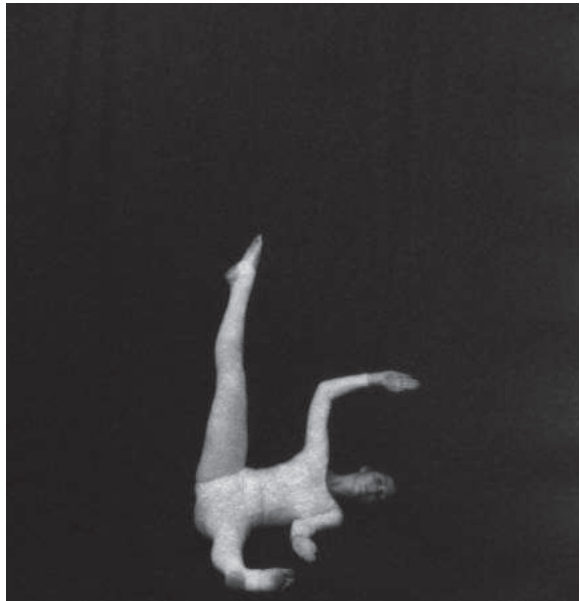
Model: Analivia, 1973
Unknown photographer
2017/1987 (below) Bob
Wolfenson

PHOTOS

Model: Analivia, 1987
Unknown photographer (up)
B

Model: Analivia, 1987 (p. 112 and 113 down left)
and 2003 (above and down right)
2017 (p. 107 down)
Photos: Bob Wolfenson

Model: Analivia, 1987
Photos: Bob Wolfenson

Assembly: Analivia, 2003

Photos: Bob Wolfenson

FLESH I / II / III, 2004 / 2007 /2009

These were created for video-choreography, the dancer and the camera move together as one. The dancers register their own expression in body movement, in utmost proximity. Based on concrete art concepts applied to organic images, the video edition views the body movements as abstract formal elements exploring space over a length of time. This way, a calm and pleasant feeling is achieved as the spectators' curiosity is stimulated. The theme is the body expression in its small details, focusing on its ne sensibility and subtleness as a message against the widespread violence.

To watch the videos, access

https://www.youtube.com/watch?v=eWqMusnjR7U
https://www.youtube.com/watch?v=WUE2BQMJKAs
https://www.youtube.com/watch?v=VtoO16tXbuQ

(&more&

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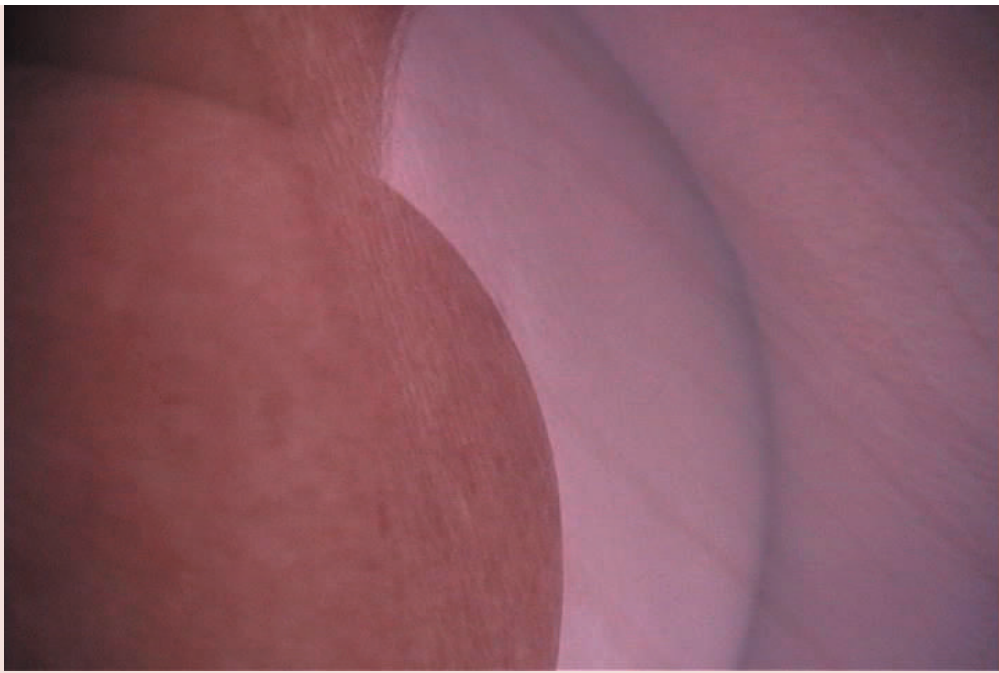
hell
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animais ?
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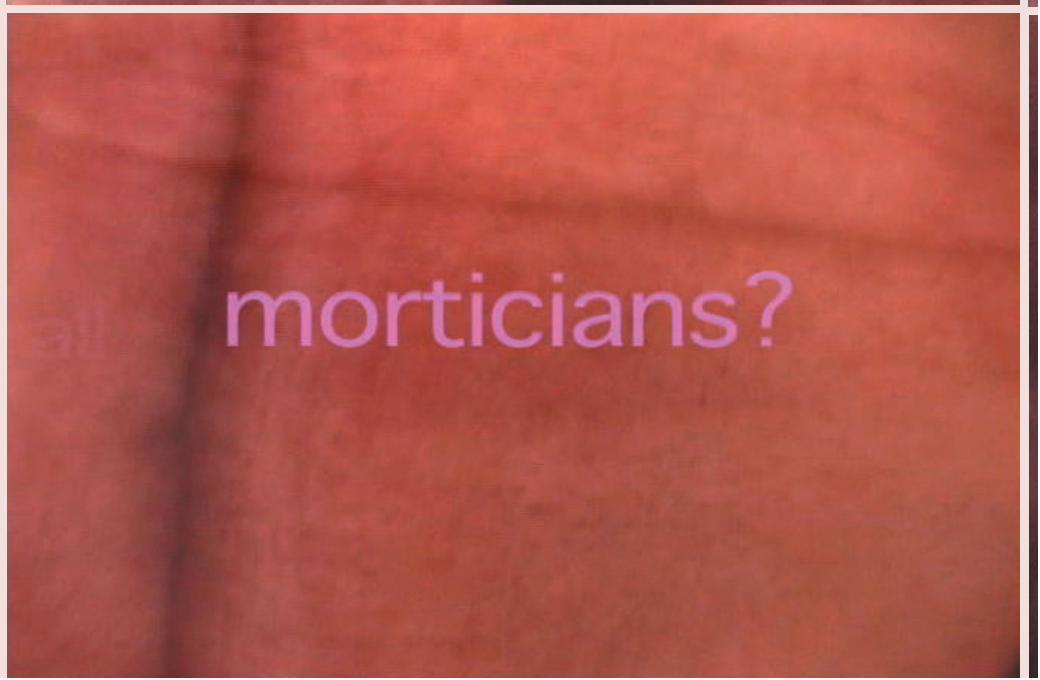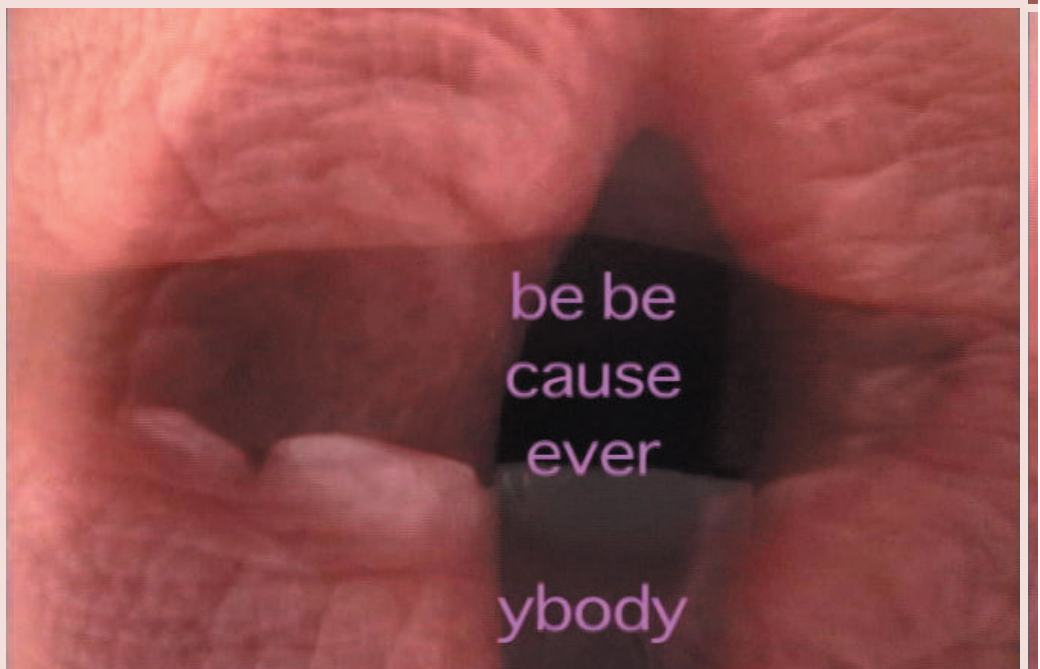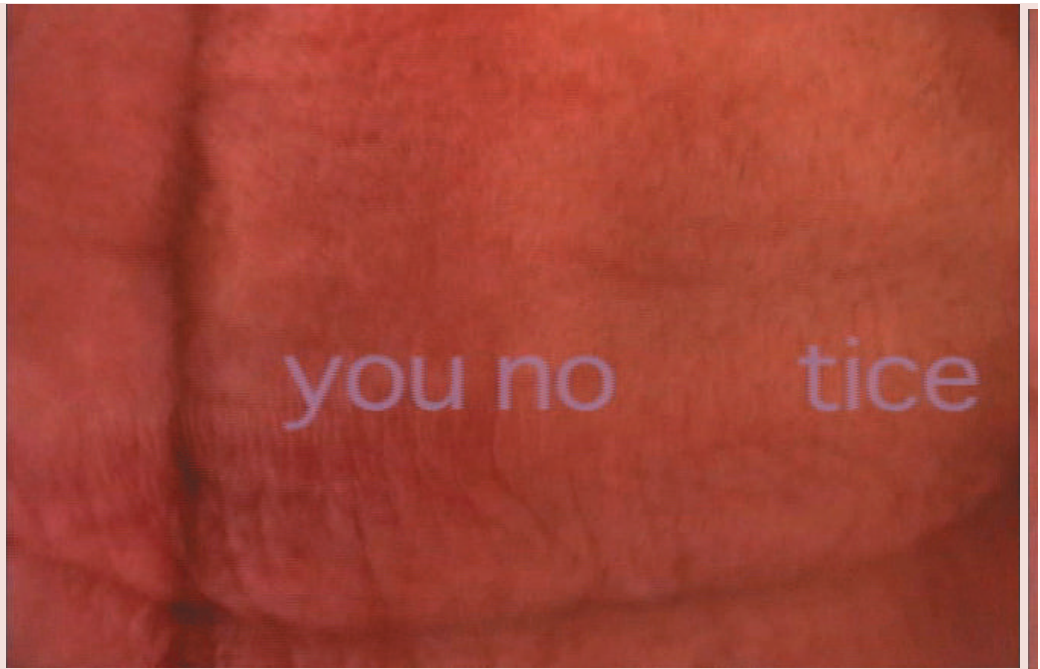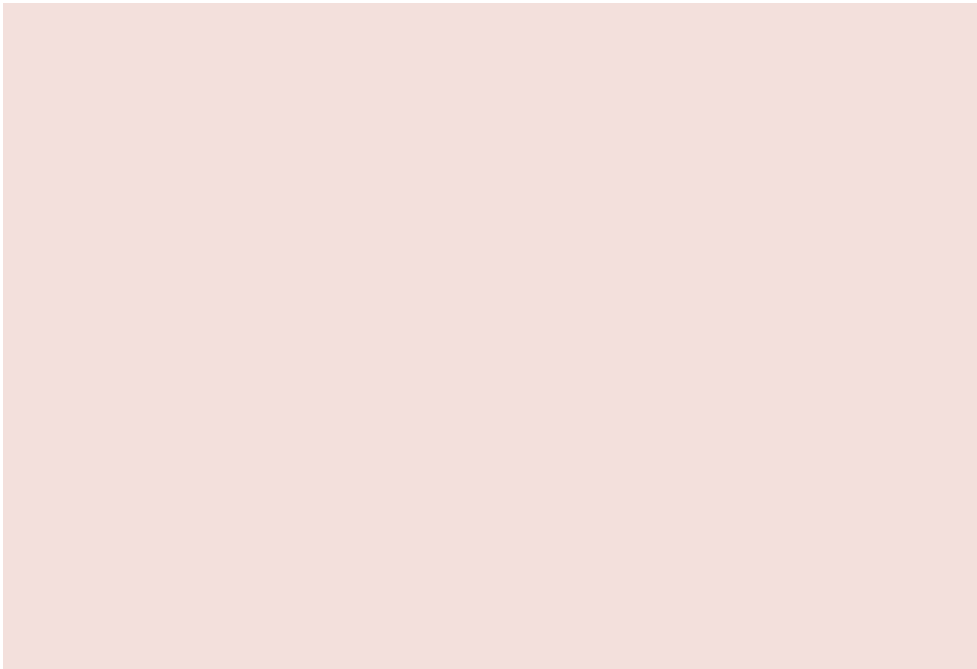
nobod   y wants

Less(not to men

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PERFORMANCE 0°↔45°, 1998

Dance work 0°↔45° with percussion sound is pre-
sented live along with display of the video notation
provided by the computer.

To watch the video, access

https://vimeo.com/50190080

To watch the video, access

https://www.youtube.com/watch?v=i4QADNndxYw

TOUCH/ANCHOR PERFORMANCE, 2009

The performer João Penoni, holding on to a hanging fabric rope, interacts with the other performer Analivia, who is enfolded in fabric, on the floor. While João swings holding on to the rope, Analivia's motionless body is moved by the force of his weight. And when she moves in the fabric, the repercussion moves the rope, and thus he is moved.As sheis wrapped in thefine shroud shecan't see, so she guides herself by sound and touch and sensation of the cloth on her skin. A study of the visual results of interaction between touch, hearing and sight.
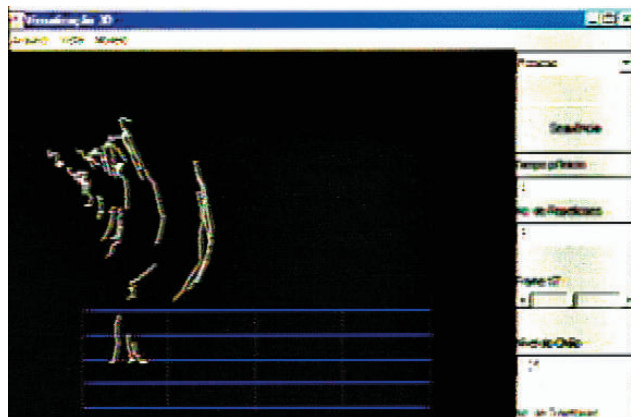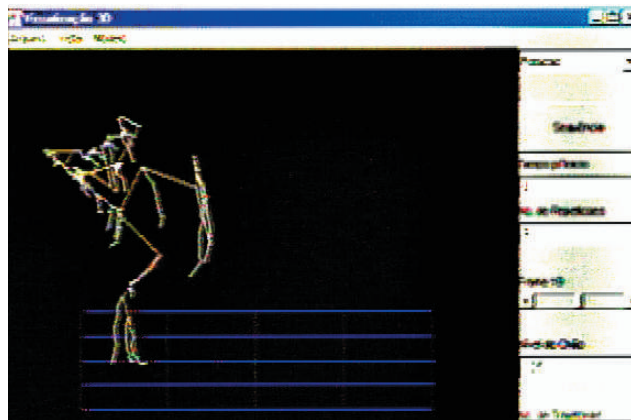
3   HUMAN MOVEMENT NOTATION NOTA-ANNA

The movement notation research called Nota-Anna began in 1982. It evolved during a decade and a half until a software was developed for it. Recently this research was taken up again, exclusively for artistic purposes. This chapter presents these two moments.

Frame image of Pelé's bicycle kick together with stick-figure

Visualization of stick-figure together with the bicycle kick trajectory

Visualization of bycicle kick trajectory
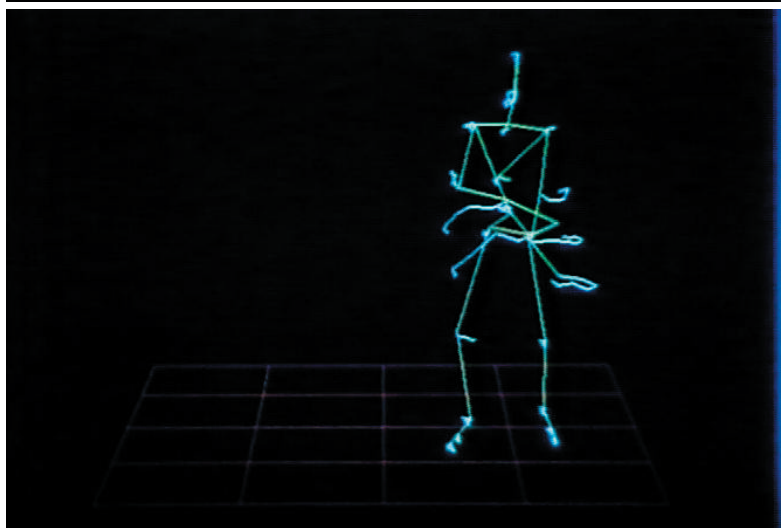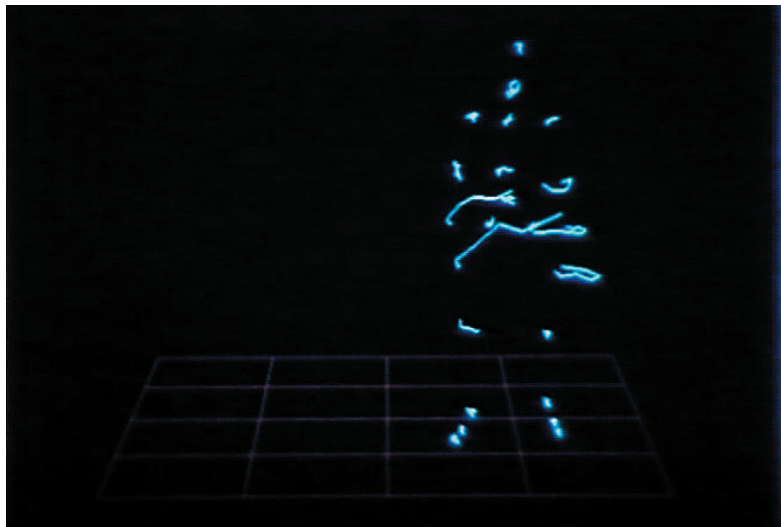
NOTA-ANNA, 1982/1994

A human movement notation research was conducted between 1982 and 1994. This research was the subject of Analivia master's thesis resulting in the book Nota-Anna an electronical notation of body movements based on Laban method. Details of the Laban theory in the Taching chapter.

Nota-Anna is a human motion notation software that graphically describes the spatial displacement of 24 joints of the body in three dimensions. The data input can be through video frames or sensors.

To propose a system of movement notation occurs only at the maturity of a study. A researcher can only try to establish control over the movement after decades of practical experience, self-observation, scientific knowledge, and observation of other people. After such a complex and long study, you will surely understand how little you know about the body movement to try to control it to a large degree.

Nota-Anna was developed in 3 distinct phases from 1982 to 2019. The technological phases of this development were:

Phase I 1982-1986 using a PDP 11/60 and programmed with Fortran IV at University of São Paulo, and then using a VAX 11/780, programming with Fortran 77 at Intergraph of ce in São Paulo.

Phase II 1994 to 1996 started with use of open platforms with Unix workstations from Sun Microsystems SPARCstation 2 and C language together with Graphics libraries. During the third and last phase 1996 to 2001 , Nota-Anna was converted to Java, so it could run on any platform.

Phase III from 2015 till now based on the idea of visualizing the movement through new means, which allowed an extension of the Nota-Anna, in addition to the creation of sculptures. Nota-Anna was improved by new visualizations of the movement volume or of the displacements of points of the body joints. The readers' reaction to Nota-Anna has been very positive. Now we can say that Nota-Anna is an instrument of human communication that writes, describes, and creates the movement for people to exchange messages after the movement has already taken place, as a past act. Please see the sculptures at the Chapter Objects of Art in this book.

Digitizing screen

Trajectories visualization   For examples of Nota-Anna access

Trajectories view with stick-figure   https://www.youtube.com/watch?v=zTNSh01TmBQ

Menu to load 3D information

Visualization menu

PRESENTATION

LUIZ VELHO

Nota-Anna is a system for recording movements, developed by a dancer and choreographer who dedicated himself to think about the signi cance of this form of art/communication.

As Analivia says in the introduction to his dissertation, the task of proposing a new notation body movement is certainly very ambitious.

In fact, a notation formalizes the registration information, whatever its nature. The writing is closely associated with language, and consequently with communication between humans. In this way, it takes on a instrumentalizer role in the storage and transmission of knowledge/feelings.

For this reason, the great milestones of human history are almost always linked to qualitative changes in registration information.

The technology of writing has evolved greatly, starting with the drawings on the wall of the cave, through the manuscripts scrolls, continuing until the invention of printing, to get in the era of computerization. At the same time, languages also evolved, potentiated by the technical facilities of production and dissemination of content.

Given this historical perspective, it is surprising that even today the language of movement does not have an effective writing system, unlike virtually all other forms of human expression, such as verbal, musical and visual language.

From this observation, it can be seen how the proposed Analivia is ambitious A major challenge

that several others have faced with relative degree of success.

To better understand the dif culty of the problem, note that the registration of information is intrinsically linked to the physical nature of this information. Take for example, the audio information, whose physical quantity in question is the air pressure or by other means produced by a vibration. In mathematical terms, we can describe the sound as a continuous function of a scalar the pressure over time. So, to register a sound, simply record this function in some way.

However, what we perceive in a sound, are the changes in pressure that are mathematically characterized by frequency components of the function. Ultimately, these components are the perceptual units that are the signi ers of language. In other words, they are phonemes in speech and musical notes in a melody.

The task of writing these units is to encode using symbols that may be easily recorded and interpreted. On this basis, it builds lexical elements and syntactic structures are created that de ne the relationships between these elements.

Comparing the sound with movement, we can note two signi cant differences: the rst is linked to the issue/capture; the second is linked to the size of their parameter space.

The issue/sound capture is symmetrical and direct. That is, humans have mechanisms that

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enable it to produce and perceive sound waves directly, respectively through the vocal cords and ears. In contrast, the emission/capture motion is asymmetric and indirect. This is because the movement is produced throughout the body, while its perception is made indirectly by the sense of sight.

Note that a singer hears the music is singing exactly the same way as the others around them. A dancer, instead, realizes his move quite differently from those who attend.

In relation to the parameters, the sound is much simpler than the movement, whatever the approach used in the comparison. In terms of production, the sound, as we talked about before, is associated with the variation of pressure; It depends on one parameter only. Since the movement is associated with the variation of the joints of the human body, ie something between 15 and 30 different parameters, depending on which joints are relevant to the movement. In terms of perception, the sound is again associated to a parameter. Mathematically is a scalar function of a variable, and therefore has dimension 1. The movement, given that it is perceived through an image that varies with time, it involves more parameters. Mathematically is a vector function color whit e and black two spatial variables in time. Therefore, dimension has at least 3 f or monochrome images .

Moreover, the movement is not displayed in its entirety, as occurs in three dimensional space environment, but the observation is given by a single viewpoint.

Still on the sound relation with the movement, it is worth remembering that often the movement is closely linked to sound. This is the case of dance, when you follow the beat of the music.

It can be concluded from the above analysis that one way is to register the movement through a sequence of images. Indeed, since the invention of cinema, this format is used for this purpose.

But the motion picture records the movement in its raw form. There remains a form of registration allowing encode syntagmatic units move and assemble more complex semantic structures. Some notation proposals have been developed for this purpose, including the Labanotation which served as the basis for the Nota-Anna.

Such writing systems run an analysis of the essential characteristics of movement as space, time, force and creep. These elements are graphically represented by symbols indicating the behavior of each part of the body.

Although such systems enable the recording and reading of movement and dance, they are quite complex and do not re ect all the signi cant movement of wealth.

It can be said that ratings based on graphic symbols constitute the first generation of motion of writing systems. Despite its limitations, these systems fulfill their role as best as possible, given the constraints imposed by available technology by mid-century. Namely, the two-dimensional and static graphics allowed by paper and pencil.

With the advent of the computer, the era of computerization techniques opens up new possibilities for the development of a second generation of motion of the writing systems.

This is where you insert the work Analivia when drawing up the Nota-Anna system.

The computer enables direct recording of the movement, and furthermore, the use of dynamic three-dimensional graphics. Nota-Anna chose scanning from video images and animated representation by wire gures.

Within this perspective, the system incorporates an option for simplicity that in general is the most effective proposition and paradoxically the most dif cult to achieve. The system design takes advantage of all the features of the current state

of the art in computer graphics, without sacri c-ing ease of access and low cost.

In addition, the system is open for the introduction of new resources from a future evolution of technology.

In conclusion, Nota-Anna, in its current stage, it is undoubtedly a tool that allows the recording and visualization of motion, direct and natural way. With its evolution, by the incorporation of computer vision and artificial intelligence techniques, Nota-Anna, probably can also become a powerful analysis tool and motion design. Maybe even turn out to be widely used by all those who cultivate this art.

MARCELO LEITE
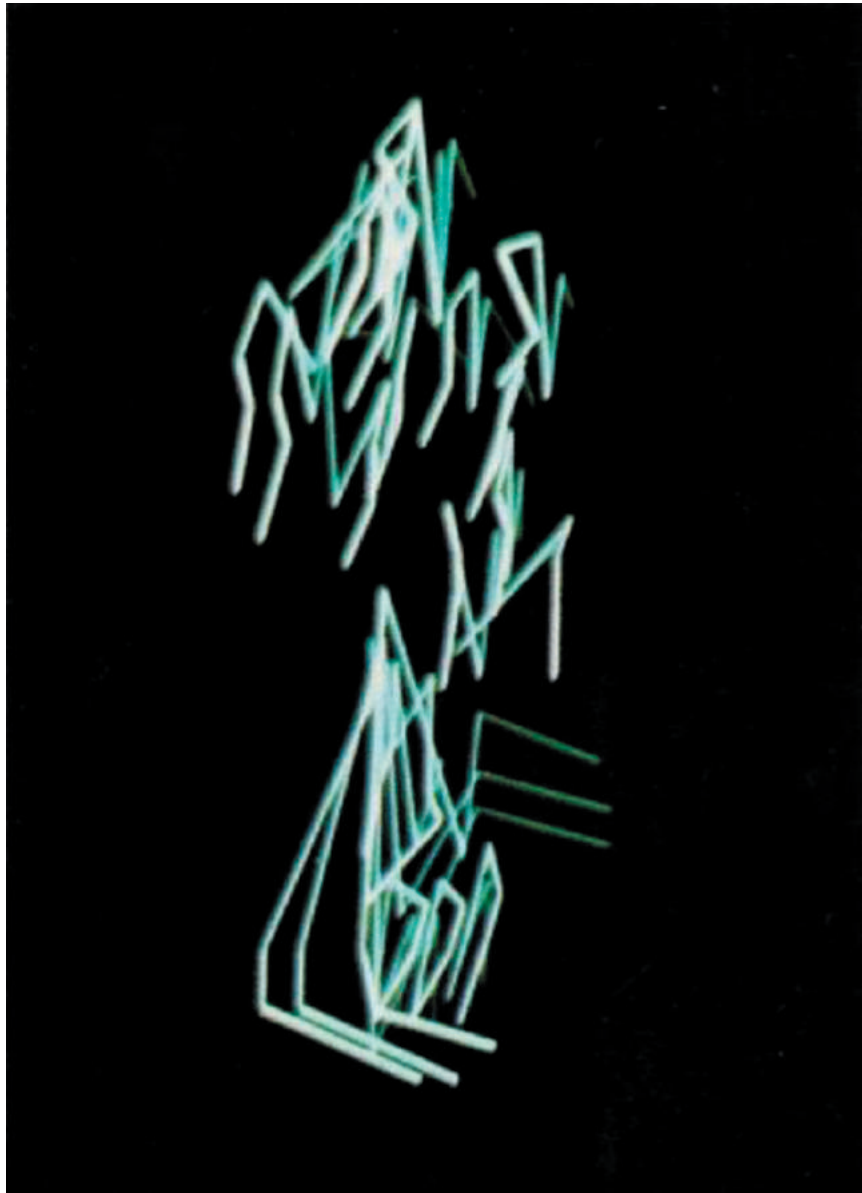
AN ACCURACY OF ISSUE

No one, not even a dancer would see a trace of human movement in the picture above. Yet this is the representation of the trajectory of points of the body, found in Analivia Cordeiro's studies. She researched precise notation for choreography, with the aid of computer graphics. Such an unusual use of the computer, which could only be achieved after years of research and knowledgeof the connection between art and technology.

Is it Computer Art? Not exactly. At best, it is Computer Assisted Art , derived from the established applications of computer graphics design/ computer aided manufacturing computer aided design/manufacturing, or CAD/CAM . The computer as a tool and not as a magical object; multiplying factor of possibilities for creation and research.

In short, it is much more contemporary than implied in the imaginary pseudo-futuristic marketing of this equipment.

From a conceptual point of view, the best way to characterize human movement is utilizing the trajectory-notation, ongoing research by dancer and choreographer Analivia Cordeiro for 31 years, of which at least 12 were dedicated to the study of the openings to dance supported by computer technology.

At that time, in 1973, researcher Analivia then a student of architecture   was one of ve in the world utilizing computer graphics for dance choreography. Her mentor&model was her father

Waldemar Cordeiro 1925-1973 , a landscape designer and a pioneer of computer art, in Brazil.

Analivia's work was considerably different in that computer or digital content was essential to impact the outcome. The result of digital processing is a set of instructions or schemes intended just for dancers and not for spectators. In this case, its access was not clear for the non-professional dancers.

ANALYTICAL POTENTIAL

Analivia has been researching a manner of notation and recording of dance movements using 3D features of images by computer processing since 1981, on a CNPq scholarship.

She started at the Computer Center of USP CCE-USP , where she was introduced to Nilton Lobo, an electronic engineer student. Today Nilton is her collaborator and founded their graphic terminal business, Intergraph Systems Ltda. Her primary concern is to record dance movements so that they are readable for the dancer. According to Analivia, the more traditional alternative to dance notation is the method known as Labanotation, performed solely by half a dozen specialists worldwide   an expensive resource that only large dance companies can take advantage of. Via computer, Analivia seeks to capture four basic elements of dance broken down into displacement in space, body position, muscle strength and   uency.

The development of research initiated in 1973 is described clearly in the article below by Marcelo Leite, journalist.
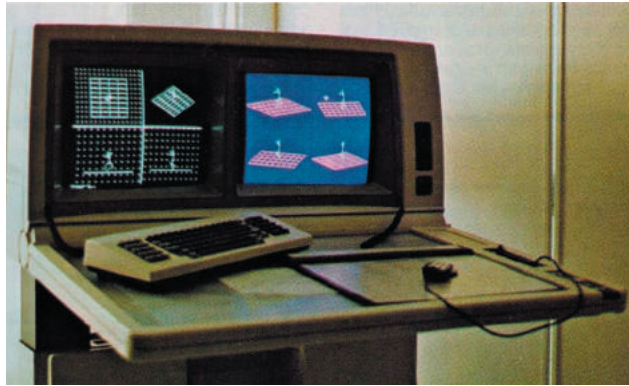
In the graphical season, many features for a lucid use of technology

For this the computer plots 24 points, mostly on the joints of a body image. The next step is to register the positions of each of these points at predetermined time intervals fractions of a second in the computer memory through a graphics board. When the sequence of movements are a historical documentation, as in the preservation of a virtually extinct Yemenite dance recorded on 8mm lm, the digitization of points can be made frame-by-frame by its projection on the working station.

Then each position is displayed on a 3D program developed by Nilton. From there, the resources of the graphic station Intergraph multiplies the analytical potential of this form of incipient notation: modifications or scanning, zoom effect, observation of detail, simultaneous observation of several successive positions and, especially, the turning of the figure and the plane stage leaning towards any of the three dimensions of space.

This last feature would be the main advantage of computer notation compared to other registration processes, such as film or videotape, which display the image in only two dimensions, obtained from a single point of view. Thus, many details are lost and parts hidden by other body parts. Finally, Analivia commends the fundamental characteristic of computers Memory translat-

ed into binary code, large amounts of these images can be easily stored on tapes or discs. The many features collected on the graphical platformare key to the best use of technology.

FORM AND SUBSTANCE

Analivia has so far mastered the freezing the three-dimensional positions. The process of reading a movement registered by a dancer the most important part, according Analivia is still in testing phase. It is being tested at the moment the possibility of representing dynamically transition from one position to another by lines representing the trajectory of each of the 24 points of the body, resulting in complex images see opening picture .

The challenge Analivia takes on is to achieve a factor that recomposes de original emotion besides the pure technical result, by trying to give those formal schemes some movement elements such as fluency and muscle strength, which inevitably are lost in the conversion from analog to digital.

One of Analivia's arguments in defense of her method is its potential for saving time and energy in experimental choreographic composition processes, where the dancer acts as a mere puppet under the choreographer's orders. With computer assistance, the choreographer could continue to create, to experiment and select sequences of movements, until two or three would be tested in practice dispensable only at certain stages and types of choreographic creation, in Analivia's opinion.

At this point the reasoning of the researcher follows the most common line in defense of all types of automation: relinquishing the more mechanical moments of the work in favor of those more pleasurable ones.

Incidentally, her goal was to optimize the relationships between different technical teams, during her first experiences with choreography and computer in the context of choreographic production for TV. This initial phase of her research - conducted between 1973 and 1976 in the Computer Center of UNICAMP by the invitation of the dean Zeferino Vaz resulted in the M3x3, Gestures, 0°↔45° and Cambiantes videos, displayed in important computational arts shows all over the world was intended to obtain detailed choreographer instructions for dancers, TV directors and camera men. Such instructions generated from programs relating relevant components of the dance and TV languages, allowed the dancer to know, for example, from which angle the camera would be; the TV director and three camera men, in turn, received precise details of the angle to be adopted front, side, etc. and the plane of focus.

All this justified Analivia in her article The Programming Choreographer published in the magazines Data&Ideas 4, Brazil 1976, and Computer Graphics & Art, February 1977, California to circumvent the effect intended by choreographer's messages.

On the other hand, more precise instructions, than the metaphors usually employed by choreographers, would enable staff to self-critique and would be more objective and referenced.

ONE AMONG OTHER HALF

More than to the choreographic creation, however, the computer notation would be important for preserving cultural heritage, in process of being forgotten and then lost, like a traditional dance of Yemen. The film of this dance was entrusted to Analivia. Computer notation should be enhanced with mathematical precision to record the ligree of ne, discrete and subtle movement. This brings
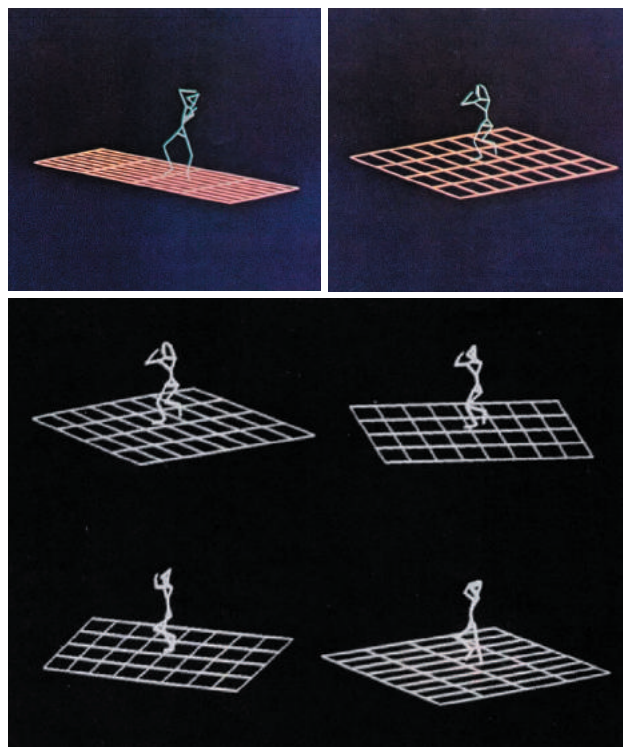
The same position can be observed from different angles simultaneously and on inclined positions in a traditional Yemenite dance.

us to a combination of image processing computer, essentially analytical, and what might be called synthetic media although, paradoxically, partial of movement xation, as in lm and videotape.

In lucid design, the computer is put forward as a means among others to study the movement with precision, which unfolds in a series of specific tasks, as well as many others are unfolded by other technological means like videotape. But there is nothing towards making the technology a battle ag, brand or label:

To speak of art and technology is to say nothing, because technology is something implicit in the day-to-day. Twenty years ago the use of computer in art was out of the ordinary, now after twenty years of experience, there is a whole theory about it.

That's right a matter of accuracy and memory.
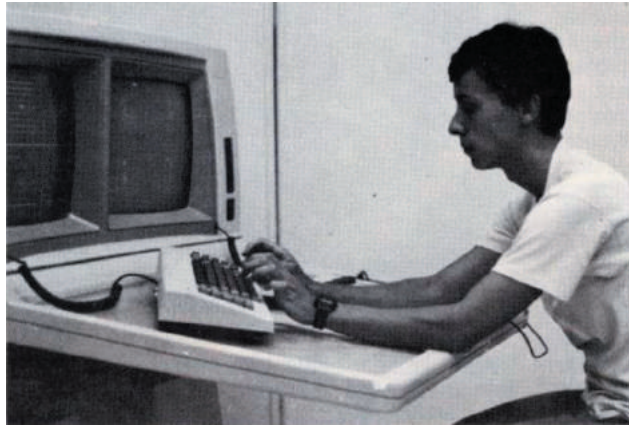
Nilton, interpreter technological apparatus

FOUR HANDS

Nilton Lobo Pinto Guedes, fourth-year electronic engineering student from the Polytechnic School and intern at Intergraph, was introduced to Analivia Cordeiro in 1981 by a professor at the Electronic Computer Center of USP. At rst, I had no idea what she wanted but did not know how to jump out, he confesses. Obviously he failed, because the collaboration has lasted nearly four years, having survived the change of institution and of equipment.

In CCE-USP Nilton started researching how to 3D the body plan with those 24 points, but soon the equipment a graphic terminal connected to the PDP-11 computer he used, ran out of resources, presenting limitations. The biggest dif culty we partners faced was data entry, which would necessarily have to be done in three dimensions.

It was through Analivia's former partner, collaborator in the times of Unicamp Computer Center Guillermo Barrera Fierro, now Digital's software manager they came into contact with Intergraph.

Two years ago, before the explosion of the CAD/CAM market, they met in Intergraph so as other artists v. The January/February issue of Iris room for experiments with the company's sophisticated graphics resource computer.

Nilton then had to learn how to master the Intergraph stations, each with two high-resolution monitors somewhere around 1.3 million dots on the screen, four times more than a standard TV . These stations are connected to Intergraph 11751/11 a VAX computer of Digital and some plotters tracer machines charts and drawings Hewlett-Packard.

Within a month, he knew enough to complete a program to implement three-dimensional gures scanned in two. Sometime later, in August 1983, Nilton was invited to intern in the company, just in his area of professional interest: design, simulation and implementation of electronic circuits, one of the largest CAD/CAM application areas.

Analivia continued working and with Nilton's constant presence supporting the company and its growing field in technology. The work division became more flexible in terms of functions, programming and choreography. It should be a work in professional bases, complains Analivia, denouncing the lack of local research of its kind in Brazil.

NOTA-ANNA: AN EXPRESSION VISUALIZATION SYSTEM OF THE HUMAN BODY MOVEMENTS

Nota-Anna is a human body movement notation[1]:
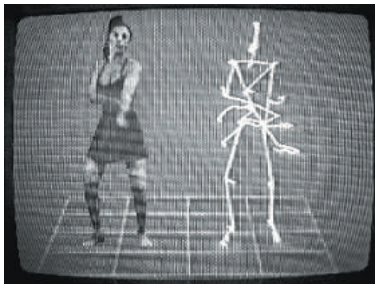
Nota-Anna[2] is the result of the union of theoretical and practical experience in two areas of knowledge: computer-graphics and non-verbal communication. The computer in this case was a source of inspiration to solve problems, not of limitation. The capacity to generate original ideas produced through mental gymnastics , as occurs with many data technicians, is not enough; appropriate solutions demand practical experience and a very clear objective. The ve points below are this research basis:

1. the contact with contemporary movement notation systems: the Benesh Notation, the Labanotation[3], and the Noa Eshkol Notation. All of them are symbolical languages, which requires specialized studies to be used.

Example of Benesh Notation

Example of Noa Eshkol Notation

Example of Labanotation

Sawyer Seminar, Chicago

1 Before reading this article, please consult the chapter about Laban Method at p. 187.
2 Nota-Anna was created by Analivia and the technical development by Nilton Lobo, during the period of 1984/1994.
3 This is the notation of Laban method.

2. my experience as dancer, based on improvisation,

3. working with my computer-dance system[4] 1973/76 , I discovered that for a student/interpreter to see a movement, it did not necessarily have to be a human gure in motion. The drawing traced in space, revealing the richness of expression and the emotional content of human movement is enough.

The dancer receives instructions like:

time   4   5

displacement in space

camera   over   frontal

postures

top point of view

4 At the time this article was written, most of the devices were wired the mobile phone had just little use. Today, most of them are wireless, but the general concept of this text is still valid.

5 In a body communication, the person uses its corporal image or self-image: the mental representation of our body, i.e., the three dimensional image of the way it appears. This image is formed through sensations we have of our body heat, pressure, pain, physical muscle movements and internal sensations uni-ed by the immediate experience of the corporal unit.

4. the Art of Movement teaching experience in classes for children,

5. the non-verbal communication analysis, when the body is connected to instruments like computers. Nota-Anna is intended for any type of movement; embracing the non-verbal language, of behavior, of the silence that communicates our sentiments. In this sense, the body communicates per se.[5] All of its movements and parts, the body shape, its posture, the features of the face and other details compose a non-verbal message.

Nota-Anna supposes the use of computers to read all those movements. This is an instrument invented by man, as many others, to increase the body performance in its interferences in nature, throughout human history.

When a machine or any tool is used for a long time, it shapes the users body imposing physical behavior or emotional obligations throughout his existence. This behavior becomes a part of daily habits, which are object of consciousness only when it causes pain and suffering. This is the case of the carpal tunnel syndrome, what is frequent in computer typists.

Besides the biological and genetic heritage, daily habits shape the internal body space, located inside our skin. In other words, daily habits modify the muscles, glands and body parts as well as human dreams and emotions. So, when a tool is involved in these habits, we can say that it modi-es the human body. A common example: to show happiness, a boy holding a videogame control in his hands, cannot open his arms, imposing stiffness to his trunk.

From this point of view, when the body is connected to a video game control, computer keyboards or VR glasses, it is obliged to have an immobility during the time the user is playing, usually for hours. The person's resulting behavior takes on a vicious and obsessive attitude.

On the other hand, the visual and audio environment created in these games, restricted to a tecnoculture, are full of violence and unbalanced desires for competition. The resulting behavior is body immobility and excessive high muscular tonus.

Taking in account these 5 points, I ask:

— Having a computer as a partner, is it possible to perform act in a light, loose and fun way, regarding the body expression movements?

— Is it possible to interact with these machines abandoning, just for a little, an obsessive behavior to have just pleasure and trust positive internal feelings, letting out our necessities and curiosities, far from physical and mental obligations or rules?

When a tool is created it should be tested suf - ciently to measure the consequences of its use in human behavior, despite of market success in a short term or the eccentric technological stunts. Then we could be respected as complex beings instead of primary living machines. My posture is to think what happens today, to be able to contribute to the future.

To answer the questions above, the main conclusion reached in this research was that an ef - cient movement notation system should necessarily be meaningful and easy to read, involving, and charged with emotion. Nota-Anna have attained these objectives through the visualization of actual movement in a manner analogous to human perception of this movement: its trajectory.

Nota-Anna's most remarkable characteristic: the output shows the student/interpreter the displacement of the body parts, meaning the visualization of the essence of emotional expression of movement in its smallest details.

Nota-Anna of an Yemenite dance movement, 1984

THE USEFULNESS OF NOTA ANNA:

A fact of our reality: how many hours a day does a child or an adult spend on a computer or video? How many hours a day do they use the computer or video as a semantic   lter in their contact with the real world? Usually, many hours, maybe too many. The main point here is that the child's body movements are very restricted.

A child that does not have life experience through its body movements does not know its own potential to make his/her life full of emotional, mental or motor abilities. As the psychologist and physician Henry Wallon says: the happiness begins with the body movements possibilities. [6]

This is the reason I created a tool that besides inducing someone to move their body, is easy to use, even by a child. Nota-Anna's uses procedure do not require any symbol memorization[7]. Being iconic[8] and isomorphic to movement it also helps to eliminate the use of symbols and facilitates reading, making special training unnecessary for its use.

[6] WALLON, Henry; As origens do caráter na criança; São Paulo, Editora Nova Alexandria, 1995; p. 120.

[7] If the trajectory is short the person reads it at once, but if it is long the person moves its eyes along the motion track. So the eyes movement induces a head movement and, consequently, all the vertebrae moves. The nervous systems receives an informations of a whole body movement.

[8] An icon posses a similarity or analogy with its real reference. Ex.: a photograph, statue or pictogram.

Nota-Anna reading using Virtual Reality glasses and a notebook

To reproduce a movement, only three visual inputs are enough: the speed of each body part displacement, the line and its directions translated in trajectory in time and space. This is because the person moves and learns how to move using its proprioceptive sensibility, that registers the motionless positions of the body parts, i.e., the posture[9] and its motion[10]; anduses also the visual persistence, that registers the movement trace-forms in the air.

On the other hand, a movement notation that uses those visual informations can show the movement's intention. That is the reason the notation, furnished by the computer, should induce the expressiveness of the reader, as the movement transmits a clear message and attains its signi cance through intentional gestures and interpretative subtleties. The objective of turning real dancers into animated drawings, does not exist.

The Nota-Anna easy-reading, pleasing the student, demands the use of his full expressive capabilities to demonstrate sentiment and instinct, which sometimes must be accompanied by an attitude of mind-negation. There is a fable which illustrates why movement notation should demand more than just intellectual capabilities: a cockroach asks a centipede to explain how it managed to move all of its hundred legs with such elegance,

ease and coordination. From this moment on the centipede was never again able to walk.

I remark that movement interpretation as a space trajectory came from long ago. The ancient Greeks de ned dance as a drawing in the air. Laban also looked upon movement this way: Our awareness of space-form actually being shaped can become more clear when we execute the movement and steps with the eyes closed, concentrating on the formal ow of the line. [11]

To the Greeks or Laban, the movement trajectory was perceived only through the human sensitivity, but the new technologies brought the real possibility to see a movement trace-form in the air.
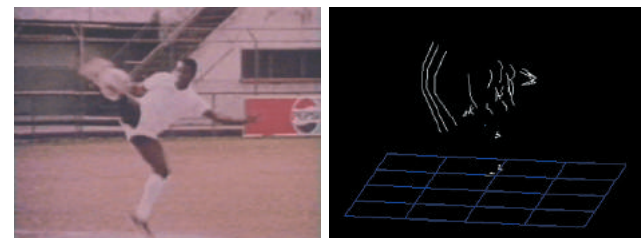
The soccer player Pelé's movement, lmed in 1968, and its Nota-Anna notation.

We have to remember that this new reality, present in art&technology area, is only a small part of human knowledge realm.

9 Posture is the body immobility during short or long time, resulting from simultaneous contraction of antagonistic muscles, or isolated muscle contraction counterbalanced by load.

10 Motion is the body's parts displacement in space, going from one posture to other.

11 LABAN, Rudolf. Choreutics. London, MacDonald&Evans, 1966, p. 85.

HOW DOES NOTA ANNA WORKS?

To use it we have to follow 3 steps:

1. To capture the image, one video camera, a computer with video input and a browser installed are used. This is an important detail, because usually the 3D processes use two or three video cameras data. In our case, we use only one video camera data.

2. The digitalization/3D process is used on a human body stick gure, which parts and joints are numbered and its dimensions are de ned according to the real model proportions, whose motion has been captured by the video.

3. The observation of the resulting images. The notation reading aim are to analyse, imitate or create movements based on the original movement recorded. As the experience shows, to reproduce the movement by imitation a person has to learn the difference between the project and its performance. Many children think when they press a button they can kill a powerful monster in video games, but when they use the computer to induce its own body movement they perceive that it is necessary to dedicate time and energy to perform the real body movement. What is important when learning, is not the mechanical gesture repetition, but the understanding that feelings, emotions, wishes, insecurities, fears, once known, generates courage.[12] I remark that affection participates in this process. What is most important is to attribute meaning to the learning subjects.

Nota-Anna, plays and preserves the memory of the complexity, richness and ephemerality of movement, presenting as features:

simplicity of its appearance and organization according with state of the art technology allied with low costs a very important point in countries like Brazil ;

input and 3D processes using one camera allowing to transpose old lms/videos, a basic condition to create a memory and a history of human movement, so necessary to our society;

transposing video to the image le: the video, using only one stationary camera, is the input material. If a person uses adhesives or wires connected to their body, she/he tends to lose spontaneity the movements of everyday life cannot be studied using arti cial laboratory systems that is why I opted for an input using a frame-by-frame videotape system of movement register, even though this procedure is slower than using sensors attached to the body parts.

JAVA language running on any computer;

instant reading of the movement, without any training, allowing an intuitive and/or systematic understanding of movement language syntax, making easy the integration of varied elds of body movement studies;

this software intends to open the imaginative capacity of the user, child or adult, demanding for its use the sympathy, intuition and the luck that this system nds its way into their hands ;

cultural exibility allowing a synesthetic communication between distinct people, groups or cultures.

conveys the poetry of movement: given to the eyes is the soul's intention Aristotle .

CONCLUSION

Observation should precede interpretation or codi cation of movement. The job of codifying human movement has not yet been accomplished, but many propositions have tried and failed. It is an error to try to codify movement as if it were a word in a dictionary, having only one meaning or message. On the contrary, a movement transmits various meanings simultaneously through the torso, face, hands, feet and the displacement of

12 FREIRE, Paulo; Pedagogia da Autonomia saberes necessarios prática educativa; 11ª. edição, Editora Paz e Terra, 1999; p. 50

the body in the air; always working together but rarely in unison, and conveys as one, the present, the past and the future. Any codi cation system demands a long period of observation and re-cording. A researcher can only try to establish control over movement after long practice, self-observation, scientific knowledge and observa-tion of other people. After this complex process, he/she awareness will certainly arise as to how little she/he really knows to attempt to control movement in any degree.

The nal Nota-Anna's objective is to open a possibility to the user to exploit the body expres-sion potential in its interaction with technology through the practical experience of recording and reading actual movement. In order to establish any control or reconstruct a real movement we need to explore much more the relationship between man and new technology, until it becomes natural to us. Nota-Anna is a proposal that respects the bio-logical organization of man in his integration with technology.

Incorporating computer vision and arti cial intelligence, Nota-Anna can be a powerful tool for movement analysis and creation. And, may be extensively used for those who cultivate this art. Luiz Velho, April 1998, Instituto de Matemática Pura e Aplicada, Rio de Janeiro, Brasil .

Analivia Cordeiro, 1998.

To watch the video, access

https://vimeo.com/47377980
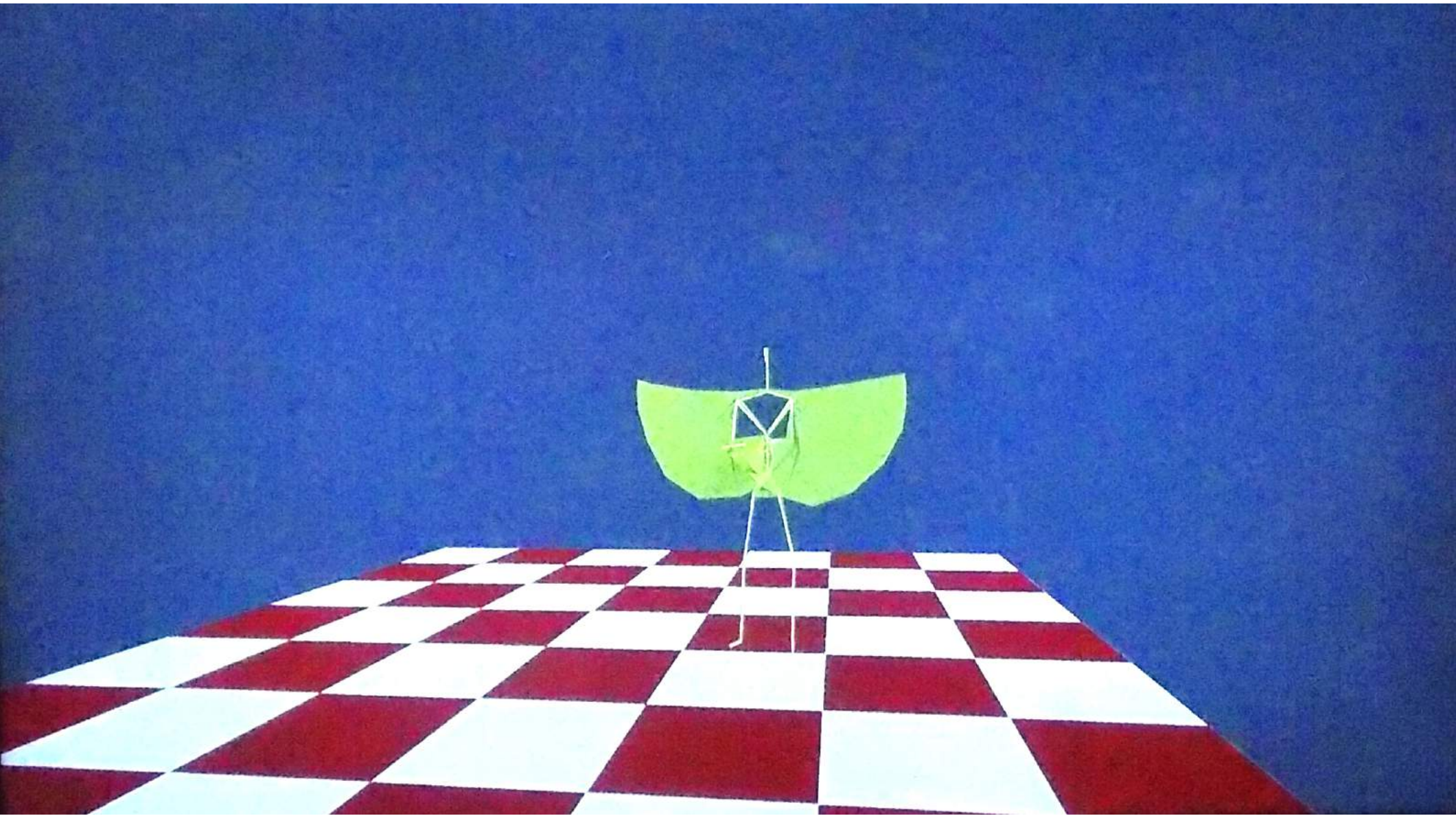
Nota-Anna release 5

A word can be written and transmitted. A sound can be recorded in many ways. An image photographed or painted, and displayed to an audience at any time. And the movement of our body ?

After performed it disappears or, if registered, is imperfect or difficult to read. A movement script, very faithful to the actual movement, could enable people to exchange their movements just as they exchange words, sounds, and images. This can undoubtedly change the world.

During experiments carried out at the Museum of Modern Art of Rio de Janeiro - Brazil, for visitors from countless countries and all age groups, we observed that people would let go and make movements that they would never do alone. Inhibited children and adults began to express themselves through this writing. The movement refined and developed in a playful way, making people overcome their physical and psychological limits. Hence the importance of capturing and visualizing the movement in real time.

motion capture at the Unforgetable Kicks exhibition at Museum of Modern Art of Rio de Janeiro, May/ August 2018

STANDARD CLASS BODY AWARENESS BASED ON NOTA-ANNA FOR INTERNET

Get ready to exercise.

PRESENTATION

1. This class is relaxing and at the same time, you get a whole body workout. Strengthen and relax your muscles, your mind and emotions. Enjoy.
2. During this lesson, try to feel your whole body. Close your eyes if you like, to feel the movement.
3. If you are with other people, try to not imitate their movements. Track how your own body feels and behaves in the execution of instructions.
4. Let your body move in the easiest possible way.
5. At any time during the lesson you can move around freely, if you feel the need or desire to move.
6. If you are tired during class, take a break and then continue.
7. If you want to stop at any time during the lesson, just, click nish.
8. This class may be repeated at any time.
9. If you feel any discomfort or joint pain do not insist in the movement.
10. It is advisable to drink water after this practice as it helps ush away toxins.
11. Do not take this class under the in uence of alcohol or any drug that affects the nervous system. If you have any health problems, consult your doctor before exercising.

PREPARATION

1. Clear furniture and objects away to avoid tripping, knocking or getting injured
2. Do not practice on carpet or any slippery surface,
3. Wear comfortable clothes that allow your body to move freely,
4. Wear non-slip socks or shoes that don't rub joints of pinch your feet,
5. Direct your concentration and attention to your own body.
6. Place your computer or mobile in a position that you can see the screen easily.

SKELETON

If you have any questions about the name of the joints, calmly observe the figure below and acknowledge these parts on your own body. Tip: to see more precisely the location of the joints in the figure, locate and touch your own body or in someone else's body and feel the joint we are talking about.

BODY OF PRACTICE

Choose what you prefer to do: read the instructions below, or access the video
https://www.youtube.com/watch?v=VttFcFk0byc

NARRATION OF CONTENTS

Before starting this physical practice you should read the presentation and prepare your workspace.

To familiarize yourself with the bones of the body, see the skeleton icon and identify which bones in your body that you might be curious about. Note where the ischia, the shoulder blades, and the skull are because we'll talk about them.

Sit on your ischia,

Let the weight of your body fall vertically across the ischia toward the ground,

Feel your shoulder blades opening sideways in opposite directions,

Close your eyes and look back without turning your head, gazing through your skull, to the back of your head,

If you feel the need, let your chin and your whole head tilt backwards a bit, without shrinking the back of the neck,

Feel the weight of your jaw,

Straighten your back without too much effort; naturally,

Join your hands, palms touching each other.

Hands rub each other lightly, gently feel the skin, in very small movements.

Bring your hands together up to your face. Place the palms of your hands over your eyes.

Slowly slide your hands toward your ears.

Take your hands away from the ears and rest them on your thighs.

Slide one hand around your neck, your opposite shoulder, your other arm to the tip of your other hand and continue reaching up the inside of the arm until your armpit,

Return the hands to resting position on the leg,

Repeat the same movement on the other side with the other hand,

Put your hands behind your neck and slide them behind the head, raising your arms,

Relax, lower your shoulders, and bend your elbows slightly, keeping your arms up,

With your ngertips, draw circles in the air, not worrying about technical perfection,

Now move your head freely as you desire,

Let your whole body move, even if only very small movements,

Close your eyes and remember the lines that you just drew with your fingertips, and at the same time, continue to move your arms freely as you desire,

Rub your hands together gently,

Lightly cover your closed eyes and feel the warmth of the palm of your hands,

Stretch your hands and feet, and if you can, the whole body,

Inhale deeply and exhale contracting the abdomen.

Yawn if you want.

Good morning or good night.

12. Scapula-humeral joint right

24. Bottom tip of the sternum

13. Tip of the right elbow

2. Hip joint right

14. Right wrist

15. Tip of the right hand

3. Center of the right patella

4. Midpoint between the two
   malleoli of the right side

5. Metatarsal-phalangeas rights joints

6. Tip of the right foot

22. Rear top edge of the skull

21. Joint rst vertebra, skull

20. Seventh cervical vertebra
   or higher sternum tips

16. Articulation scapula-humeral left

17. Tip of the left elbow

1. Navel

7. Left hip joint

18. Left wrist

19. Tip of the left hand

8. Center of the left patella

9. Midpoint between the two malleoli of
   the left side

10. Metatarsal-phalangeas joints left

11. Tip of the left foot

THE SKELETON

Frame of Pelé's bycicle kick video, 1968

Image of Pelé's bycicle kick video processed by Nota-Anna

ARCHITECTURE OF MOVEMENT, 2006/2015

The ethereal movement becomes an image which can be observed from different angles. Continuing the development of Nota-Anna, still images were obtained of the movement of bicycle style kicks and volley, from Pelé video, 1968. The original information is two-dimensional, they were taken from a video, and transformed into three-dimensional through processing Nota-Anna software. Software authors: Analivia Cordeiro and Nilton Lobo.

To watch the video, access

https://www.youtube.com/watch?v=XAfV-d8cVFk

Frame of Architecture of Movement video, 2014
Image of Pelé's voleo kick video processed by nota-anna

ABOUT POETRY MOVEMENT OF ARCHITECTURE

The volley and the bicycle football kicks performed by Pelé were studied by the Nota-Anna notation system. Any serious research on movement should come from actual experience and it is only im-portant if, it reaches the individual's heart in any way, presenting moments of everyday life, making it more complete and highlight the subtleties of the action.

A proposal of a motion notation occurs at the maturity of a study. A researcher can only try to establish control over the movement after decades of practical experience, self-observation, scientifi c knowledge and observation of others. And after this study, as complex and time consuming it may be, the researcher certainly knows how little the knowledge of movement is to wish to control it to such a great degree.

I proposed The Hidden Beauty of Football prac-tice and study from many years of observation, a way of preserving the memory of fl eeting beautiful movements, which should be unforgettable.

Those two kicks together with a kick by Bruce Lee resulted in 17 sculptures presented at the exhibiiton Unforgetable Kicks (see photos at page 255). Dr André Macedo, member of Brazilian Academy of Neurology, reports his perspective on the exhibition: "In a single work the artist manages to bring together the sequence of movements, that is its dynamism. It is pure neurology. The complex movements have a code, which we call an engram motor. It is as if an aritmetic calculations are stored and represented in a certain area of the brain. You cannot recreate, humanly speaking. I have the impression that this motor engram is present at the exhibition."
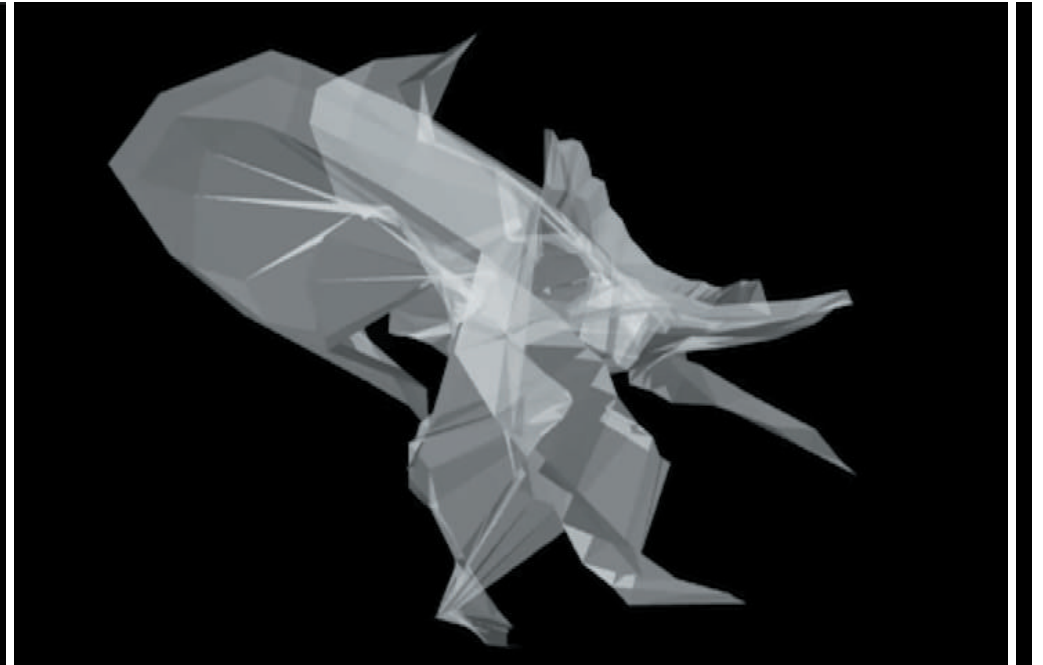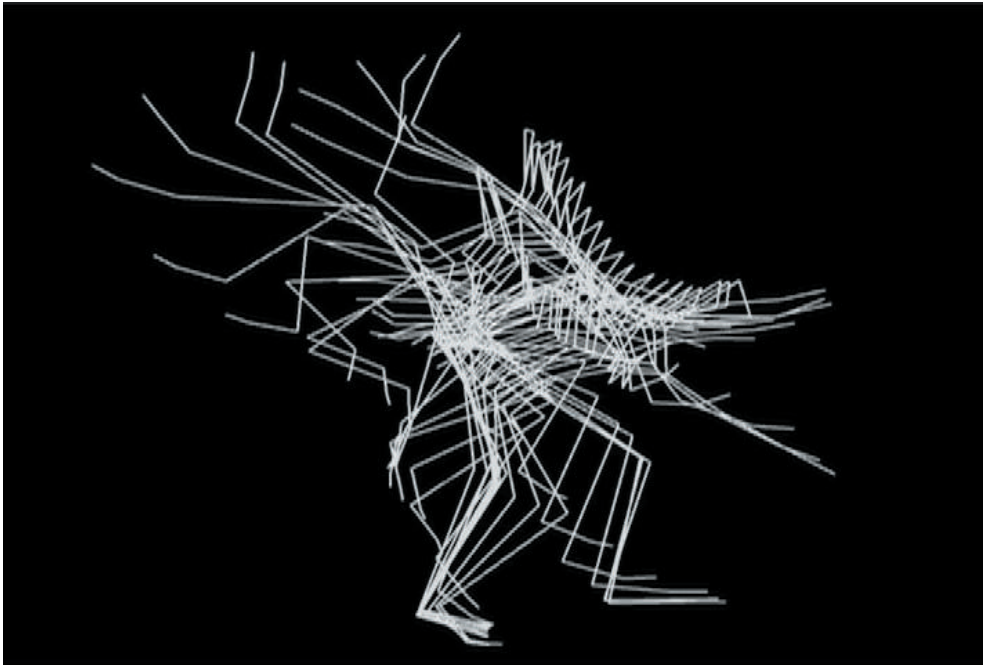
Images of Pelé's voleo kick video processed by Nota-Anna
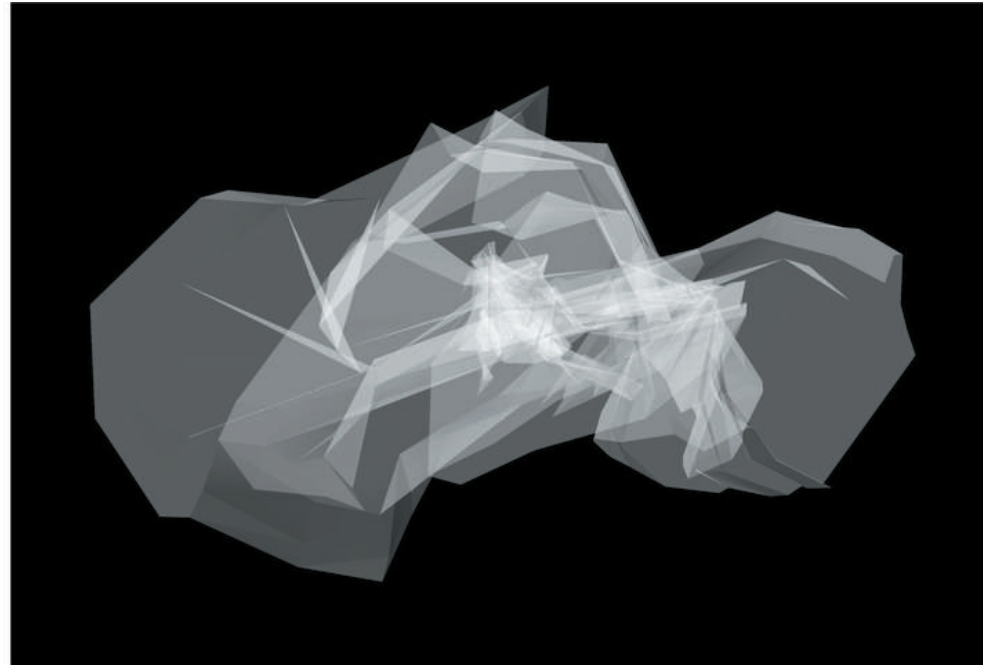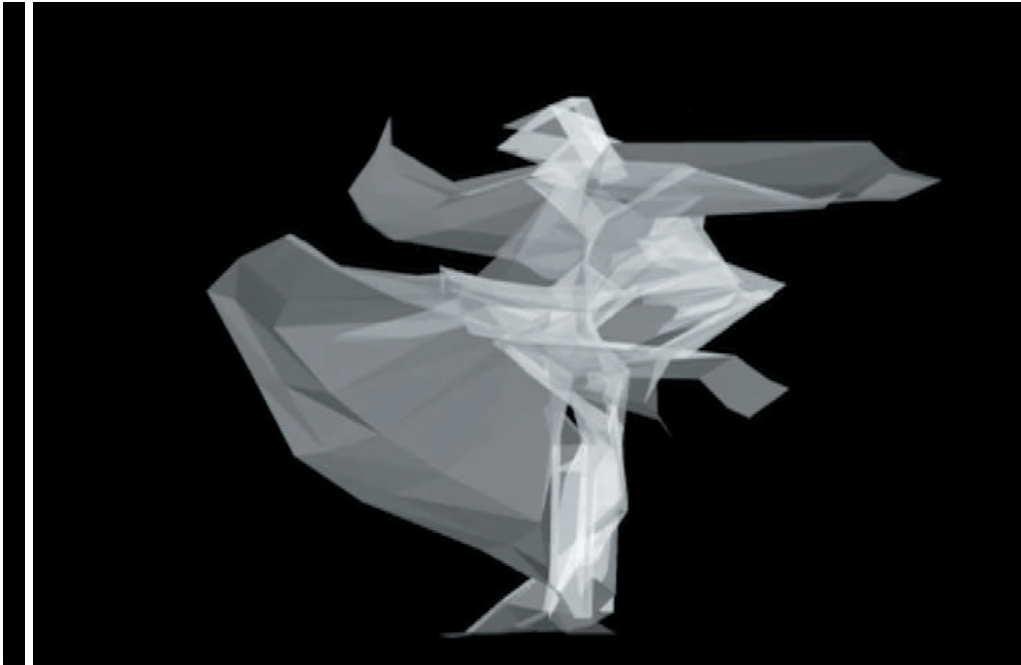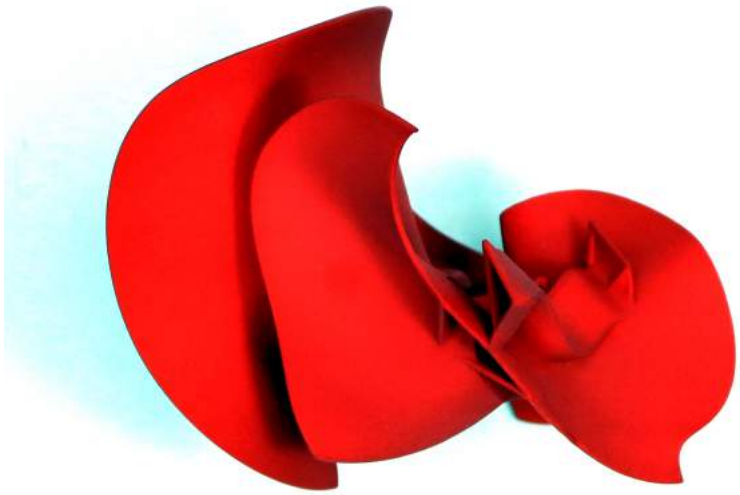
 Continuum: these are flexible, as soft fabrics like pure silk that define movement in space. The sculptures of this group are: Poetics of the Human Movement, (In) visible moving I, (In) visible moving II.

(in)visible moving I, 2016 (up)
Red Poliamide, height 26 cm, top and side views

(in)visible moving II, 2016
Alumida height 26 cm, Side and top views

SCULPTURES OF ARCHITECTURE OF MOVEMENT, 2015

The movement is a drawing in space. Outlines an ephemeral way giving an impression in people who watch this move.   The movement disappears, but the impression stays in the memory.

If the move is surprising, gifted with beauty and ef ciency, the impression is of admiration. People talk, trying to describe it and explain it with emotion. And that is how some movements are perpetuated in the history of man as feats.

This is the case of the bicycle and volley kicks ex-ecuted by Pelé. Unforgettable moments, reminded in a poetic form only. This project of objects intends to turn movements in a material reality: sculptures condensing the movement.

Between 2015 and 2017, seventeen sculptures were produced. A project elaborated directly on the Nota-Anna notation of three movements: the bicycle kick executed by Pelé, recorded in video, in 1958; the volley kick performed by Pelé, recorded in video, in 1958; and the yokogueri kekome hit performed by Bruce Lee, recorded on film in the 1960s. In the Architecture of Movement video, one can see the graphical variations of Nota-Anna for Pelé's kicks. Looking at those images together with the sculptures, the close relationship between movement and sculpture becomes clear: these are the material condensation of the movement with great accuracy. These sculptures were made in 3D printers with diverse materials, always in small size, between 12 and 26 cm in height.

The text of the exhibition Unforgetable Kicks: Nota-Anna began 36 years ago, in order to find a writing for the human movement that could be read, understood and interpreted by anyone, layman or expert. Due to the characteristics of the technology of each epoch, and always, preserving the biological structure of our body and our free expression; the results were varied in each phase of this research, suffering many limitations or surprising successes. Its evolution shows that the result has an artistic and technological concern, and above all social and human, developing in people a positive and constructive psychological and emotional interrelationship.

Sculpture, which is the movement itself condensed into a matter object, signifies a new possibility in understanding the movement and how we express ourselves. We can see that what we call abstract in the plastic arts can be the revelation of an immaterial reality that exists. Still unknown to our aesthetic standards.

In "Unforgettable Kicks" we present a high-quality result so that the public can live a new dimension of their daily life and know their own movement. Think and analyze, and at the same time, be spontaneous and create. Have fun.

February 2019
Analívia Cordeiro
Nilton Lobo

Tribute to Oskar Schlemmer III, 2016 Dark Blue Poliamide, height 26 cm, front and side views

Tribute to Oskar Schlemmer I, 2016 Red Poliamide, height 26 cm, front and side views

Tribute to Oskar Schlemmer II, 2016 Yellow Poliamide, height 26 cm front and side views

there are invisible threads that delineate the trajectories of the movement, and it seems that the straight lines were thrown onto these trajectories, stuck together, and became supported by the trajectory. I called these sculptures Tribute to Oskar Schlemmer because they resemble one of his dances in which sticks are tied on the limbs of the body, with a length greater than the member itself, making the dance appear like straight lines in movement. The sculptures of this group are: Tribute to Oskar Schlemmer I, Tribute to Oskar Schlemmer II, Tribute to Oskar Schlemmer III.

Body: the movement sequence captured by Nota-Anna and transformed in stick figures of the body. The sculptures of this group are: Materialization of Sight I, Materialization of Sight II.

Materialization of Sight I, 2015 White poliamide, height 26 cm side and top views

Materialization of Sight II, 2015 Poliamide, height 26 cm top adn side views

The zombie version of the entire polygons. A percentage of the polygons is removed at random, without harming the stability of the sculpture. The sculptures of this group are: I Saw It, Visible Empty, Organic Kaleidoscope.

I Saw It 2016
Black poliamide, height 26 cm

Empty Visible, 2016
Black poliamide, height 26 cm

157

Organic Kaleidoscope 2016
Black poliamide, height 26 cm

Concept of Abstract I, 2015
Poliamide, height 26 cm,
Side, front and top views

Partial Continuum: some body articulations members have a path in space endowed with great beauty, like the left leg with knee and foot articulations in the volley kick performed by Pelé. In these cases, I took these members separately and transformed them into sculptures. The sculptures of this group are: Gold Kick, In-Out.

In Out, 2016
Gold Plated Brass, 12,5 cm
front and side views

Gold Kick, 2016
Gold Plated Brass, 12,5 cm
side and top views

Materialization of the Geometry
of Movement, 2016
Gold Plated Brass, 12,5 cm
front nd side views
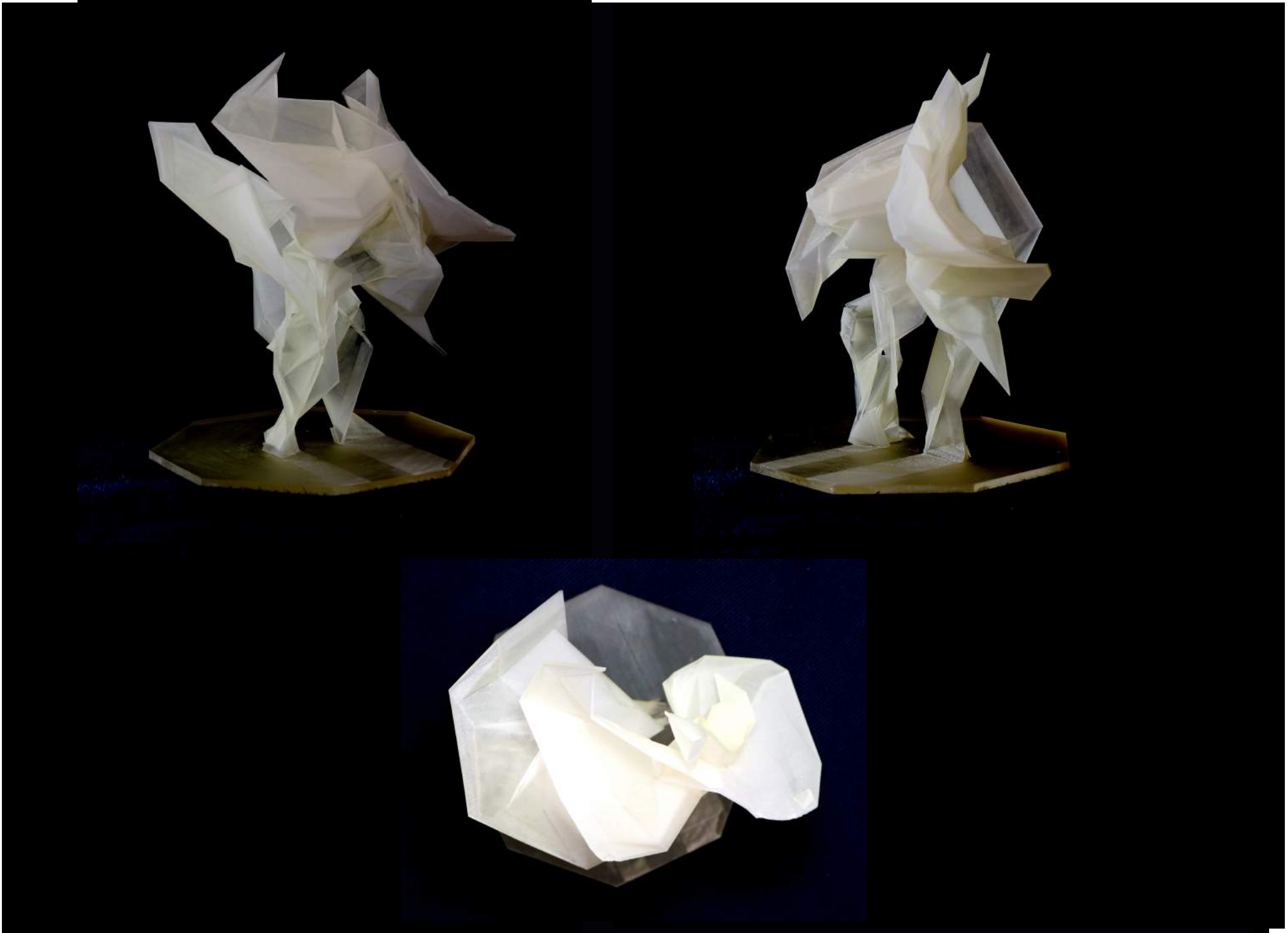
Ephemerality of Movement, 2016
Resine, height 26 cm Side, diagonal and top views

Another Cpncept of Abstraction, 2015
poliamida Height 26 cm, side, diagonal amd front views

Poetics of Movement, 2015
Alumida, height 26 cm diagonal view

ANALIVIA CORDEIRO

POETICS OF ARCHITECTURE OF MOVEMENT: FREE THOUGHTS

The world is both richly strange and deeply simple
Morrison, Phillip; *The Modularity of Knowing* in Module Proportion
Symmetry Rhythm, George Brazziler, New York, 1966, p. 19

The result of my recent research about human movement consisting on the space visualization of the football player Pelé movements raised three questions: can the abstract paintings be similar to scienti c images? Or similar to microscopic images of natural life?

Have they been made from an exceptional ability of the artists to visualize the microscopic realm of the material world even without knowing the real images the microscopic ones , that we know today?

Undoubtedly these art works were produced by the human capacity of abstraction[1]. Abstractionism is the theory that the mind obtains its concepts by abstracting them from concepts it already has, or from experience. For example, one may abstract a generic concept like vegetable' from the already possessed concepts of its instances like carrot, broccoli, onion, etc.

Abstraction in mathematics is the process of extracting the underlying essence of a mathematical concept, removing any dependence on real world objects with which it might originally have been connected, and generalizing it so that it has wider application or matching among other abstract descriptions of equivalent phenomena.

Abstraction in philosophy is the process in concept formation of recognizing some set of common features in individuals, in order to form a concept of that feature. Conceptual abstraction may be formed by ltering the information content of an observable phenomenon, selecting only the aspects which are relevant for a particular purpose.

In art, abstraction indicates a departure from reality in depiction of imagery. This departure from accurate representation can be minimal, partial or complete. Abstract art uses a visual language of shape, form, color and line to create a composition which may exist with a degree of independence from visual references in the world [2]. Even art that aims for verisimilitude of the highest degree can be said to be abstract, at least theoretically, since perfect representation is likely to be elusive. Therefore, abstract art, non gurative art, nonobjective art, and nonrepresentational art are loosely related terms.[3]

1 Thinking in abstractions is considered by anthropologists, archeologists, and sociologists to be one of the key traits in modern human behavior, which is believed to have been developed between 50,000 and 100,000 years ago. Its development is likely to have been closely connected with the development of human language, which whether spoken or written appears to both envolve and facilitate abstract thinking.

2 ARNHEIM, Rudolf; Visual Thinking; University California Press, USA 1972.

3 Clarifying the statement above, the theory of duplicity of expressions in art works: the rst, conceptual, naturalist; the other, visual, intuitive. Relations between these two arts, the art itself, have never been properly

The trend toward abstraction in art coincided with advances in science, technology, and changes in urban life, eventually re ecting an interest in psychoanalytic theory. Abstraction in art was manifest in more purely terms, such as color, freedom from the context, and the reduction of form to basic geometric designs and scienti c principles of form.

The relationship between art and Science has been the subject of constant research which was documented thorughout the history of civilization. Abstract art established a closer relationshio between Science and art, as other artistic movements of the past like the Renaissance.[4] L' art doit casser d' tre imitatif pour découvrir de nouvelles formes .[5]

As free toughts I will point out the visual similarities between the scienti c images obtained through electronical devices and the contemporary works of art, mainly abstract and concrete ones. The following visual examples are far from the intention of an art critic statement or any kind of thesis. After looking at the following images, I ask again: can the abstract paintings be anthropomorphic? Or similar to natural life images?

Have they been made from an exceptional ability of the artists to visualize the microscopic realm of the material world even without knowing its real images the microscopic ones , which we know today?

November, 2015

clari ed, and could not be. This artistic theory is based on a scienti c theory of matter by studying the relationship between nature and thought, according to the categories of time and space in the process that goes from sensation to thought, distinguishes two natures in nature: the causal and the apparent. This theory was superseded by the relativistic concept of matter, like the theory of duplicity was overcome by the concrete art   an extension of abstraction   which establishes a relationship with nature that solves this duplicity. Cordeiro, Waldemar; Arte Moderna e Naturalismo, Folha da Manhã, São Paulo, 1951 .

4 The trend toward abstraction in art coincided with advances in science, technology, and changes in urban life, eventually re ecting an interest in psychoanalytic theory.

5 Moscou manifest, 1920.
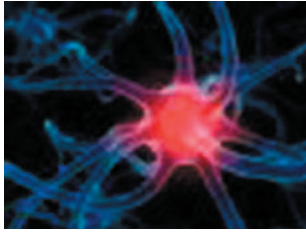
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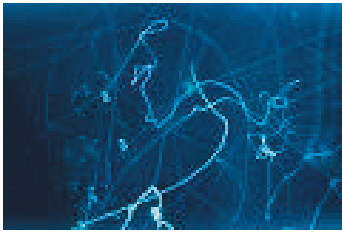
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1 Alzheimer's Disease, arterial hypertension, and diabetes might
  have genetic components, but environmental factors could be the
  tilting force for a person to develop one of these diseases.
2 Lázlo Moholy-Nagy
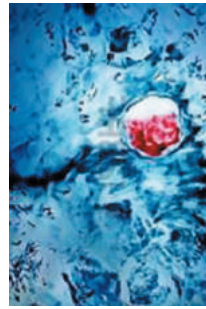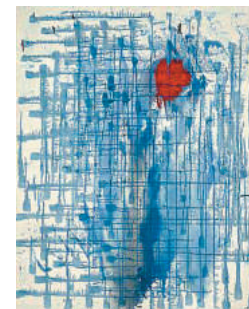
3   4

3 Microscope view of bacteria
4 Rubens Gerchman
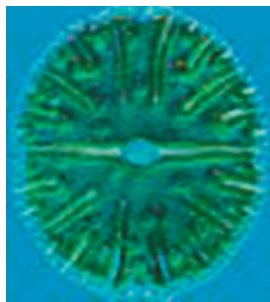
5   6

5 This false-coloured scanning electron micrograph shows caffeine crystals
6 Theo Van Doesburg

7   8

7 Microscopic image of water droplets.
8 Juan Miró
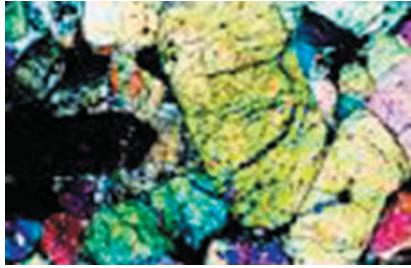
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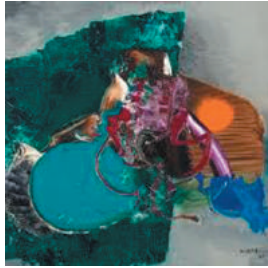
10

9 Meteorite from Mars
10 Manabu Mabe

11 Microscopic bacteria: Volvox carteri consists of 2000-4000 termi-
   nally differentiated somatic cells that are located on the surfa-
   ce of the spheroid, and 16 reproductive cells gonidia inside
   the spheroids. Research by Prof Dr Armin Hallman
12 Robert Delaunay
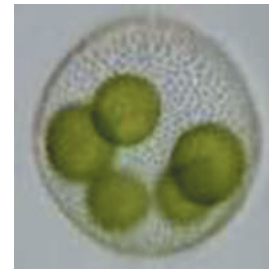
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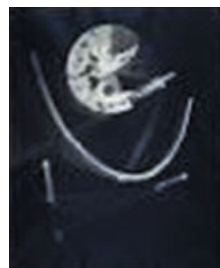
14

13 The Ca izar formation is chacterized by the development of u-
   vial sequences usually incomplete related to the development
   of channels and bars, interrupted by reactivation surfaces and
   erosional surfaces.
14 Lázlo Moholy-Nagy

15 Caffeine crystals: this image shows a coffee bean. Credit: The
   Wellcome Awards
16 Marc Chagall.

15

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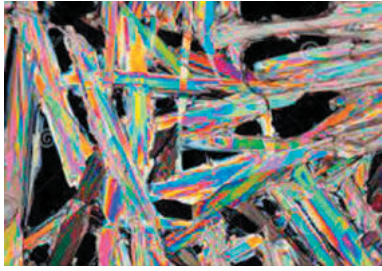
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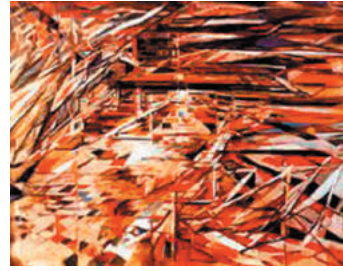
18

17 Microscopic View of potassium nitrate crystals in polarized light
18 Maria Helena Vieira da Silva

19 This image obtained through an electron microscope
   barrido SEM shows the cells
20 Josef Albers
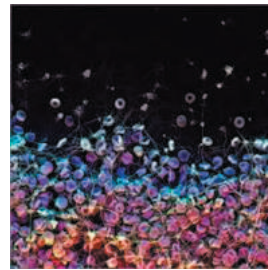
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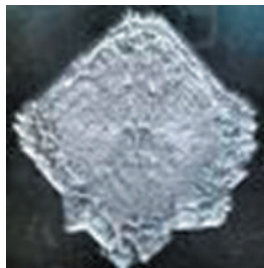
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21 Dragon Ballin
22 Robert Rauschenberg

23 Motion trace image of a kick of the player Pelé 1968
   by Analivia Cordeiro
24 Antoine Pesvner
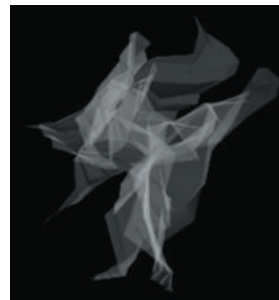
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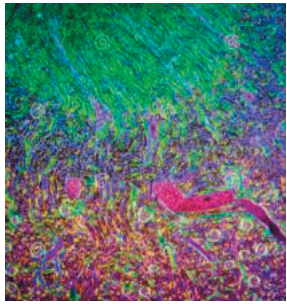
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25 Cells from a human kidney section
26 Paul Klee

27 Neurons magni ed 40x Jan Schmoranzer
28 Wassily Kandinsky
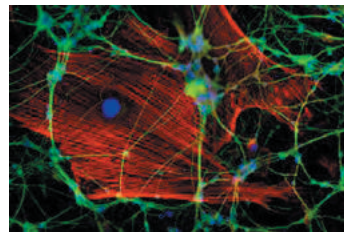
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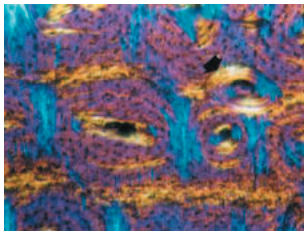
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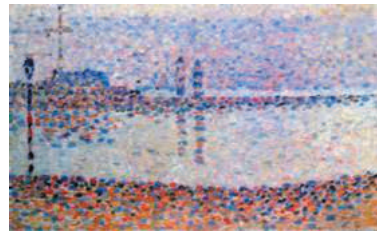
30

29 The growth of the cortex. The primary osteons are seen.
30 Georges Seurat

31 Cell wall has primary and secondary walll called bordered pits.
   In secondary bordered pits primary wall becomes thinner and
   disappears high up to the bordered pits in 0concentric lamellae
   around a osteonal duct. Chilean Journal of Anatomy
32 Hélio Oiticica 1958
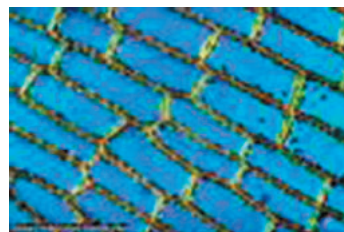
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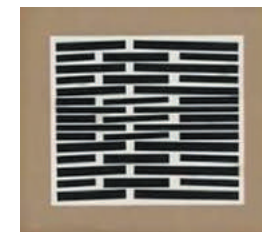
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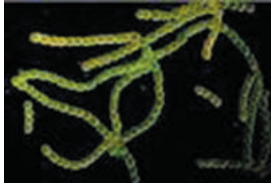
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34

33 Microscopic algae even are not plants, cyanobacteria are one of
   the main organisms capable of photosynthesis
34 Henry Matisse

35 Common blue dragon y eye Enallagma cyathigerum microscope
   image captured by Igor Siwanowicz, Max Planck Institute of Neu-
   robiology Germany .
36 Julio Le Parc
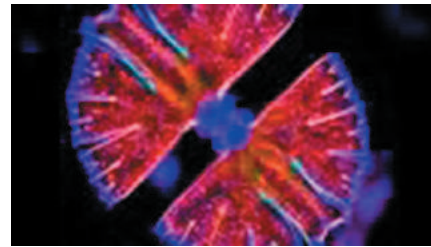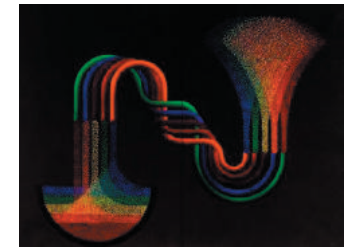
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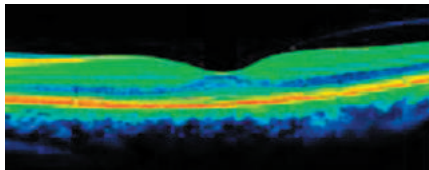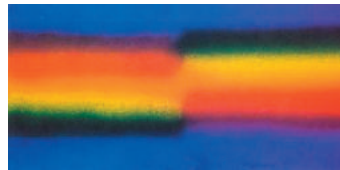
37   38

37 Optical coherence tomography OCT of the retina is high pre-
   cision imaging exam, that uses light waves to generate section
   images of ocular structures.
38 Waldemar Cordeiro

39 Bacteria under microscope lens. Stock images
40 Waldemar Cordeiro
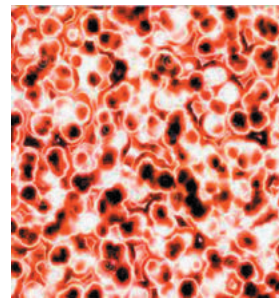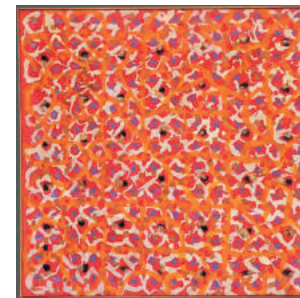
39   40

Analivia and a teenager indian

4   ANTHROPOLOGICAL EXPERIENCE

Photos and a video, originally shot on Super-8, resulting from an accomplished motion study on a Kwarup ritual of the Kamaiurá tribe in Upper Xing , in the State of Tocantins, at that time State of Goiás, in 1975. The photos were taken by Analivia Cordeiro and Silvio Mendes Zancheti. Later they were processed and edited by Analivia.

The photos recorded people in movement, not posing, with the intent of understanding the body in motion. The recorded scenes are of everyday life of the tribe as well as all stages of this ritual: the destruction of Apenap, burial of the dead to be honored, cutting a Kwarup tree trunk, using the root of timbó for shing, painting Kwarup totems representing the dead to be honored, only recorded on video, the presentation of the girl, the Kwarup to the Uruá flute dances.

To watch the video, access

https://youtu.be/NF6w-98WOO0

Analivia and the chief Tacumā

ARLINDO MACHADO

A REFLECTIVE LOOK AT INDIGENOUS CULTURE

The relationship between the native Indians of Brazil and photography has never been an easy one. For a long time, the native peoples refused to be photographed, for mystical-religious reasons. They believed that each individual is covered by a number of auratic shrouds, which some tribes call carom, and that every time a camera photographs an Indian, it is stealing one of these shrouds, leaving the individual poorer or deprived of soul. In the case of the Kwarup festivity held regularly by various tribes from the Upper Xing River region since time immemorial, white people were not allowed to attend initially, but were later admitted on condition that they did not take photographs or make lms. Much effort in terms of comprehension and trust on both sides was required to overcome these obstacles so that we now have not only images of everyday life but also of the sacred Kwarup festivity. Nowadays, native Indians not only allow photographs to be taken without fear of losing their soul, but even appear to pose for cameras, as may be seen in Analivia Cordeiro's photographs. While not abdicating her manifest artistic purpose, Cordeiro's photographs are also eloquent examples of anthropological research into the life and culture of the Upper Xing

peoples. In 1942, the famous U.S. cultural anthropologist Margaret Mead introduced the idea of a visual anthropology that authorized this science to use images and sounds as research tools for its methodology, which had previously been restricted to written culture alone. Anthropologists soon became photographers and lmmakers; they learned to use cameras and edit images. Even the Indians themselves, from a certain point in time started to photograph and lm their own lives. But Cordeiro's case was slightly different. Coming from an artistic background, yet with solid anthropological knowledge, she cast a different gaze on the issue of working with images and sounds of indigenous peoples. This may be seen in the hybrid exhibition that consists not only of photographs and a video, but also sculpture-installations that the artist created while drawing from Upper Xing cultural concepts and images. This heresy , let's say, would never be accepted in the severe academic circles of traditional anthropology. Photographing and lming the native Indians was not easy. A festivity such as Kwarup involves everybody in the tribe; many things are happening at the same time in different places and everything is equally important.

But cameras cut out sections; they can only show one thing at a time within a limited framework in terms of length. Therefore, it takes a certain intelligence to cover it all through a succession of part-images that skilled editing may bring together successfully. Cordeiro realizes that a documentary cannot cover everything about the indigenous peoples' lives, or even the sacred festivity, and she says so in one of the comments taped in video format, thus leaving certain gaps and openings for viewers to fill with their own imagination. One point of view has it that allowing white people to photograph and film may be a conscious political gesture: by posing for the camera to dramatize their culture, the Indians would be asserting their identity firstly for themselves, and then for the nation and society to which these audiovisual statements are ultimately addressed. Perhaps the media invasion television, in particular is being thrown into reverse: as soon as indigenous culture starts to coexist with an alien culture's images and procedures, the contrast may become more noticeable and the Indians may be made aware of their own uniqueness as a necessary condition for subsequent self-defense and self-assertion.

These are the issues that arise from Analivia Cordeiro's Manuara exhibition, which beckons viewers to admire the native Indians for their own beauty and the exuberance of their surroundings and, at the same time, ponder the meaning of this ontological difference. In the game between those living in the natural wilderness and those living in the big cities' concrete jungle, who ends up winning and who ends up losing?

July 2014

ANALIVIA CORDEIRO

MANUARA

Living for a few months in a preserved Indian village and communicating through gestures with a tribe in which only three individuals spoke a few words of Portuguese was an unforgettable experience for me. For 39 years, I have kept records of this visit, waiting for an opportunity to display them in proper manner. Far from an intellectual experience about which I could write extensively, that was a sensory immersion. I had the opportunity to meet a group of people who actually knew what harmony was, who really knew what respect was about, who really knew how to listen, observe, wait for their turn to speak up, and be concerned with making themselves understood. Now I am showing these images publicly so people can see what those native men, women and children looked like, and how their everyday life in the village was. I also want to show their facial expressions, the equilibrium of their body muscles, and their harmonious movements that I captured on camera. This is all the product of their existence, their everyday life, their way of living. Unfortunately, I regret to say, this all belongs in the past, it dwells only in memory, because I have no doubt that the children and grandchildren of these native Indians no longer retain the same physical strength, self-confidence, personal dignity and preservation of their culture. At this point, a couple of questions come to mind: Who are we to judge or assess their civilization? In view of all our social issue, do we know any better

than them? Are we superior to them in any way? I honestly have never experienced anything so profound. They were so sensitive, gentle, perceptive, considerate, friendly and generous I am saying this after 39 years, practically a lifetime. Thus I have named the exhibition Manuara, which means remembrance in the Tupi-Guarani language. In 1975, I began to study the body language of the native peoples of Brazil. I was a dancer and researcher of human movement who, not withstanding my young age, had a sound knowledge basis in this eld. Body work is something we start very early in life. Having started my studies at age seven, by the time I turned eleven I was already dancing in stage. As regards my repertoire, I thought I had to incorporate into it a deeper understanding of the body language of the Brazilian Indian. To this end, I worked on a project to record a native ritual that lasts aproximately two months: the Kwarup ritual. I submitted the project design to Professor Lux Vidal at the University of São Paulo and obtained her approval. Then, thanks to the Brazilian Air Force, I managed to reach the remote Kamaiurá tribe in the Upper Xing River region. I invited a friend, Silvio Mendes Zancheti, to accompany me in this mission, from which we returned with plenty of photographs and super-8 footage. At the time, I sent the University of São Paulo an analytical report on my observations and on the body language of this tribe, together with an edited lm. That is

how far as I went with the subject; my life then turned to another direction as video artist, computer dance researcher, and designer of human movement notation software. I took a path toward understanding the signi cance of technology in today's society. This is how this material ended up stored for many years, until I decided to show it this year. To this end, I re-edited the footage and restored the photos, not knowing which of us took which picture. I have turned this into a personal project that involves manipulating these images, printing them on tree trunks and dried leaves, using natural materials from Brazil such as iron, sand, earth of different colors, stone, wa-

ter, tree bark, seeds, wasp hives and live plants. In the composition of these pieces, I used my hands as work tool. I also used shards of mirrors that so fascinated the Kamaiurá in our first encounter. I have used shards because they convey a symbolic meaning of what our civilization has done with the culture of Brazilian natives. It is cruel to these peoples to ignore their contribution that, more even than a historical contribution, is a human contribution, and to disregard the knowledge they detained until recent times. This is really a crime, an absurdity. For me, this exhibition is an act of pure and true love that by far transcends the aesthetic experiment.

May 2014

Analivia playing with the kids

Dwelling
A woman is resting inside her dwelling

Boys in their dwellings
During days of festivities when women should stay at home, boys cook

Mornings at the lake
They wash themselves in the morning and take water home

ANALIVIA CORDEIRO

AN EXPLANATION OF KWARUP RITUAL

A short description of the Cycle and Ritual of Kwarup. The Ritual of Kwarup is considered the most important ritual of the Upper Xing culture. This culture is comprised by the Kamaiurá, Aweti, Waurá, Yawalapiti, Mehinako, Karib, Kuikuro, Kalapalo e Nahukwa-Matipu tribes. Most of them inhabited this place for centuries and only in 1884 did they meet white Europeans. These photos show a Ritual of Kwarup registered in 1975 at the Kamaiurá tribe.

The meaning of this ritual starts with the mythology of the Upper Xing culture. The myth takes place in Murená, considered the center of the world by the Kamaiurá tribe. Mavutsini n is ananthropomorphic mythical entity, who existed since their early days. The myth depicts Mavutsini n in search of a rope to make abow. Mavutsini n was trying to steal the rope, that belonged to his nephew Yayat, a jaguar, who was potentially dangerous. Mavutsini n was confronted by Yayat, who tried to kill him. So Mavutsini n offered his daughters for Yayat marry in return for his life. The daughters were Yayat s cross-cousins. Cross-cousin marriages are favored in the Upper Xing culture. By offering his daughters, Mavutsini n reverses the situation turning the antagonism into an alliance. The daughters of Mavutsini n refuse to marry the Yayat because they were scared. Mavutsini n then decides to create two new daughters: he cut two trunks of Kwarup tree, painted them, stood them up, and sang to them until they came alive. Then,

he married these two new daughters to the jaguar. The youngest daughter gives birth to Kwat and Yaí, the Sun and the Moon. The oldest daughter gives birth to twins, the cultural heroes of the Upper Xing tribe. They were responsible for the zoological and geographic organization of the Upper Xing . While Mavutsini n was responsible for the social structure of this culture.

Mavutsini n kept making people from tree trunks, until a man had sex with a woman during the ritual, braking the protocol, of bringing back the spirits. From that event on, Mavutsini n , kept the tradition of the Ritual of Kwarup for the head of the tribe family members who died. The purpose of this ritual is to remember the dead and to continue the cycle of life, introducing young girls who have become eligible for marriage.

The Cycle of Kwarup comprehends celebrations between two Rituals of Kwarup. After the burial of the dead. Three days after the burial, a low fence of trunks, apenap, is built around the sepulture. Then the maraka'ip are called to play and sing, and they are paid with food and cotton thread. Then the Cycle of Kwarup begins lasting from six to eighteen months. During this period, every afternoon Dance of Kwarup is performed and there are Huka-Huka ght training while the Flute Uruá Dance is performed all day long. During the dry season, the head of the tribe meets the other chiefs to decide on a date for the big shing event, for the Kwarup rituals.

At this point the preparations for the Ritual of Kwarup begin. The apenap is destroyed to prepare the site for the Ritual of Kwarup. The men go into the forest, where the Kwarup logs are cut and hidden from the women. Each dead male from the chief's family will have a trunk transformed in a kwarup.

To provide food to the invited tribes, the men go on long   shing trips, far from the tribal village. They weave their net with vines and lace them with tevere, a substance that attracts   sh. Before throwing the nets into the water, they pray to it using their magic potions. At night they practice a ritual for protection from alligator bites and stingrays. They sleep in hammocks in the forest.

Next day, they throw their net in the river, and they place heavier sticks at the bottom and bamboo rods at the top of the net, in order to keep it vertical. They drag their net, cornering the   sh for many hours until they get to very shallow waters. Before killing the   sh, the shaman   spiritual leader   sinks a timbó root into the water. This makes the   sh dizzy and they   oat up to the surface and then they are speared. They smoke the   sh in the forest before taking it back to the village.

As the   shing venture was successful, the pareat   messengers   invited the Waurá, Yalapiti, Kalapalo and Kuikuro tribes. Meanwhile there is

the ongoing Flute Uruá Dance and Dance of Kwarup. Two or three days after the pareat return, they dig holes where they will stand each kwarup upright, when it is painted and decorated. While kwarup is being painted, women stay home. So the boys and men have to cook. When the painting is   nished, the women are called to decorate the Kwarups. Then the Kwarup logs are placed where the apenap were, the women cry throughout the night, in a ritualistic way, to prevent the dead from returning. Exceptionally the dance of Kwarup was in the morning as the maraka'ip sang and played.

The day after painting the Kwarup trunks, the tribes enter the village. When the guest tribes arrive, the pareat offer food and a place to sleep, each tribe has its place. Each chief sits on a stool called apikawayat. The Hoat Dance is performed   rst by the invited tribes and after by the host Kamaiurá tribe. After they announce the Huka-huka   ght competition between the tribes. After they dance the Flute Uruá Dance the introduction of the girls who were in reclusion, now women and as future mothers representing the continuation of the cycle of life.

In the end, the kwarup trunks are thrown in the lake or body of water near the village, and the tribes exchange goods before returning home. The next day, a new Cycle of Kwarup begins.

Apenap

It is a low enclosure fenced in by tree trunks.That traces the space which is where
their revered dead are buried at the center of villageunder the enclosure

Dance of Uruá flute

The confined girl that stayed in her dwelling during one year to learn what one needs
to know so as to become a woman. She can now go out to dance behind the ute player

The dance of Kwarup
During the cycle they performed every late afternoon

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Fishing camping

The camping area is near the dry arm of the river. To arrive there we travelled
for two hours by canoe and walked three hours through the jungle

Peeling a tree

To prepare the   shing nets they peel the trees

Making the net to fish
The barks of the tree are braided by the lianas to make the net. The three nets from the bark of the trees are very long, and take up quite a large amount of space

Casting the net into the river
So as to cover the whole width of the river three nets are cast to the river

Praying during fishing time
After casting the nets into the water, they join in collective pray for good luck. Later on, the spiritual Chiefs gather at sundown to smoke and to place offerings to the center of the river

Pulling the net

Pounding the root of timbó in the water

The spiritual Chief immerses the root of the timbó in the water to anesthetize the sh, which then surfaces and is captured. After plunging the root of timbó in the water, they remove it and await its results

Man fi shing

**Warming our backs
in the morning**
It's cold in the morning men
start a fire in the center of the
village to warm their backs

**Presentation of the
Huka-Huka wrestlers**
During Kwarup festivities,
one of the main moments
is the competition of the
Huka-Huka wrestling

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Wrestling Huka-Huka
During Huka-Huka wrestling the opponents
have to throw each other off balance without
losing body contact. To hold on to the thigh
of the opponent is a sure hit to win the
wrestling i.e. to throw him off balance

Huka-Huka audience
Men are the audience of the wrestling
match during the Kwarup celebrations

Resting
There is always time, space for their body's
to renew themselves on a day to day basis

Chief Yawapiti
Dignity and simplicity

LEAVES AND TRUNKS, 2014

Six months of research, brought an interesting result: the impression of Indigenous People Kamaiurá photo images on dry leaves or logs, simultaneously showing the photo image, the structure of the leaf and the texture of trunks of wood. The nish on the image is natural material, without civilization interference. Printing and setting image using technological resources.

5   TEACHING

The art of teaching note is different from art education. Different of therapy. It is life, fundamental part of building our daily lives: it is knowledge.

To watch the videos, access

https://www.youtube.com/watch?v=7bS7R1Xj3Oc
https://www.youtube.com/watch?v=xTVT9EImpo8

ANALIVIA CORDEIRO

THEORY OF LABAN, 1999

This chapter sets out the basic ideas of this system, not going into details or subtleties. This is a subject with an extensive bibliography published. Before the theoretical explanation, I would like to position Rudolf Laban in the European environment in which he lived.

A HISTORICAL VIEW

Rudolf Laban was born on 15 December, 1879 in Bratislava. At the age of 15, he outlined a description of the body movement in its entirety, not restricted to dance, but extending the work to everyday actions, of any human movement. His career was de ned when he wrote: When my body and soul move together they create the rhythm of movement; and so I danced .

His study was in uenced by an eclectic training and extensive travel while he accompanied his father, to become acquainted with different types of people and cultures, in Czechoslovakia and North Africa.

His father, an of cer in the Austro-Hungarian army, hoped that his son would follow the same career, but after a brief internship at the military school, Laban opted for arts studies. At 21 he left

for Paris where he attended the cole de Beaux-Arts 1900/1907. He showed a special interest in stage design, drama and dance, costumes and scenery, theater architecture. During this period he outlined the idea of dance writing that became the Kinetography or Labanotation .

Laban sought an art that involved action and people. He was not a lone artist, on the contrary, he sought an art that required the active participation of a group. His deep interest was human movement form, expression and the space around.

Following this trend created in 1910, the Dance Farm , which is a type of dance based on occupational experience of Maggiore Lake community. This search enabled the development of personality and the sphere of life that distinguishes man from animal. This fact, contributing to support the concept that dance is a natural form of expression of man, leading to Laban Dance Coral Bewegung-schore which is a choreography made for large groups 30-500 people of non-dancers.

Laban was looking for a dance that did not use traditional forms of mime and ballet, seeking to de ne a method for training different from traditional European dancers. For this he formulated his

philosophy based on studies of spatial patterns and harmony, creating a discipline called Choreutics.

This is a term adapted from the Greek word for use in logic or scienti c circles. Choreutics is the study of various forms of harmonic motion. Laban structured this research as nding a syntax or grammar of movement, which deals with spatial patterns through lines and shapes described by the movement in Kinesphere. As the semantic content across the emotional and mental harmony of this space.

The First World War interrupted his work and he moved to Zurich where he lived from 1915 to 1918. After the war he was invited by the 'National Theatre , in Mannheim to direct his ballet company and stage their choreography. In 1912 in Hamburg, he produced 'Swinging Cathedral , which was his rst major success with the audience and the press.

In 1923 he founded dance schools in Basle, Stuttgart, Hamburg, Prague, Budapest, Zagreb, Rome, Vienna and Paris, in which each one was run by a master trained by Laban and had his Coral Dance with the local community. His curriculum intended to rediscover the dance as a form of education and therapeutic treatment being based on the aesthetic experience of some teachers, doctors and participating industrial workers of coral dances. These schools gradually attracted modern dancers from all over Europe, as Kurt Jooss and Mary Wigman, its two most eminent disciples.

His choreographies were designed for both large groups and for small companies, both lay and professional dancers.

In 1926, the Laban's Choreographic Institute moved from Wurzburg to Berlin. During this period he held discussions about educational and artistic matters, and raised the issue of copyright for choreographers. Earlier this year he published Des Kindes Gymnastik und Tanz Gymnas tics and Dance for Children and Gimnas tik und Tanz fr Erwachsene Gymnastics and Dance for Adults .

He visited America and Mexico, lecturing in New York, Chicago and Los Angeles. At the end of 1927, Laban published his book Schrifttanz or Kinetographie Laban to enable the accurate reconstruction of dance through writing. In 1929, Laban ran a great event for the Crafts and Guilds in Vienna, which featured 10,000 performers of whom 2,500 were professional dancers. In the same year he directed a Coral Dance for 500 people at the Mannheim Festival.

These two events gave him the opportunity to study the movements of industrial workers, raising his interest in knowing their psychological attitudes to improve their labor movements.

Yet in 1929 he transferred his Choreographic Institute from Berlin to the Volkwangschule in Essen, a high-level training center for dance, drama and music. This school had been directed by Kurt Jooss. Sigurd Leeder was the teacher, bringing together all the criteria to become a Laban Central School .

In 1930 Laban moved to Berlin to direct Allied State Theatres for four years. The last year of Laban's work in Germany was in 1936, when he directed the dance productions for the Berlin Olympics.

These included a Coral Dance for 1,000 people, who were instructed in Labanotation , forming 60 different Choral Groups coming from 30 European cities. In rehearsal, 200,000 guests were present and among them representatives of the Nazi government. These representatives did not approve the work and prohibited its public presentation, claiming some nationalist and universal content, against the government.

Laban was exiled in Stafellberg. Later he immigrated to Paris. He fell ill and could only lecture at the Sorbonne and the International Congress on Aesthetics .

In 1934/35, Lisa Ullmann and Kurt Jooss went to England. His work had been very well accepted there, focusing on the body's approach as an instrument of expression. The physical training was

based on the principles of tension, relaxation, swing, impact and impulse; and included composition lessons of dance and movement observation.

Shortly before the Second World War, Laban and Lisa moved to London. In July 1940 Laban gave his rst course for teachers, called Modern Dance Holiday Course , which was repeated until 1961 in various places like Moreton Hall School, Chichester Training College, Dartington Hall, Ashridge and Chelsea College of Physical Education. When London was severely bombed Laban and Lisa moved to North Wales.

In 1942 the Modern Educational Dance started, emphasizing the eld to which this dance was intended. In the same year an investigation of the movement in the industrial process was launched, by businessman F. C. Lawrence. It was aimed at training women for tasks previously performed by men. Due to lack of lm to record movement, the Labanotation form of registration was used. From this research the book Effort was written and published in 1947. In 1946, Lisa Ullmann opened Art of Movement Studio in Manchester. This became the Educational Dance Centre in England. The curriculum was based on Laban's patterns and spatial harmonies and theories of expressive movement.

In 1948, Laban published Modern Educational Dance , his most famous book.
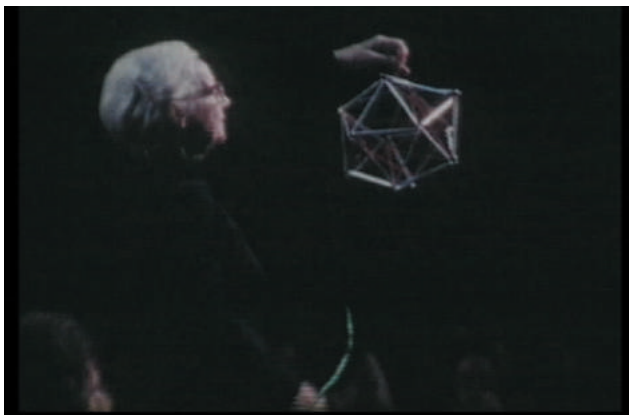
Lisa Ullmann teaching in the workshop in Brazil, 1978

In 1953, Laban and the Art of Movement Studio moved to Surrey. In an attempt to perpetuate his theory, Laban founded the Laban Art of Movement Centre 1954 and published Principles of Dance Movement Notation . Laban died on July 1st, 1958. Eight years later, Lisa Ullmann published Choreutics considered the main work of Laban, containing the author's views on the harmony of space , on the analysis and synthesis of physical movement in choreography, and also a study of the functional, educational and artistic movements.

Within the movement studies, Laban broadened the scope of the study of human movement, as was based on the Universal Basic Principles of Human Movement and not only in speci c dance styles. He proposed a structural approach of the movement, which was used by many choreographers. The Laban method frequently used improvisation in class and choreography.

Laban is also used in psychology. From his observations of the qualities of movement that don'tfocus on what is done but on how it is done it is possible to extract elements for the study of personality. This analysis of personality structure through movement was drafted by Marion North 1975 and presented in her book Personality Assessment Through Movement . Laban studies were also pursued by other therapists and there is an extensive bibliography on the subject.

His work is of great importance in the history of dance, We cannot overlook the context of modern dance and the in uence of the theoretical writings of Rudolf Laban and Mary Wigman, pioneers of German expressionist dance.

In Brazil, this method was introduced by Maria Duschenes, who wisely led her students to nd their own expression. This ability is revealed in the concept of dance: The movement is fundamental to life. When movement happens, it involves the personality of the being as a whole, leads to a state of mind that

brings well-being and joy. At this time, conscious and unconscious levels are in perfect harmony and interacting. Experiences like this aim to stimulate and develop personal sense of self, knowledge and acceptance of others, producing skilled and creative people.   Maria Duschenes, 1989 .

Improvisation by Maria Duschenes date 60s

THEORETICAL APPROACH

To Laban, the meaning of movement is very broad, for humans expand their life through movement. In his book Choreutics he says, we live in a world of movement: the whole universe is in constant motion.

All things are in a constant state of evolution and growth. Tidal   ows in the water and a dynamic air mass will produce wind. Therefore, movement is happening. Movement is the living architecture in the sense of it changing places and changing relationships.

For man, this architecture created by the movements of our body is made of paths in space. Movement is a universal human trait. The experience of movement begins even before birth. Studying human movement is to study the individual, since the movement is the media for all human activities.

In this study, the whole movement is described and understood through its four component

factors strength/weight, time, space and fluency and relates the reciprocal influences between the bodily actions and the mental and emotional processes.

The elements are like the letters or the sounds of written and spoken language. Isolated, elements as well as the lyrics, have little meaning. Their combination is what becomes signi cant because all factors occur simultaneously in writing body movement.

So the body weight or any part thereof, is suspended and carried in a direction of space. This process occurs in a particular length of time, depending on speed; and it is regulated by the   ow of movement.

Thus, the motion is a combination of strength, time, space which are the components of the motion factors. Each factor varies quantitatively between their polar opposites; according to the following explanation:

WEIGHT/FORCE FACTOR

The primitive concept of force is a push or pull exerted by our muscles. This action has the function overcome the force of gravity that draws everything toward the center of Earth. So we can move on without being swept away by the force of gravity we have to overcome it. For this we use other force in our movement, contrary to the force of gravity.

When there is rest, these two forces are balanced.

Strong/Heavy: when we use muscle strength, we create an active attitude, which results in strong movement. When we yield to the force of gravity, we created a passive attitude resulting in falling motion or a heavy motion. The strong or heavy movements tend to act in the same direction: down, both of which, both the active movement strong and passive heavy , have different degrees.

Mild/Weak: The compensation of movements, strong or heavy, is given the use of their opposite qualities: weak and light, they tend to act up in the opposite direction of the force of gravity.

Strong or heavy, is given the use of their opposite qualities: weak and light, they tend to act up in the opposite direction of the force of gravity.

Balance of Forces: the binomial strength/weight expresses the attitude active/passive, i.e.,force is active attitude and weight is passive. To compensate for the strong movement - active - we use the slight movement - passive -; and secondly, to offset the heavy movement - passive - we use the weak movement - active -.

Regarding the force of gravity: the proper use of power/weight factor save energy of movement because it balances activity, passivity and the degree of force.

Graphic representation: If we represent the sphere of action of the human body through a cube, we have the factor power/weight corresponding to dimension of height. This is justi ed physiologically since the pelvis is the center of gravity and facilitates strong moves downwards. On the other hand,

the sternum is the lightness center and facilitates the soft and delicate movements upwards. I note that in everyday use for choreography or classes,the term strong can be replaced with rm , and the term weak can be replaced by light , delicate , smooth and soft .

The movement of the body corresponding to the height dimension on the Dimensional Scale is represented in Labanotation symbols below:
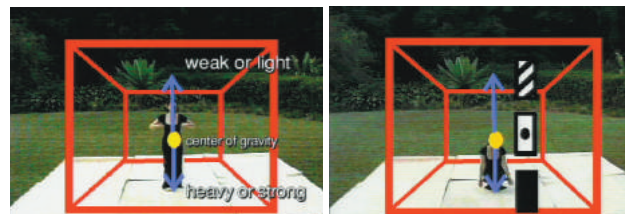
TIME FACTOR

Our mind does not contain time and space -it contains a sense of time and space. Time is de ned as the duration of movement. This is perceived within a limit range of time: if it is too slow, it is not perceived as a movement; if it is too fast it isn't seen. The fast and slow motion are the speed, which in time generate the pace. These are the two basic characteristics of time in movement. The speed is relative, i.e., after a very slow movement, anyother move seems fast. Thus the meaning of

speed is a major power with little resistancefrom the medium; and slowness is very little power with much resistance from the medium.

Rhythm is motion or noise that is repeated in regular intervals, with strong and weak accents. The rhythm of the waves, of breathing, of a pendulum swinging, of a horse galloping,exemplify the concept. The universe is rhythmic in its essence.

In the macrocosm we nd different rhythms: the orbit of the planets, the expansion and contraction of the heavenly bodies, the yearly seasons, the phases of the moon, day and night, the tides, etc. All life on Earth is governed by these rhythms and adapt to them, through periodic variations. So are migratory cycles of birds, periods of mating, periods of owering and fruiting of plants. The rhythms can be perceived in different ways: through sight when looking at a sculpture; through hearing when listening to a song, and through touch when feeling the vibration of sound as do the impaired of hearing, where the attitude towards the time factor is individual. The rhythmic accents can be the beginning, middle or end of an action or movement phrase. Laban gave these accents a meaning: the accent at the beginning corresponds to an impulsive attitude; the accent in the middle corresponds to a harmonious attitude and accent at the end corresponds to a decisive attitude.

As humans are part of nature, they too, live in sync with these rhythms of heart beats during the menstrual cycle, the function cycle of vital organs, and even within the cells. These bodily rhythms are called internal and biological rhythms.

The meaning of the body rhythm is the adjustmentto the different situations of life; successions of movements that, though they aren't executed on a regular basis, they are continuous and homogeneous, that vary from person to person.

The physiological rhythm is how the body deals with time in the transitions of movement. The messages it conveys comes through noise or gestures and pause. Time is more truthful than words or gestures. Awareness of personal behavior related to time, can ease the individual's adaptation to the external rhythm by performing ef cient movements saving some effort. This is the case of successful learning processes in literacy, dance, etc.

Graphic representation: If we represent the sphere of the body's action in space through a cube, we have the time factor corresponding to the dimension of depth. In the human expression of Choreutics, Laban associated positions back with fast and front with slow. He related afast and sudden movement the inward contraction of the body, which displaces the body back quickly; the opposite movement forward, is slow.

On a Dimensional Scale, this factor is represented by forward and backward movement sand their Labanotation representation follow:
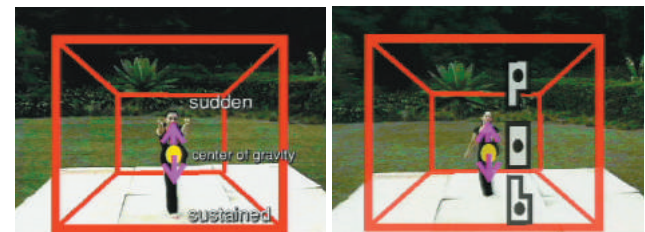
SPACE FACTOR

The idea of space is abstract. It is de ned as the place where we exist. We always occupy space and are surrounded by space when we are static or moving. The move is the displacement of the occupation of our body in space. So The movement is the visible aspect of space. Space is the hidden feature of the movement. In our culture, spatial changes are a fundamental part of human communication.

Their study includes several elements: amplitudes, degrees of extension, levels of space, spatial sensations, action zones and spatial attitudes.

To Laban, space amplitudes are the internal, personal, general and social space.

The internal space is within the body, where the boundary is the skin. Awareness of the internal space and its three-dimensional open channels for the free ow of vital energy, results in a harmonious performance of our movements. Besides the motion of bodies in space there are motion of bodies in space... .

Kinesphere or personal space is the space around us which can be achieved through our body extension without leaving our point of support, which is our place. If an individual moves, changing the spatial position of his support, he carries his Kinesphere to another place. So our movement will never go out of the Kinesphere, and we always carry it with us like an aura.

The size of this aura, i.e., a Kinesphere is the region of space that can be reached with the tips of the body without changing the point of support, at any instant of the movement. This means that certain combinations of movement of the body parts allow to reach a 360 degree range sphere in any direction with any part of the body. The variation of these combinations depends on cultural, age or sexual anatomical factors.

General space is the environment in which we move. It may range from a small scale for example, a room to a universal scale entire planetary system .

Social Space is the spatial relationship in group movement, i.e., the relationship between our Kinespheres. Countless directions radiating from center of our body spreading across our Kinesphere and going to the in nite space.

Degrees of Extension: the experience of movement of each person happens from the moment of conception. Initially the mother's womb is a large space; but, by birth, it becomes a small space for the baby. In the last month of pregnancy, the movements of the baby have a lower degree of extension. This illustrates the different amplitudes of our Kinesphere. In Labanotation it is represented by the symbol X for restricted spaces and И for the ample space.

Levels are another way to experiencing space. When we lie, roll, slide and pull ourselves on a surface, and then get on all four to crawl, we are at the low level, -when crawled in various ways, we sat down and got to our feet to walk are in middle level   and as we tiptoe or jump we are at the top level. This experience of space on three levels, occurs in the   rst two years of life. As the infant develops, the transition from one level to another becomes easier, and the space is experienced in a broader way, making a richer vocabulary of expressive movements. In old age, the use of these levels is restricted due to the dif   culty of mobility. In Labanotation the three levels are represented by the central symbol in this notation.
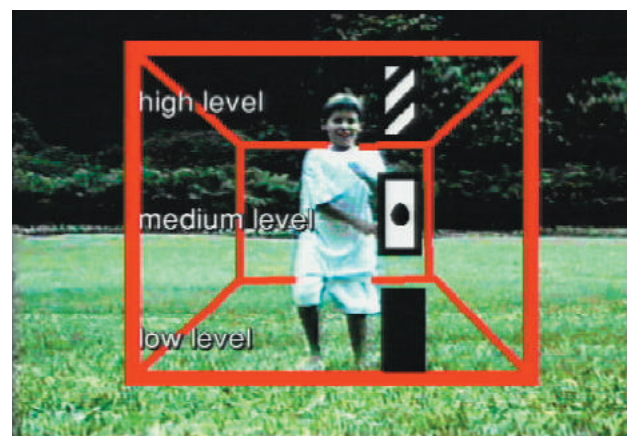
The spatial sensations are to pierce, to separate and to involve. Occupying the three dimensions of space in different ways, we can create movements that emphasize a line in space. The feeling of these movements is to perforate, because the body concentrates its purpose in a line. For example, the downward movement from standing to squatting position emphasizes the vertical line. We can also create movements that happen more in two-dimensional space, emphasizing the plane. The sensation here is to separate or to divide. For example, walking forward divides the space into two sides: right and left, emphasizing the sagittal plane. If we make moves that use the three dimensions evenly, we will create volume. The sensation of these movements is to involve, dig or carve. For example, the movement of embracing another person emphasizes volume.

Action areas: due to the anatomy of the body, each part has its speci c areas of movement within the Kinesphere. Thus, we can also de ne Kinesphere as the sum of the action areas of the body parts. Within its action zone, each body part can describe numerous paths to connect a point in space to another. The proper use of the body's joints allows us to reach any point in the Kinesphere, including the dif cult places to reach, such as the area behind/above by the foot. The human body can be trained to effectively occupy its entire Kinesphere.

There are two space attitudes: the objective attitude that connects two points with a straight line and a non-objective attitude, that creates meanders to connect two points in space. These attitudes have a conditioning factor: the amount of space available. If the space is restricted, the joints will be limited and movement will tend to be direct. If, however, the space is ample, the body can pivot freely, and the movement tends to be exible. Graphical representation of the space factor: in the body's sphere of action, it corresponds to the width dimension. In the human body, exible movement is opened, and the direct movement is crossed or closed. For example, in a move with the right arm, the exible movement is to the right, and the right move is to the left. So, due to symmetry of the body in relation to the vertical line of weight, we have laterality. The space factor is represented separately for the right side and for the left. On a Dimensional Scale this factor is represented by lateral movements with their symbols in Labanotation:
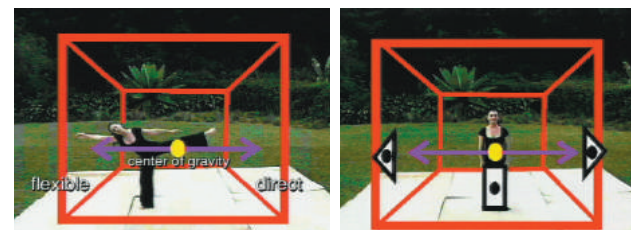
FLUENCY FACTOR

Fluency is the sensation of movement. It happens in two different ways: without inhibiting the spontaneity of movement, or with a controlled drive. Fluency in life is the connection of experiences that occur in different situations we experience since our birth. The oscillation of fluency between freedom and control takes place in succession and within each movement, and we are always going from one extreme to another, to balance the vital energy.

When the flow between its two poles freedom and control is harmonious, effortless movement occurs. This factor is very significant to humans because when movement truly flows, a thinking/feeling unit is formed; and the attention and the decision unite with intuition and feeling.

The two types of fluency are released and controlled. Released fluency occurs when it is difficult to suddenly stop a movement, like being pushed over by a wave on the shore, or in a parachute jumping. Controlled fluency occurs when the motion can easily be stopped at any time, like walking in a dark room.

Important notes:

a released fluency might not be fluent, but it isn't controlled, such as bumping into everything around. On the other hand, a movement can be controlled and flow, such as Tai Chi Chuan.

b released fluency in relation to the force of gravity, is passive, i.e. enjoying gravity's action on movement. Controlled flow is active, i.e., it does not allow the body to give in to its own weight.

c sometimes, released fluency can be cut short by a reflex reaction, which is an emergency outage.

Graphic representation: because fluency is the only factor in movement that is not mathematically measurable nor representable, it cannot be represented neither in Kinesphere nor in Labanotation.

DIMENSIONAL CROSS

The union of the three factors of movement: weight/strength, time and space, gives origin to Dimensional Cross, graphically represented below with its respective representations in Labanotation:
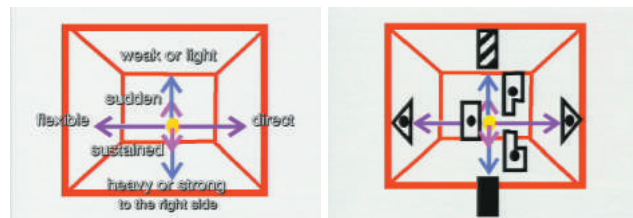
The dimensional cross composes a scale of body movement, that come from the body's center of gravity and go/back in the directions indicated by the Dimensional Cross. The training of the movements of this scale is the basis for the study of orientation in space and of physical experimentation of the qualities of the factors of movement.

ANALYSIS OF THE MOVEMENT

The movement of the study has two combined areas: a mathematical approach and the semantic approach. In mathematical terms, studying the spatial organization of the trajectories that describe the body parts in Kinesphere, consider that the movement is the result of energy release through muscular responses to internal or external stimuli. The move shifts our body or its parts, from a spatial position to another, describing trajectories in space.

The semantical approach comes from the connection between the outer movement and the inner attitude of moves. This is an aspect that covers cultural and social aspects. For example, it is very common for someone to tell the other what is invading their space. This phrase has different meanings depending on the cultural references: what to an American could be close to a Brazilian may be distant, since we are different. There are several motion study systems that cover these two aspects.

In the case of Laban, their system is structured from four components of motion factors and combinations thereof. So when we talk about combination of only two moving factors, we are referring to the incomplete efforts or states of courage, climate or atmosphere. And when the combination is three factors strength/weight, time, space , then we have the Full or Dynamic efforts.

Motion analysis begins with the study of efforts, complete and incomplete, opening a field for un-

derstanding the internal world of human beings, considering that the use of observable movement of factors translate ways of thinking, acting and feeling. In the movement of the study, three motion factors - strength/weight, time and space - are measurable, and the ow is not measurable.

Therefore, the Laban system, movements ow according to two qualities free or controlled between time, space and weight/strength as a unit; that can always be expressed and measured. For this, Laban used Cartesian geometry, as we saw in the case of graphical representation of movement elements.

Mathematical representation of space: it may seem dif cult and indigestible but lightness, elegance, naturalness, inspiration epistemological values are continually af rmed by the creators ofmathematical science, however some people may seem heavy, boring, arti cial, and incomprehensible . The relationship between the Cartesian system and the theory of Laban, starts with the three dimensional space Kinesphere. To study it, Laban used the Cartesian reference system x, y, z as a coordinate system representing the cube. The center of this cube corresponds to the center of gravity of the body when standing: dimension x' is width; dimension y' is height; and, dimension z' is depth.

The front of the body is represented by the parallels between the eye line, the line of the shoulders and the hip line, corresponding to the cube of the frontal plane x, y . Each direction has two meanings e.g. the height directions are up and down .

In the Kinesphere geometric structure, the union of two dimensions originates a plane. Each plane has two diameters, which are the diagonals of the plane or the diagonal inclinations. The union of the points at the ends of the diameters generates an icosahedron, a twenty sided solid. As a cube is a regular solid, it can be inserted into a sphere or a ball. The cube has four diagonals connecting their opposite corners. Each diagonal has two directions

that intersect at the center of the Kinesphere, at the gravity center of the standing body in the middle of the Kinesphere.

So we have three basic types of information to be worked on, within our Kinesphere: dimensions, diameters and diagonals that correspond respectively to the movement of factors, the incomplete efforts and to complete efforts.

Incomplete efforts, Climates and States of Mind: are a combination of two factors de ned, leaving the other two unde ned. These reveal the inner attitudes, interactions and individual moods. Incomplete efforts may deliberately be presented or not. So when they are underlying movements that are not in evidence, called shadow movements. These occur as a preparation and/or complete transition of movements. Twitching one's ngers before grabbing an object exempli es a shadow move.

Incomplete efforts including shadow movement is a non-verbal language, felt unconsciously, even by newborns, as signs outlining our feelings, ideas and intentions. It is manifested very often in our daily movements, but to analyse its contents and its interrelation with behavior, an acquired acuity that comes from training in movement observation, is required. This observation detects kinds of climate coming from the relation that each factor of movement has with an attitude: strength/weight with intent, time with decision, space with attention, and uency with progression.

Laban classi ed these States of Mind according to their combination of pairs of factors of movement. All elements are present in any movement, but the observer can detect which are more evident and de ned.

Geometrically, the relationship of two factors in space occurs in two dimensions, forming planes that retain af nity with the factors of movement corresponding to its dimensions. Therefore, the movements that take place in these planes keep this af nity relation. The name of each plane is close to its image.

Door Plane: its movements have an affinity with the factors weight/strength and space, which correspond respectively to height and width dimensions. The missing factor is time.

Table Plane: its movements have an affinity with the factors of space and time, which correspond respectively to width and depth dimension. The missing factor is strength/weight.

Wheel Plane: its movements have affinity with the factors strength/weight and time, which correspond respectively to the dimensions of height and depth. The missing factor is space.

There is the Diametric scale, the Belfry scale, the Ecuador Scale or the Default Scale connecting points of the diagonals. They are used for training and to increase spatial reasoning. These basic scales are a source of creation for numerous other scales. This base orchestrates Laban method as a creative dance school system and develops the Harmony of Space within the Choreutics.

COMPLETE EFFORTS, DYNAMIC OR BASIC ACTIONS

As the result of the combination of the three factors, the type of movement is defined as weak/strong or light/heavy; fast or sustained; and, flexible or direct. The fluency factor can be set or left open. In daily life, rarely do we complete a basic action, but we go from one incomplete effort to another. The Complete Effort occurs when we need to push or carry a heavy object, express strong emotion, or in an extreme situation such as a serious accident. In these circumstances the body switches to a radical action.

Although there are eight dynamics, each individual generally has more affinity with one or two dynamic. So training and experimentation of dynamic classes increases our vocabulary of movement, enriching its expressiveness and improving the efficiency and accuracy of our actions. Eight Dynamics, Basic Actions or Full efforts are:

flick
weight light
time sudden
space flexible

dab
weight light
time suden
space direct

glide
weight light
time sustained
space direct

float
weight light
time sustained
space flexible

slash
weight strong
time sudden
space flexible

thrust
weight strong
time sudden
space direct

wring
weight strong
time sustained
space flexible

press
weight strong
time sustained
space direct

In practical terms, the Diagonal Cross Scale is a sequence of transitions of opposite dynamic, always through the body's center of gravity: the ﬂoating body center to beat, the center of the body; to slide the body center to slash, the center of the body; ﬂoat of the body center to twist, the center of the body; to shake the body center to push. Like with diagonal movement, they explore instability. On the move, what we call balance is never a complete stability or immobility; but it is the result of two contrasting mobility qualities.

The representation of dynamic in the Kinesphere space are the cube diagonals, for they simultaneously provide information of the three dimensions x, y, and z . Graphically, the diagonals of the cube diagonal correspond to the cubes edges. Each vertex of the cube corresponds to a speciﬁc dynamic: As in a symbol of Labanotation.
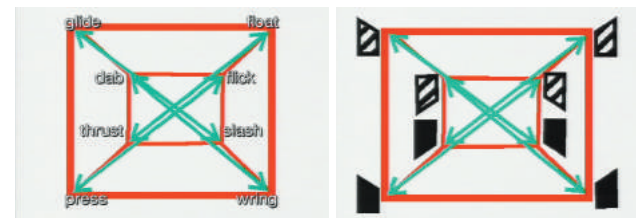
SYNTHESIS
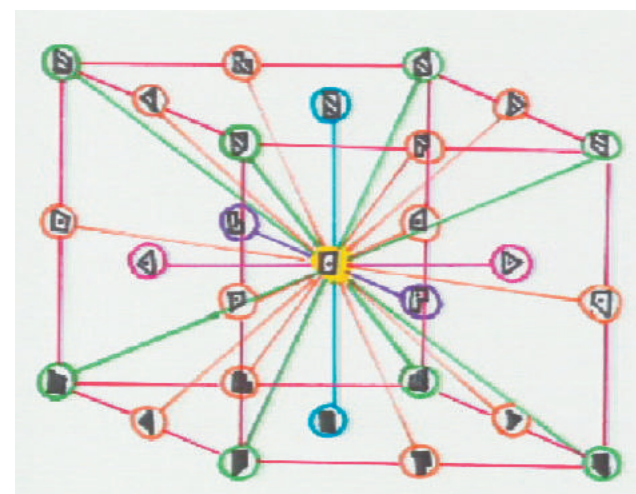
Graphically, the sum of dimensions, diameters and diagonals of the Kinesphere, brings all the cube directions together with their respective symbols in Labanotation, representing the movement of factors and their relationships.

The icosahedron twenty-sided solid is another representation of Kinesphere caused by the connection of the ends of diameters forming plans.

Scales proposes several dynamic sequences, each sequence leads to different transitions or connections between the dynamics. There are sequences which change the dynamic gradually changing a movement time factor. For example, the passage of the dynamic pressure to glide, change the weight factor; from sliding to oating, we change the space factor; oat to ick, we changed the time factor. Thus this sequence pressing/gliding/floating/flicking, observe transitions of a motion at a time factor. For example, the passage of the dynamic pressure to glide, change the weight factor; from gliding to oat, we change the space factor; oat to ick, we changed the time factor.

The practical training is to experience the dynamics in different parts of Kinesphere with different body parts. In general, the hands and the face are more anatomically t to this practice, but we should also try to use other body parts. This training takes place through exercise and pre-set by the teacher or improvisation scales, individual or group based on a theme related to movement of factors.

The importance of this training in varying sequences manifests itself in daily life, as we experience physical sensations that we rarely have the opportunity to. These increases our vocabulary, enabling us to give harmonic uency in connecting our actions. Not always we have the opportunity to express ourselves through all the dynamics, for daily routine leads us to perform repeated movements. Experimenting new sensations is healthy and pleasurable for the individual.

Images of improvisation

PATHS, 1984

Teaching children entails huge responsibility that includes, among various tasks, building a healthy body physically and psychologically. The article below illustrates the body image that accompanied the dances Analivia education in school.

STRAIGHT BACKBONE, UIET HEART

How is your backbone as you read this?

As you scroll through re ections read poetry what Walter Franco wisely put in his song   Everything is a matter of keeping the mind tranquil, spine straight and the quiet heart   take advantage of this moment to listen to your spine a little more.

Seek the fullness of your body

The term spine conveys the misconception of a fixed vertical structure to hold up our body. The spinal cord term means a sequence of moving bones, correct idea in the case of our body. The word straight line means a line connecting two points without curves, wrong idea for our body. The word assumes a line connecting two points with curves, correct idea in the case of our body. Thus, the spine erect is a line of movable bones with natural bone bends connecting two points, the head and hip.

The architecture of our body, the spine is the movable shaft that allows the extremities, that is, hands, feet and head, reach any point within 360° around the body. The mobility of the spine should be preserved to maintain body health and freedom of expression of emotions. Express emotions, twisting its power, bending it, stretch it in any direction, at any time if you want, without having to say that I cannot, or I do not move that piece my body. The spinal cord should be able to move in any direction and at the same time, be able to rest upright, quiet, respecting its curvatures and preserving joint spaces between the vertebrae.

For this one must sit on our sitting bones when sitting, and when standing, stand on the femoral lame joints that transmit the weight down the bones of the legs to the ankles, and expand heels and the toes bend, without unnecessary muscle tension.

At any age, one can amplify the movement of the whole body of the column. Just use the proper technique taught by qualified teachers. Respect your body: never use violence or force it. There is a body intelligence that must be heard, used and perfected. Any violence decreases movements and makes inappropriate use of our body architecture.

Be kind to your body, kind to your spine and feel emotional peace. Work your body always, every day, every hour. Be happy and seek the fullness of your body.

TRACE-FORMS, 1984

Trace-forms: a children's choreography with 10 year old children who explore the video and the movement trajectory of expression holding flash-lights in the dark.

A teacher is not one who always teaches, but someone who suddenly learns . Rosa, Guimarães; Grande Sertão Veredas; p. 235 Dance made by children under direction of Analivia.

To watch the video, access

https://www.youtube.com/watch?v=W3u2tsIovuM
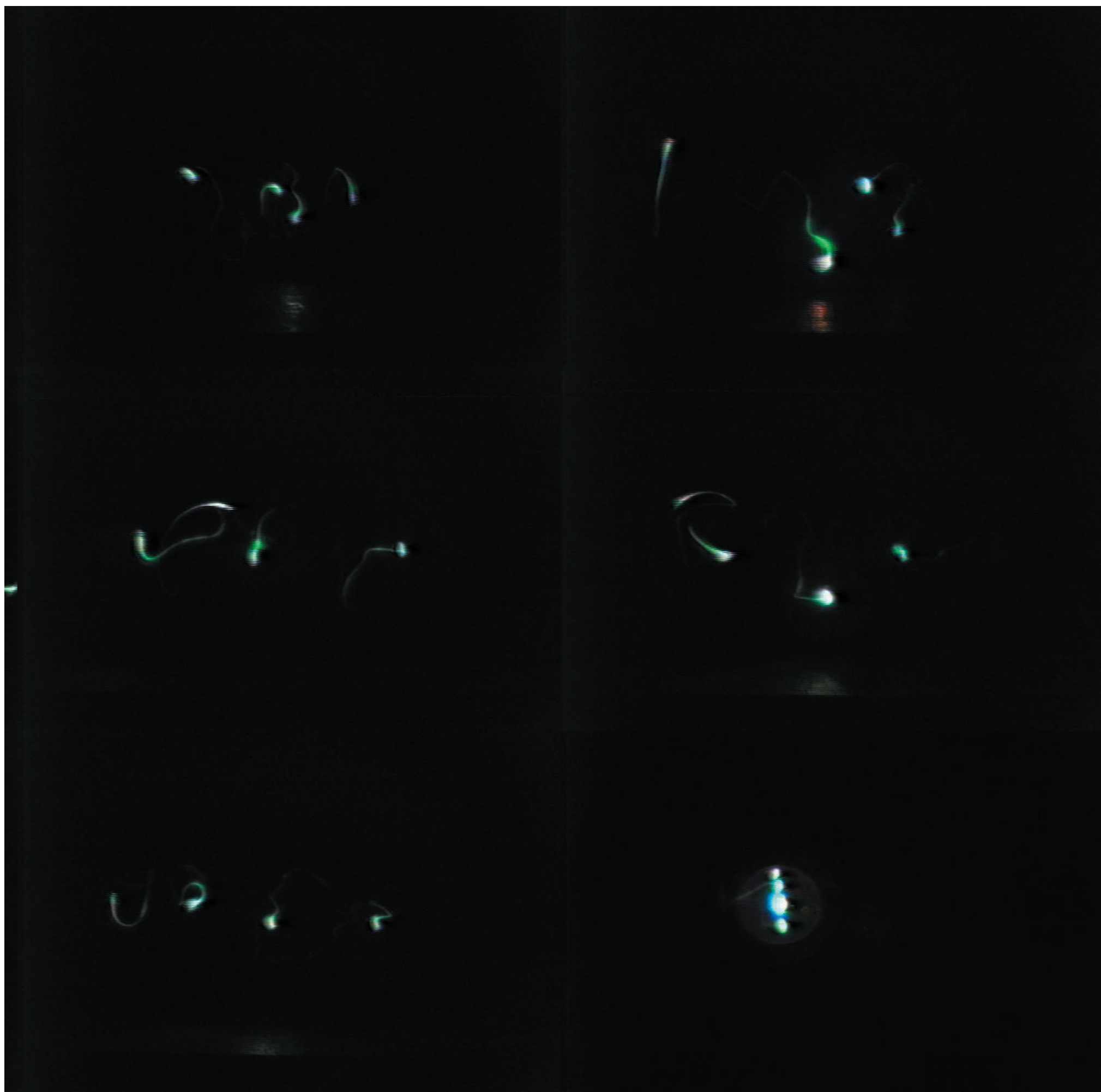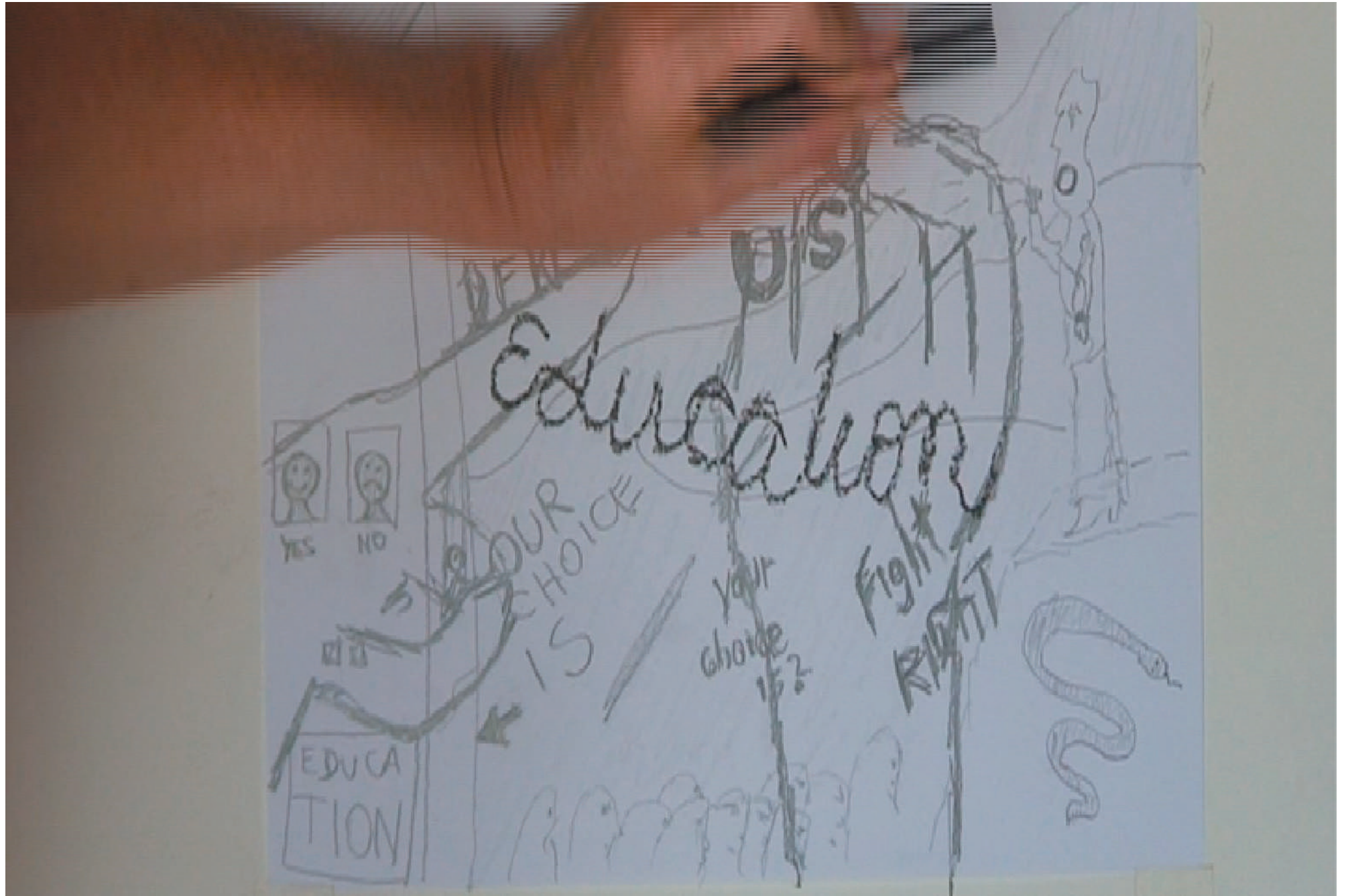
CHILDREN, 2005

Videos co-authored with 5 to 12 year old. The part-nership includes all stages: the subject, the script, the preparation of material, video recording and editing.

To view the videos, visit:

https://www.youtube.com/watch?v=N33sJ5KYV9k
https://www.youtube.com/watch?v=19ucOYQin8E
https://www.youtube.com/watch?v=0J92WqHGrLs
https://www.youtube.com/watch?v=e9xlBmwDHwU
https://www.youtube.com/watch?v=DErAHldoxGI
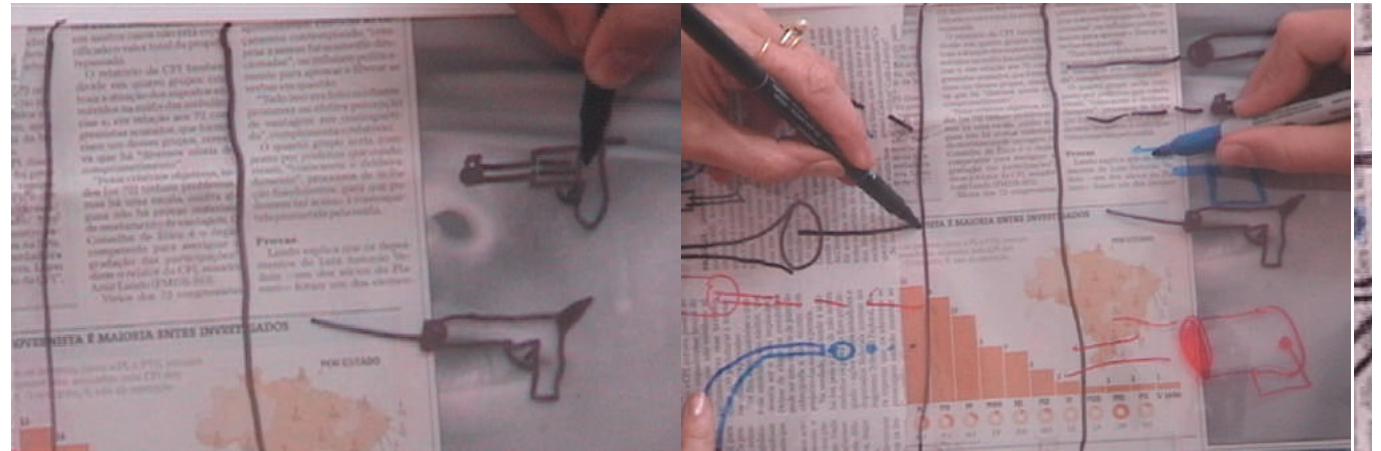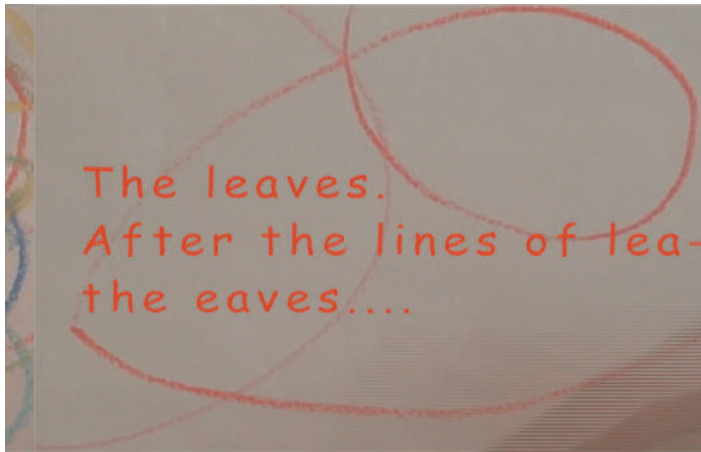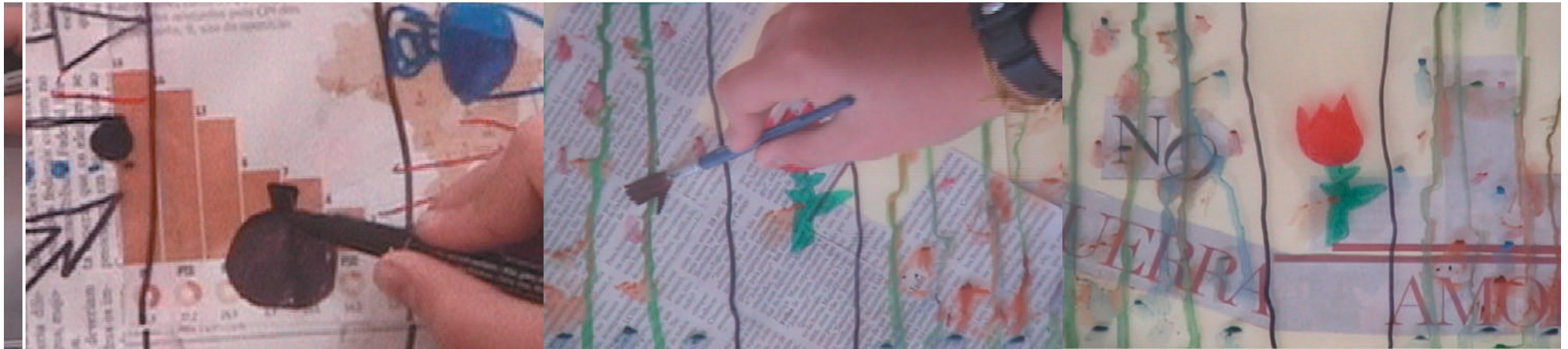
The leaves.
After the lines of lea-
the eaves....

Listótchki.
Póslie strótchec lis-
tótchki.
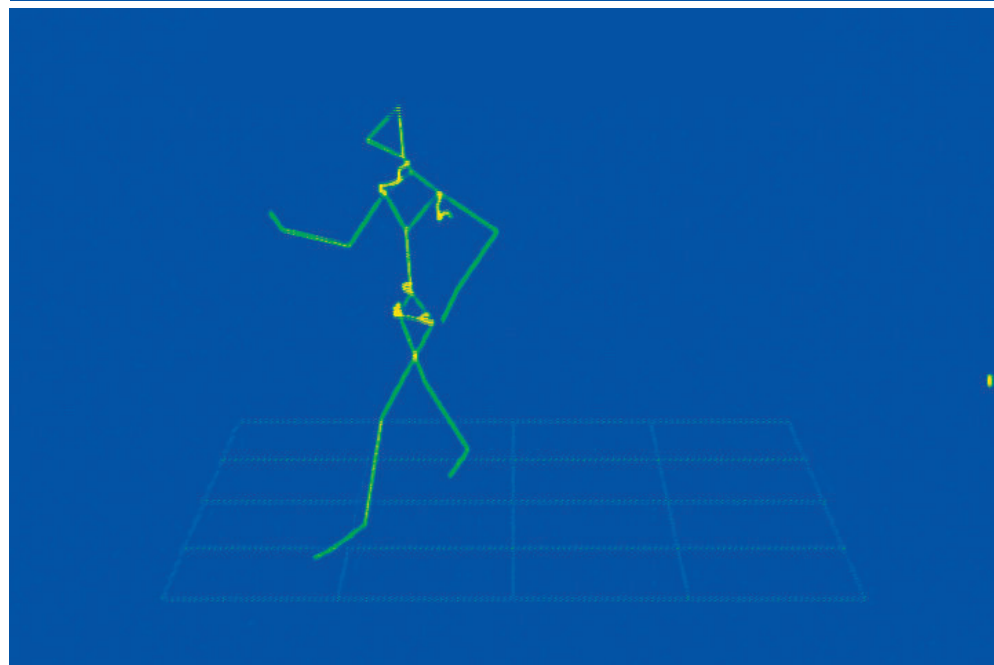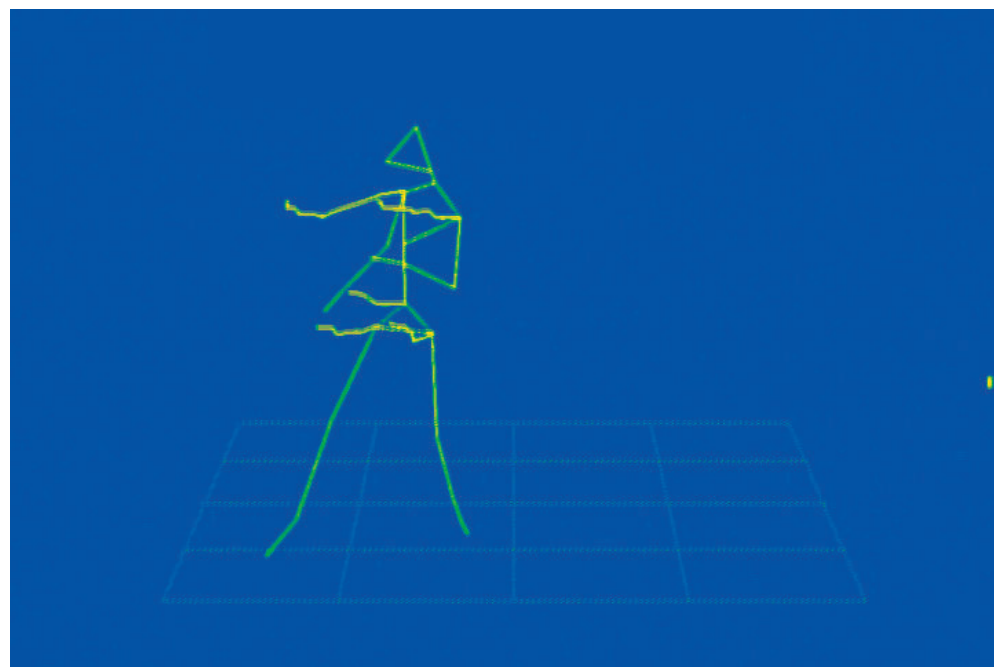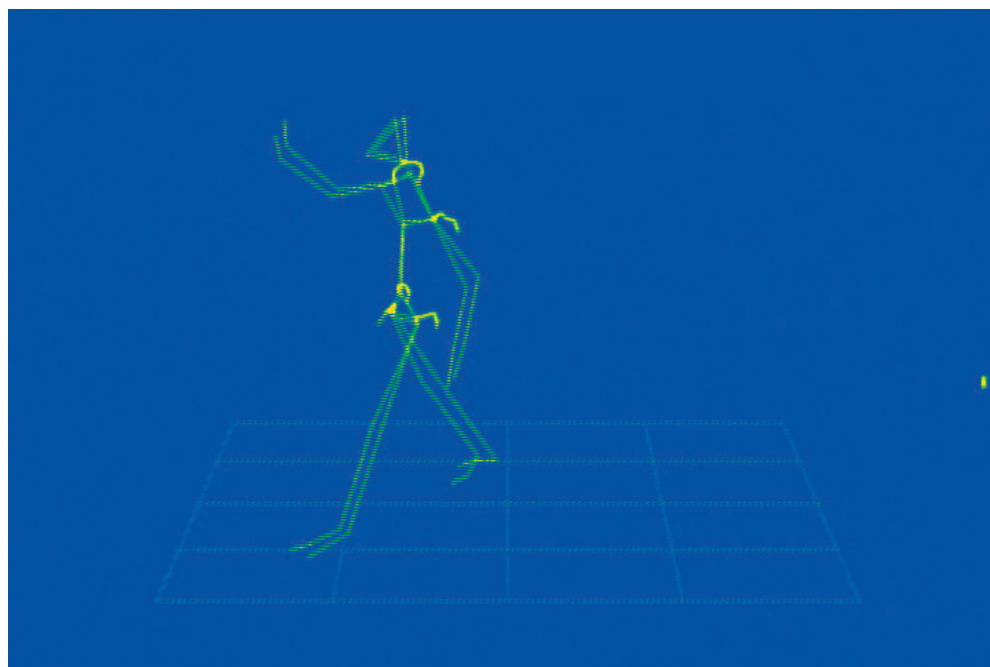
DUCORPO, 2004

Classes of bodywork online. The content ranges from the physical preparation to movement therapy, the reading of complex sequences of movement and setting compositions. The goal is the democratization of body movement education reaching people who could never pay for a high-level classes, which are taught in academies and specialized schools. There are 77 classes in three languages: Portuguese, English and Spanish.

The theoretical elaboration that enabled this work was the Analivia doctoral thesis, under the supervision of Arlindo Machado, called Looking for the Cyber-Harmony: a dialogue between body awareness and electronic media, in 2004. This thesis originated duCorpo which was posted on the Internet and till now had more than 350.000 hits.

To watch the video, access

https://www.youtube.com/watch?v=zTNSh01TmBQ

ANALIVIA CORDEIRO
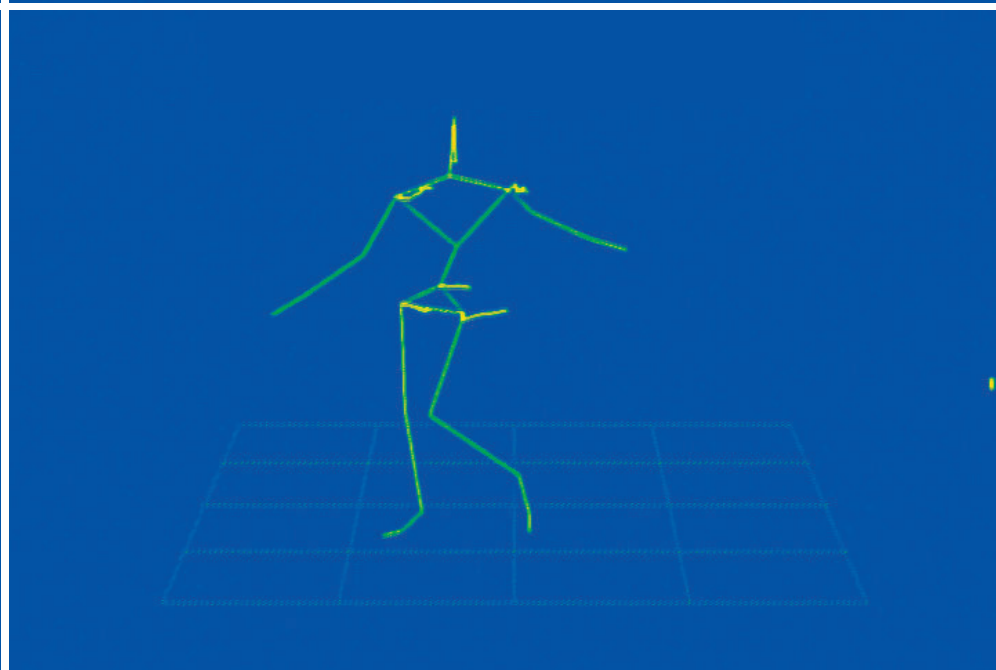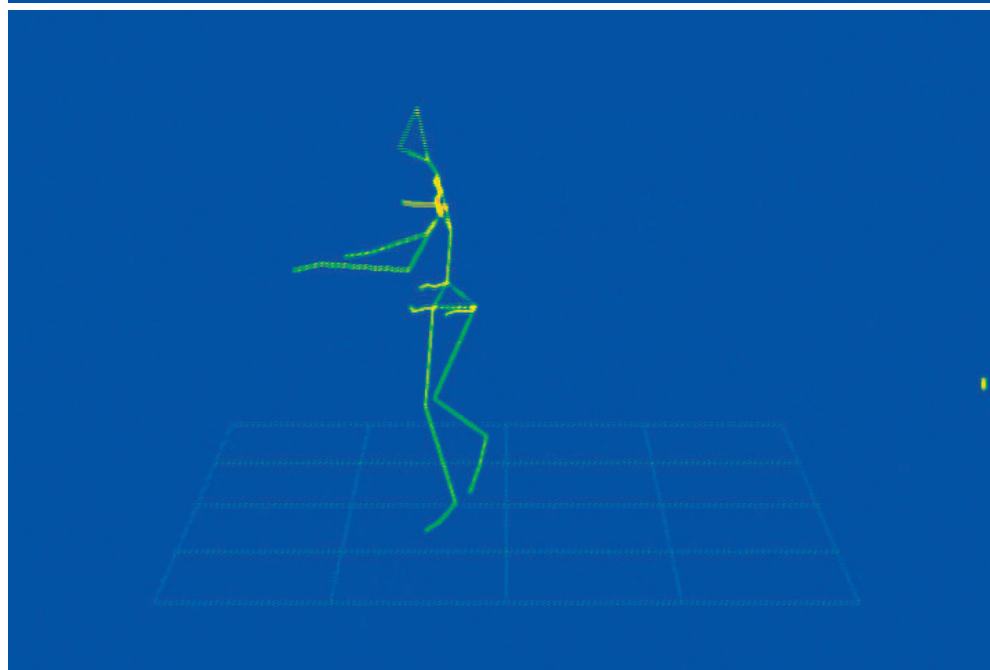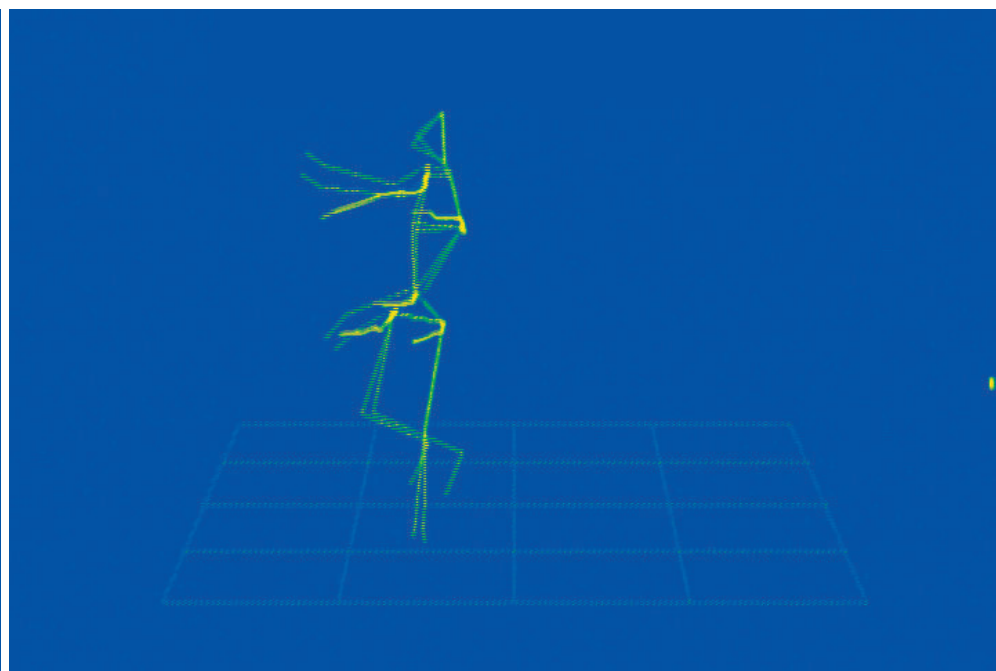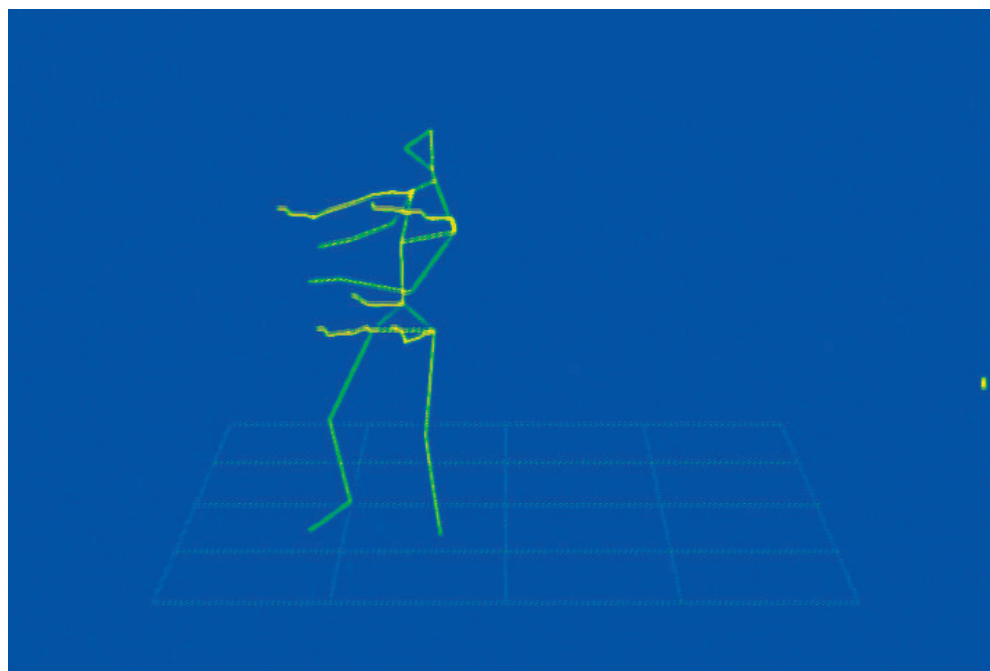
A SUMMARY

A summary of the thesis Looking for Cyber-Harmony: A Dialogue Between the Body Awareness and Electronic Media advisor Prof. Dr. Arlindo Machado, 2004. To take in the content of this thesis one is required to read the text in addition to body practice tailored for anyone.

Situating this work, I observe that millions of people are affected daily by the continuous use of electronic instruments impregnating human relations, and a re ection on the in uence of their use on people's behavior is necessary. These instruments dictate physical and emotional behaviors that shape and stress the bodily functions when turned into daily habits. They may cause injury, suffering and pain carpal tunnel syndrome, for example . In other words, if we consider the body as a bone structure, covered with skin, containing various types of fabrics; we can say that the characteristics of the structures and tissues change with daily use and abuse. Thus, the tissues naturally resisting mechanical stress to stretch, bend, twist, rip, compress; can de nitely have structure and functioning compromised if they are in constant demand for repetitive moves.

Within this panorama, this study aims to contribute to the personal balance in terms of body movement. Currently, there are numerous suggestions in this sphere   from medical treatments to religious rituals   but there are no proposals for appropriate action to the user body of new tech-

nologies in their own sphere of action. It is here where duCorpo can help, using electronic means for the solution of the problems caused by itself.

duCorpo proposed body procedures integrated with electronic language, inclined to allow a full body experience, including physical, mental, sensory and emotional creative and engaging character. Don't try to nd the rationale behind this, for it belongs to body practice, not exclusive to the rational eld.

INTRODUCTION

Among many aspects that shape the culture of the new technology, I note that one of them still following the earlier tradition: the kind of body relationship between man and machine, i.e., currently de ned as the user relationship with the devices of new technology. In this relationship, the value of the individual as unique and individual has never been considered essential for productive work. During most of human history, the inventors were dedicated to construction machinery and instruments aimed only to increase the performance of the human body in the intervention actions in nature and society. These instruments and machines mercilessly dictated physical behaviors and destroy emotional bonds, shaping your body, the hard way, throughout your life. The behavior over use of electronic devices has become routine and most people

are not aware of the problems the over use can cause. Injuries, pain and even death can be cause by abnormal use of equipment.

In other words, the changes in the day-to-day, we are usually using the hands or focusing your eyes on some activity. And such everyday activities tend to be repeated for long periods. Constant repetition implies destabilizing body efforts that the very body seeks balance with other parts of the body not directly involved in the action. These repetitive efforts, which are predominantly made automatically, often cause damages of various types and degrees of intensity for the body.

Seeking to understand this situation more scienti cally, in this thesis, the body is treated as a bone structure, covered layers by different types of tissues, the outer layer being skin, which changes its functional and emotional characteristics, according to its daily use and other factors; and its changes are seen as a functional and expressive shift of this body architecture.

This way we can reframe the thought of two paragraphs above more precisely: despite the body's tissues natural ability to withstand mechanical stresses such as stretching, bending, twisting, ripping, and compression the way its structure is used can profoundly change the ability of these tissues if they are constantly overused, in repetitive and stressful positions.

But it is only when excessive use of the body is characterized as a problem that most people become aware of how misused their body is. In general dystonia is so incorporated into the body that people are not aware that they exist. If the dystonia caused decreased joint movement, this loss of movement is not perceived as a limitation, it is perceived as that's how it should be, because there is no longer the memory of how full movement use to be. ueiroz, 2001: 23 . Or, it is believed that the daily hassle, which can even cause

pain or discomfort in the body, can go away or be dissolved with bed rest. This does not happen. The pain may ease, but the repetition of movements or the continuation of emotional pressure can turn it into chronic tension.

Situational awareness above belongs to the sphere of body studies researching the body's state of the relationship as a whole, with the joint health and behavior of the muscles. One of the current revelations of this study area says that every feeling, every thought, every emotion has an immediate muscular response. So during mental stress situations there is muscular stress, even if the person is not aware of it. A correct statement is that the mental fatigue, changes the attention span and many details may be lost. Under emotional fatigue, there is a loss of momentum in the responses of the body and a distinct change in tone of the muscles of the body that can either contribute to states of depression or to excessive excitability. Todd, 1975: 263 . As noted by Shapiro 2001: 383 regarding the current situation of the company: Sometimes the root of a problem is not a speci c traumatic event, but the accumulation of stressful situations. This usually happens in large urban centers, and leads to physical illness, problems of memory or interruption of social performance. With regard to body movements, the philosopher Bachelard 1994: 91 , forging an ideal situation, says, How psychology would deepen if we could know the psychology of each muscle What about the animal being there in man But our research does not go that far.

Considering the situation above, a key issue is raised: do the current technological tools respect delicate sense organs, physiological, anatomical and neurological structure of the body, and the unique story of each limb? I don't think so.

On the other hand, with the advancement of technology itself, it can be said that the history of

man provided us with enough knowledge so that we can honestly analyze the needs and test the effects of any new instrument from many angles before it is put into action.

In this view we can say that the current researchers should begin to sincerely consider, the consequences of their new inventions, focusing on respect to the proper biological functioning of the human body in detriment of short term technological and commercial success, could help care for our body as a primary machine. Businessmen could approach technology use with a comprehensive sense of human wellbeing and safety rst so we can work or have fun with the new tools created by them. We could be truly respected as complex individuals. In this way, we might be able to create a day-to-day with more favorable habits for ourselves.

GOALS

The practical objectives of duCorpo among others is to balance the day-to-day user with the integration of two types of activity: interaction with technology and introspectivet procedures, which could enable a more integrated detection of the world, or, at least richer in mental, sensory and emotional experiences. I believe that the new generation, that knows, even if super cially, meditation practices or Eastern philosophy and on the other hand, lives so closely to video games, computers, virtual reality, etc. would have no dif culty in adopting these two practices, providing that they are guided properly. In addition, N-Geners also has a keen interest in body image and in health. Tapscott, 1998: 204 . Therefore, this approach may prove to integrate a new universal cultural form, as another step forward in the history of human affection and self-awareness.

This approach is being adopted in other areas of new technology: What was recently considered an inconsistency in the field of design programming can already be seen as a necessary and welcome bold move. This is mostly for the fact that subjective elements are being incorporated into the product development and technology and not just in functionality or technical predictability of systems. This is less like war strategies and perhaps more as consumer strategies, yet combined. The individual has never been such a valuable target. Mello, 2002 .

Another goal is to go to children, pre-teens and teenagers for answers. To justify, I sought testimonies like that of a 16 year old teenager, Lauren Verity, extracted from the book Tapscott 1998: 292 I think the Net is probably changing the nature of childhood because it opens up the world to everyone. We can get any information, in any area, even those which previously didn't interest us. Now we're getting interested even in these areas Tapscott, 1998: 292 . Or that of Thomas C. Guedes, a boy of 11, when his mother banned him from playing on the computer Mom, you got me everything I have in life. Or that of Patricia, fashion student, commenting on her personal experience. I need a password to get into another moment of my life . These testimonies, among many others, reveal the critical role of technology in the lives of young people.

From a theoretical point of view, an obvious serious problem in these young people's lives is the lack of movement and exercise. They spend hours playing, researching, dating or working in front of a monitor where the eyes follow movements of objects doll, car, or information, etc. on the screen and ngers move buttons triggering this virtual world. The rest of the body is most likely slumped.

For all age groups, we found that virtual culture or information, takes away physical mobility. The urban environment, added to the apparatuses of new technology constantly stimulates vision in detriment of physical mobility and other senses of

the body. The consequences of this trend negatively affects adolescents by depriving them of fully moving their body, and commits their development at all levels of existence.

duCorpo is a body practice with an educational character, among others qualities, developing a constructive role. Another objective is leisure, opening the possibility of a purely recreational activity, free and light with an electronic apparatus; letting go, of a stubborn attitude of conquest to be open for pleasure and internal self-confidence, letting go, letting our desires needs and curiosities flow, regardless of physical and mental obligations imposed. The stubborn attitude of conquest and/or violence characterized the contents of most of the products of new technology, both professional and popular consumption, either for work or for fun, is a fundamental tonic in social attitude of most consumers of these products, for any age group.

Another objective of duCorpo is to mainstream the most advanced modifications of body techniques that are still restricted to an affluent audience.

The tradition of physically shaping the body goes back centuries. Noverre, one of the choreographers of the XVI century, said: to dance in style, walk with grace and present themselves nobly the order of things should be completely reversed, through hard work, to conform to a completely new situation introduced to them earlier Miller, 1998: 312 .

In the twenty-first century, this trend is being accentuated. The exaggerated importance given to the appearance of the body is the focus of attention and investment, both by the media and economic power. In large cities, there is the dualism between a lifestyle habits trampled on by often inadequate sedentary lifestyle, stress, smoking, poor diet, etc. , coupled with technological innovations which cause greater physical inactivity , and the need to build an acceptable body,

which can be displayed, even if the basic artificial practices, such as prostheses implants, consuming hormones, and extreme exercising as lifting heavy weights.

This unbalanced body work is part of a complete picture. Nuno Cobra, a conscientious and well prepared personal trainer, says: Due to our more and more artificial lifestyle, break all the natural laws of basic health care nourishment, motion, sleep and relaxation one by one. But the body is resistant; sometimes it takes 20 or 30 years for these negative habits to provoke a disease. Cobra; 2002: 12 . Regular physical exercise promotes elasticity and tones the muscles throughout the body. There are many modalities of exercise, but most important is that practiced on regular basis, avoiding excessive efforts the younger the better. Hence, another objective of duCorpo is health.

duCorpo contributes to a physical/emotional body/balanced mind through relaxation practices, elasticity, muscle tone and fun orientated along audio-visual instructions via electronic means.

The preparation of this proposal, complex and profound, is based on the simplicity and the restoration of functional movement, harmonious and universal body. Search a positive and favorable to the human organism the relationship of electronic media with the overall health of the human body, duCorpo proposes corporal practices directed at any person in any culture, gender or age.

TOOLS

To achieve these goals it is necessary to access proven effective theoretical-practical tools. Selected in the eld of body awareness, four techniques from Laban method, the Feldenkrais method, the Eutony and Endobiophilia - and, in the eld of new technology, a movement reading and learning software Nota-Anna.

Endobiophilia

Endobiophilia is a word of Greek origin where Endon = inside, bios = life, philos = friend, thus designates a friendly respect to the inner life, listening to what lives within the body and what it needs to live well.

This technique was created by Odile Vaz-Geringer in Paris. For her, the elasticity of all body tissues skin, muscles, tendons, ligaments, veins, arteries, connective tissue support, the fascia and bones is key to the integrity of the body, for people constantly performing a task as duty, gradually loses their exibility. Another key factor is that people have all the means to reverberate and live. So on that principle, Endobiophilia works on the entire bro-elastic body, muscular, osteo-articular, circulation and lymphatic systems.

As a rule, the higher the capacity of tissue compression, the higher it's elasticity in a proportional ratio. Elastic assumes two opposite and complementary actions: the compression and expansion or relaxation or stretching . Relaxation of the muscles, works from inside out. When the tissue of our body is compressed it reacts with opposite action. Thus, compressing it opens the possibility for dilation. According to Odile, the human being is populated with elasticity. When humans become aware that this is the soul of emotion, they bind their own life Vaz-Geringer, 2001, 109 .

Eutony

The Eutony was created by the German Gerda Alexander in Denmark. She developed her work by watching her students and herself. Personally, after several years of practice, she de ned Eutony Eu = harmony, tony = tonus : through balanced opening of the joints and the exibility of tissues throughout the body, Eutony enables sensitive contact, plea-surable and intimate with your being, resulting in awareness of its own individuality.

Technically speaking, Eutony advocates the resumption of body awareness as a procedure to dissolve dystonia and tonic xing. The body perception can be done by stimulating the super cial and deep sensitivity, through the perception of the skin, bones, internal spaces, the volume of the body and joint movement, i.e., the development of extero and proprioception. This stimulation provides the possibility of conscious control of muscle tone, which can restore muscle balance and tonus and the neuro-vegetative functions in various parts of the body. The tonus is a fundamental concept for Eutony.

In very succinct terms we can say that, according to psycho-physiologists, muscle tone, is the activity of a muscle in apparent rest. Normal consists of discrete continuous tone voltage in the normal muscle, so that the opposed limbs slight resistance to displacement when handled or moved passively. Kandell and Schwartz, 1985 in Russian; 2001: 9 . Muscle tone is of fundamental importance in the maintenance of posture and support; furthermore, when the tone is appropriate it allows the lowest fatigue actions. The explanation for this is slight contraction of the muscle bers do not constrict all at once but in layers allowing less muscle fatigue. An imbalance of tonus is often accompanied by a neurotic disorder Todd, 1975, 31 .

Within this universe, to relax the neuromuscular tone, Eutony returns to the muscles exibility, dissolve the tonic xings providing the body the chance to experience endless variations tonic, i.e., to break them the Eutony releases joint movement.

In uencing muscle tone, acts on the whole body tonus, i.e., the neuro-muscular tone, vegetative tone and the psychological tone. It is important to note that the overall tone, i.e., the set of tone of various body tissues, it is the basis on which all the emotions occur. For example, a person with a tonic

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xing has no ability for emotional or expressive variations and can be considered ill.

Feldenkrais Method

Moshe Feldenkrais 1904-1984   was born in the Russian city of Baranovitz; he migrated to Palestine in 1918 to work in the construction. He also practiced judo martial art.

His method was founded on the notion of self-image formulated by himself: a person tends to consider his self-image as something given by nature, though it is the result of his own experience. The appearance, voice, way of thinking, environment, relationships with time and space - to select examples at random- are aspects, in most cases, are personal and innate characteristics; but in fact, each major element in the individual's relationship with others and with society is usually the result of an extensive workout. Walking, reading, recognizing three dimensions in a photograph are skills that the individual accumulates over several years.

In this way, the person acts in the world according to their self-image, which for Feldenkrais is conditioned by three factors: hereditary, education and self-education. The hereditary factor is one that concerns the physical structure in anatomy terms. The educational factor is related to the cultural and social conditions in which the individual is inserted. The self-education factor is determined by the inner strength of personality, which leads to individuality and promotes different behavior.

For him, self-image is made up of four components: sensation, feeling, thought and movement. The feeling component is formed by the ve senses   hearing, vision, olfaction, taste and touch   plus the kinesthetic sense comprising effort, work, orientation in space, the passage of time and rhythm. In feeling he included, in addition to the family emotions of joy, sorrow, anger, and so on, self-respect, inferiority, the super-sensitivity and other emotions, conscious or unconscious that color our lives. Thinking encompasses all functions of the intellect, such as right and left positions, good and bad, right and wrong; understand, know what we mean, sort things, comply with rules, imagine, know what is perceived and felt, above all, remember. Movement covers the changes of time and space in the state and body con gurations and parts, such as breathing, taste, speech, blood circulation and digestion.

In practice, this method recognizes and uses the interdependence of the four components of the self-image   thought, senses, feelings and movements   a sophisticated and simple system of sensorimotor instructions based on physics, neuroscience, biomechanics and motor development.

Brie y: feeling and thought are linked to the movement, their functions are the basis of the creation of self-image through movement. The trend re ects the overall condition of the cortex of the brain that activate muscles. The nervous system is also the basis of awareness because it provides the stimulation of certain cells of the motor system. Feldenkrais Method offers the individual the revival of its basic movements: rolling over, sitting, crawling, walking, in order to clarify this process experienced spontaneously during development and may provide, in the adult stage, a reorganization of the individual as a whole.

The goal is to improve the ability that is, expanding the boundaries of the possible: make the impossible possible, make easy what is dif cult and make easy pleasurable. Feldenkrais believed that only easy activities are and enjoyable, and will be part of normal life and will be useful at any time. Dif cult to perform actions that take effort to perform and   nd internal opposition, will never be part of everyday life; and with age, people will lose their ability to perform them.

The Laban Method

This method has been explained above.

DUCORPO

Today, we live two-way nature: one ancestrally inherited' planet, and the other, the modern, acquired' industrial and urban environment. One can choose to either deny one in favor of another; the important thing is that these two senses of nature are lived and understood in the integrity of their ontological structure, from the perspective of a universal perceptual awareness embracing the world, making it one, in agreement and harmony of emotion assumed to be the only reality of human language Pierre Restany, Alto Rio Negro in the presence of Sepp-Baendereck and Frans Krajcberg, August 3, 1978, in Cultural Frans Krajcberg, Fundação Cultural de Curitiba, 2003 .

Looking around, I wonder what time is for those who work the body . It is not the same as what it is in science, nor that of the clock. And space? I wonder what space is for those who work the body . It is not limited to the anatomy or physiology. Few people consciously experience space or time with their own bodies in daily life. Most people carry out tasks, lling their schedules on time, day after day. For them, the movement of body practices is transformed exclusively into mechanical gymnastics. duCorpo is open for people to acquire new dimension of knowledge of their body.

In theory, the planning of corporal practices had the following intent:
  promote joy and pleasure;
  avoid interpersonal comparison and competitiveness;
  emphasize individual improvement;
  provide opportunities for self-discovery and decision making;

  encourage acceptance of others;
  stimulate the production of new challenges within everyone's possibilities;
  promote perceptions of autonomy and choice;
  inform scienti c and accurately use.
Participants were also encouraged to:
  choose their favorite activity;
  enhance playfulness;
  value the process seek gradual improvement in personal performance and not the end product results, interpersonal comparisons ;
  compromise and challenge in reason.
  In short, I will move my body a little bit differently every day to feel my spirit warming, nurturing my feelings and my ideas. I will make my days more signi cant, more uid, enjoying every minute leaving the weight behind. Every day, week, month and every year, register on a daily basis each feeling and idea, so they don't pass without meaning.

Thank you for your attention,

Analívia Cordeiro

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Para usar dentro do corpo.

Para uso um

Gente

vive
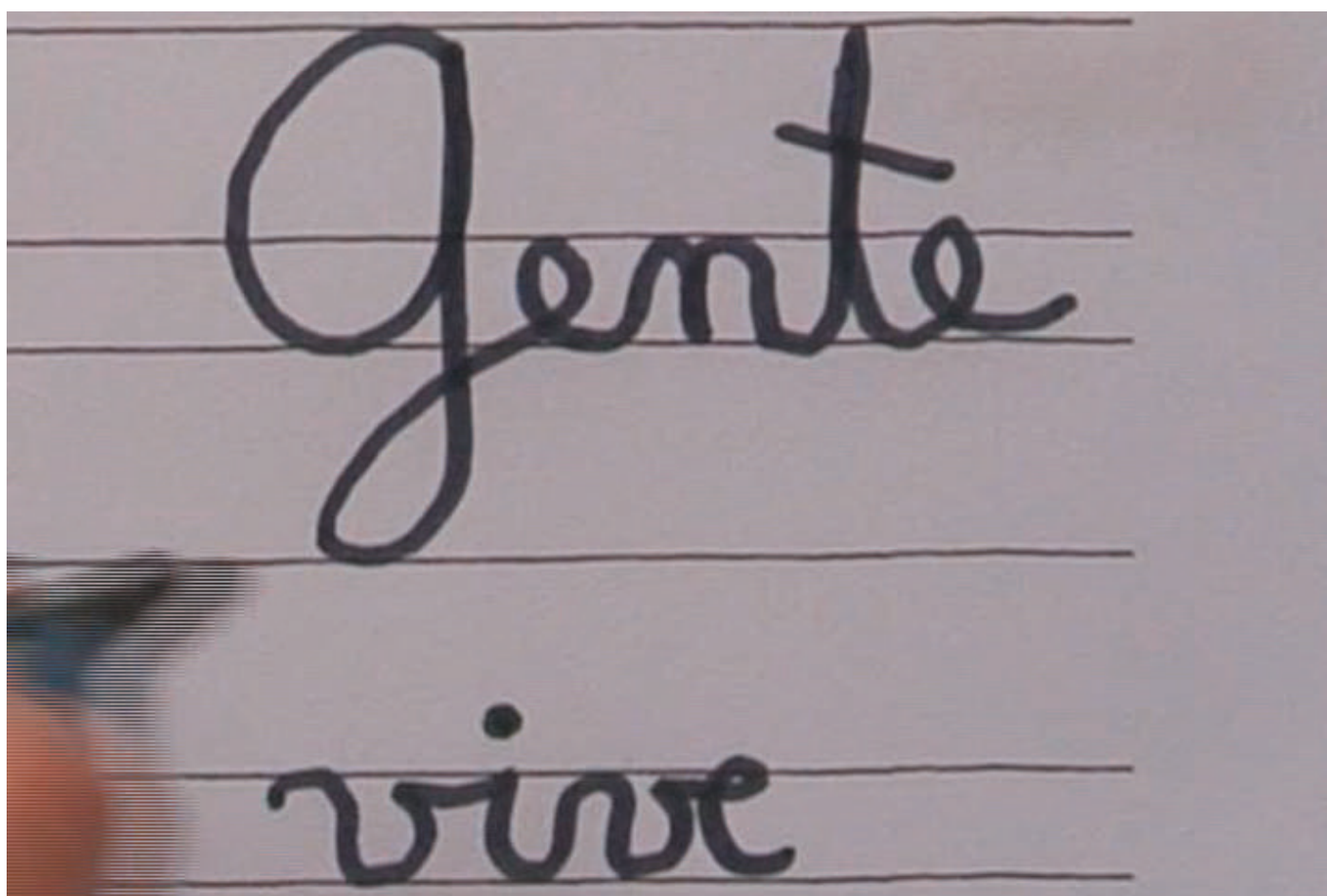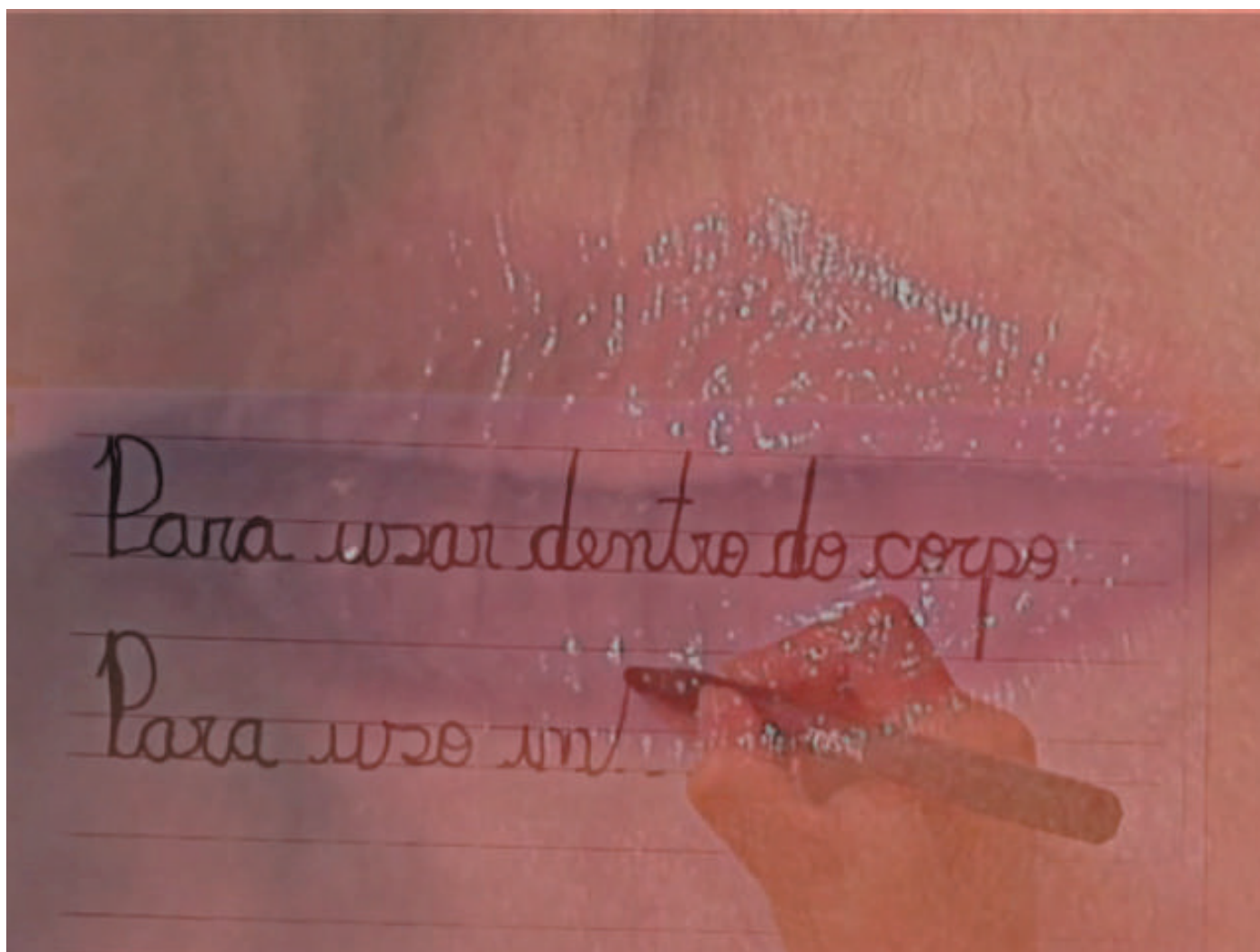
LITERACY, 2010

Joy of Reading, a system for literacy of the Brazilian Portuguese language consists of 242 video that try to ll the education gap in Brazil. Currently it has a monthly average of 1,070 daily hits on the Internet, and has been growing continuously.

To watch the videos, access

https://www.youtube.com/watch?v=APbN5uVV0as
https://www.youtube.com/watch?v=I88_R6AlXsI
https://www.youtube.com/watch?v=L3mgpRNrhLc

ele usa
os sapatos

nós usamos
os sapatos

GILBERTO DIMENSTEIN

SEE TO READ

A new technology for adult literacy is proposed to change the board and the booklet for the mobile screen. Short videos mixing words and images are downloaded   the student can then take the lost hours on the bus or train to learn to read and write. This experience comes from Analivia Cordeiro's passion for ballet and computing. Since little girl, I loved to dance and study math. By family pressure, she graduated in architecture from the University of São Paulo. She preferred, however, draw shapes with her body. She moved to New York where she took courses in contemporary ballet. The math helped her to learn techniques to make program-ming of body movements on computers and thus, without knowing it, she was part of the   rst genera-tion that developed video-art projects. With the in-ternet and the arrival of broadband, she would   nd more space to spread their videos, some of them inspired by the movements of celebrities like Pelé and Marilyn Monroe   there is a whole work upon the Pelé's famous bicycle kick. I wanted to reach people who spend much time sitting and must learn to release the body. She was somewhat bored in teaching, and   nally took advantage of the diploma of architecture. She started building homes in the condominium where she lives in Granja Viana São Paulo and there she met the reality of workers, almost all illiterate or functionally illiterate do not understand what they read . After the architecture graduation, Analivia did a Masters degree in multi-media and a Ph.D. in communications. The workers of her works have inspired her to do a post-doc-torate to study on literacy using mobile devices. She created a project with videos for mobile, us-ing the techniques of literacy. I imagine that many poor people could download the videos on their mobile pre-paid. The idea is that the videos were not used only in isolation, but as reinforcement to the classroom too. It is easier, however, develop a post-doctoral than to get the idea out of what the paper. Analivia is looking for any operator willing to disseminate their videos. I am convinced that the mobile phone's screen is a great platform for the future. Until she   nds the telecommunications executives that believe in the power of her videos, it already has a name for her project: see to read.

O _____ come.

O _____ nada?

O _____ não.

O _____ come.

OS

ANALIVIA CORDEIRO

JOY OF READING

Joy of Reading is a project for teaching and learning of read/write of Brazilian portuguese language, through wireless devices. The term illiterate is used to identify the share of the population who does not know how to read and write. As a consequence, illiteracy prevents individuals from effectively participating in society. Teaching and learning reading and writing is the essential tool to ascend to more elaborate ways of thought, knowledge and communication. According to statistics, in the State of São Paulo, only 4,5 of illiterate youngsters and adults attend any reading and writing course. Nationwide, this percentage is yet smaller: 3,9 .
 Folha de São Paulo , June 14, 2009 . Another g-ure indicates that one in every ten Brazilians, at the age of 15 or over, neither knows to read nor write a simple note Folha de São Paulo , September 28, 2009 . This work proposes bridging that gap in our social and educational system. In 1996, when the Law of Directives and Bases of National Education bill was passed, long distance education was introduced in the Brazilian educational system. The goal was: the new technology is intended to generate important innovations in the educational processes, in order to ful ll the aspirations and needs of human societies in the new international scene, in which the knowledge and ability of learning as well as creating solutions are essential aspects for the development and well-being of populations and nations.   Scavazza: 2000, 40 .

Long distance education has proved to be very successful. While regular in-class courses for Teaching Education increased 17 , the same course in long distance modality increased 270 , in the last 5 years. So, there are long distance systems to educate teachers, but none to educate students at the level of learning to read. Joy of Reading tries to ll this education void in Brazil. An electronic reading course system ful lls a basic social need and in this way includes people in our internet-driven society, which currently faces a period of euphoria and at the same time, a challenge. Cyber culture presents itself as partial solution of problems of earlier times, but it constitutes an immense eld of problems and con icts for which there is no clear con guration of any perspective of a global solution. The relationship with knowledge, work, employment, money, democracy or with the State must be reinvented, just to cite a few of the most brutally questioned social forms.   Levy: 1998 .

The central goal of Joy of Reading is independent learning and support to school learning, through wireless devices, for anyone of any age and everywhere in the Country. To take on this challenge, the device must be decided rst. We picked the mobile phone as the most adequate device. The mobile phone, nancially accessible, the most popular communication device in Brazil. It is more familiar and affordable to the larger share of the population than school is, so why not take advantage of this and

transform mobile phones into a tool for teaching/learning? Adapting human knowledge to these new devices, is a huge challenge to the current artists, teachers, scientists and other professionals. In the pedagogical eld, Paulo Freire, theoretical reference, speaks in defense of education based on ethics, respecting dignity and the autonomy of the student. There is no use of rhetoric if educational activity is impermeable to change... the pedagogic space is a text to be read over and over, and interpreted, written and re-written. Freire: 1999, 12 .

DIRECTION

In 2008, it was estimated that there are 50 million functional illiterates in Brazil of which 90 do not attend classes; and the remaining 10 that are enrolled in schools, do not usually nish their studies, belonging to the group of illiterates newspaper Folha de São Paulo , September 28, 2009 . Many of those who complete elementary education still can neither read nor write at a basic level. These are illiterate in the sense that they cannot read or write well enough to deal with the everyday requirements of life. An example, with a grocery shopping list written by a maid, who completed the last year of High School in SP: azeite, queijo, nostra moiveis, bisaquinha, bolacha de maizema, biscoito de povilho, guaranpo, ovos, papel higinico, ervilha . The mistakes denote that the maid does not know the right pronunciation of the words she wrote. Therefore, at rst instance, Joy of Reading is designed for those who have restricted or no access to teaching system and for those who have no interest attending a course at school. At a second instance, Joy of Reading is designed for the ardent followers of the mobile phone technology regardless of age and social group. Illiterate people in general have no access to forms of expression of themselves in the social sphere. To revert this situation it is necessary to invent ways of social inclusion,

as we intend with Joy of Reading. We want to build an environment of collaboration and construction, to achieve through solidarity, a better and fair society.

LEARNING

The acquisition of new information and performance processes provided by learning, leads the student to achieve new social abilities and to create a new subjectivity. Our gestures, sounds, body positions, emotions participate in this process where what we do shapes our language and vice-versa. All this process is built. The person tends to consider his or her self-image as something given by nature, though it is in fact, the result of the person's own experience. One's appearance, way of thinking, environment, how one relates to time and space to pick random examples are all taken by innate characteristics. Instead each important element in the individual's relationship with other people, and with society is the result of extensive training. To walk, read, recognize three dimensions in a photograph are abilities that an individual amasses over several years. Feldenkrais; 1977, 37 . The acquired knowledge that is experienced and internalized by a person, allows this person to re ect about his or her own learning process, and the change process that occurred by comparing the before and after. So, cognition is inseparable from living, shaped by many factors that are not part of school.

The person is not an identity number. The person is a human being, in constant change, going through stages and ways of thinking. A person perceives changes comparing the before and the after. What leads a person to change is curiosity, wonder, unease or necessity. Thus, teaching should consider the construction of a person on all levels of his or her existence, including his or her whole organism. Technology has been linked to our body as if it were a prosthetic accessory.

Posture of people has changed: the head projecting forward is very noticeable. The human relationships were deeply transformed by mobile technology. In the pedagogic process, the mobile phones brought plasticity, the freedom of movement, enabling great exibility in learning and in displacing the body. This way, Joy of Reading considers a simultaneity between the intuitive path the personal student experiments -and the school path where the student is guided by a teacher along an established and tested path.

TEACHING

The world is not static, but it ows and changes constantly. Everyone is experiencing, learning and changing the whole time. These phrases indicate learning and building of knowledge. Knowledge that is individual and social, that results whether from a free and open learning experience or from school learning. In institutional terms, there are innumerous types of courses and schools, on just about any topic or subject.

Historically, it was by social learning that people realized that it was possible to teach. The current alphabet, which we use to write the words is the result of a long process of human need to register facts, ideas and thoughts. Teaching reading and writing in Ancient Greece and Rome, emphasized the mastering of the alphabet to such a degree that learning the alphabet started by calligraphy and by oral sound reconnaissance of each letter assigned by its name. Then, the combination of letters forming syllables, then the combination of the syllables forming the words, then phrases, until they worked on texts. Later on, in the Middle Ages, the letters were taught by their sounds, and not by their respective names. This was the phonetic method. Only in the twentieth century, the phonemic method of teaching where the vowel letters are connected to the consonant letters helping its oral enunciation, as in the Montessori method in Italy. The syllabic method, also taught today, is characterized by the formation of words since the beginning of the process, starting from the joining and building of the known syllables. Rizzo: 2005, 14/15 . In this brief display, one notices that for centuries, the teaching methods, have been renovated and updated.

Joy of Reading, as a plan to renovate teaching of reading and writing, accepts learning from two points of views, at the same time: as a representation of language and as a graphic transcription code of sound units. As a graphic transcription code, learning is an acquisition of a technique. As a system of representation, learning it is an appropriation of a new knowledge object, conceptual learning. In this way, we diminish or minimize the generation of illiterates. In this renovation effort, the device that we chose to ll this social void in the learning system is the mobile phone and other mobile devices of recent technology. Many Brazilian enthusiasts are willing to follow this trend in this direction. We cite two independent examples. In the city of João Dias, in the State of Rio Grande do Norte, when a student succeeds, he is awarded with access to the internet, which is very rare in this remote locality newspaper Folha de São Paulo , October 22, 2009 . Glaucia Brito, from the Federal University of Paraná, says: Paraná is ahead of the other states because they made computer accessibility unlimited. They must listen to what the teachers have to say, what they need, beyond offering a consistent pedagogical program to use this structure appropriately Magazine Revista Carta Capital , June 3, 2009 . Both examples support the idea that people are giving up a passive attitude in front of the television screen, for an active and social attitude on the Internet. A new culture is emerging, one which involves much more than just pop culture of music, MTV, and the movies. This is a new culture in the broadest sense, de ned as the socially transmitted

and shared patterns of behavior, customs, attitudes, and tacit codes, beliefs and values, arts, knowledge, and social forms. Tapscott: 1997, 55 .

Information becomes culture if we have an attitude characterized by careful evaluation and judgment. This happens with the Internet, when information is criticized and transmitted in a non-passive and democratic manner. As a consequence, we are experiencing a reformulation regarding authority and hierarchy. From pedagogical point of view, this attitude modi es the teacher-student relationship leading to important questions. How to deal with students curiosity? Which sources will be tapped to satisfy this curiosity books, dictionaries, computers or questions to other people? Answering these questions, students and teachers will need new forms of learning.

In Joy of Reading a new tool to teach is the use of music and poems, seen as semantic/syntactic units to be learned as a whole. Music and poems not only get young people interested, but they are part of the family traditions. As an example, the song Asa Branca, is so signi cant to the northeasterns. Music and poetry also contribute to the spirituality, which mostly comes accompanied by happiness. There is a relationship between learning and hope. To our delight, I hope that teacher and the students can learn, teach, produce and overcome the hurdles together. Freire: 1999, 75 . The old can be renewed maintaining its identity, and be admired as a new way. In this context, what role does the teacher have? The role in helping to structure thoughts and providing tools to communicate them. Thus to think properly becomes an act of communication that implies an object and the people who think about this object. Learning to read is essentially to think properly, to understand the relationship between the spoken word and the written word, which requires students reasoning. For this, the student's abilities, both rational as intuitive are mobilized, including his creativity. This

is why learning is a process where the construction starts from within, where knowledge is not acquired from a teacher, but from the student's own construction. For successful learning, the teacher must, in one hand, support the student con dence in their capacity to learn; and on the other hand, encourage practicing reading and writing, through which the skill and ability will be acquired and consolidated, especially when the subject is of interest to the student. This way, the most updated didactic position is that of one learns by solving problems .

Reading is a logic operation, while teaching and learning to read is a relation of love. Reading depends on the perceptual motor development while teaching/learning to read and write depends on organic maturity. Joy of Reading intends, not only to teach reading and writing, but to participate in a great solidarity network as the Internet, creating possibilities to extend human awareness.

READING AND WRITING

Learning to read and write is acquiring the skill and comprehending the meaning. Teaching the skill of reading and writing, traditionally, presumes the following stages: pre-syllabic1, pre-syllabic, syllabic and alphabetic.

At the rst pre-syllabic stage the expression is through drawings; and then transitions to graphic signs. In this transition, the student realizes that writing is not drawing. Thus, the pre-syllabic level has two parallel paths: realizing that alphabetic letters play a role in writing and an understanding the link between the speech and the written text. Having dealt with the pre-syllabic, child may be able to represent each sound with a letter or syllable. The relation of similarity between the sound and the speci c letter occurs later. The frustration of knowing how to write and not being able to read what other people write occurs moving from the pre-syl-

labic level to the syllabic level. This issue inhibits the socialization of writing: the incapacity to read what other people write syllabically, and the incapacity to read what the literate people wrote. The transition between the pre-syllabic and the syllabic levels is realizing that a word is always written the same way with the same letters, in the same order. At the alphabetic level, the student discovers that each syllable does not correspond to a letter and focuses on discovering how the syllables are written. What de nes the syllabic level is the quantitative segmentation of the words both in graphic signs and in oral-lip movements when the mouth pronounces it. For the student to master reading and writing, he or she must conquer the stage of seeing the syllables separately and visualize the word as a one. Only the comprehension of the syllable gives meaning to the word as an element of a triad: from the letter to the syllable to the word and in the opposite direction. Therefore working these three elements simultaneously is fundamental for any level in teaching and learning how to read and write. These stages of learning require technical skill, described above, accompanied by knowledge of the meaning of words and the broadening of the student's vocabulary.

Reading is not just deciphering symbols. Reading is extracting from the written text, the author's thoughts. A word is not an agglomerate of sounds, it represents an idea. It is important to observe that the acquisition of reading and writing is not simultaneous, neither is it linear. Therefore, what matters in learning is not the mechanical repetition of the gesture, but the understanding of the value of feelings, emotions, hopes and expectations, certainties and uncertainties.For example, when a student chooses his vocabulary, a sense of self-con - dence is strengthened. For this reason the material chosen for teaching is very important. It must be of the student's interest, the content must have a

meaning that touches the student's life. Hence we chosed music, poems and topics of everyday life as didactic material. The Joy of Reading project consisting of twelve themes and revisions. Each theme is subdivided in various videos as exercises:
1. Velocidade poem
2. gua mole, pedra dura, bate bate, até que fura proverb
3. Revision 1
4. Recipe for an pudding
5. Asa Branca song
6. Revision 2
7. Music O Pato
8. Brasília Amarela song
9. Revision 3
10. An user's guide
11. Our Father prayer
12. Conclusion

The goals of Joy of Reading, are:

to teach reading/writing and/or supporting school learning,

to re ne perception of reality regarding the world of writing,

to connect written word to meaning, battling high rate of functional illiterates in Brazil,

to stimulate creativity,

to enable each student to discover his or her talents and ways he or she can extend his or her personal possibilities, according to their needs.

to encourage and to nurture freedom, independence and motility,

to increase self-assurance, self-con dence of the students,

to encourage appreciation of local culture with music and poems,

to enable deaf to learn through lip reading,

to perfect word pronunciation,

to constitute a space to build a better world,

to use technology of lower cost to permit access of target public.

DEVICES

In order to reach our goals, in the idealized modes above, we dispose of cellular phones and videos as central pedagogic instrument.

MOBILE PHONES

The mobile phone is the most important, most popular and numerous device today, throughout the world. The mobile phone reaches most inhabited areas of the planet and the numbers of users increase daily at breakneck speed. Hence it is the mass media with most powerful social penetration. It reaches all social classes and all age groups. The cell phone language, videos, SMSs, e-mails, photos, is familiar to all its users. Young people are the ones who most use the communication of mobile phones' resources.

The mobile phone user considers access to information and personal expression as a fundamental right. This is essential for those who wish to learn. On the other hand, acquiring knowledge via a mobile phone/internet is crucial when we refer to more popular classes, where there is a lack of experience with books, which hinders the alphabet learning by traditional means. A nal observation: the basis of this system is listen to young people needs, the future users.

VIDEO

Video is supported by images. Images in the broad sense of the term are described: images signify two closely related things. We have images when we use the sense of vision. We physically see objects, as objects d'art, sculptures, paintings. And we also talk about images in a universal sense. Our thoughts, inventions and fantasies are sensory images, that come without the physi-

cal presence of the image. Images can as well be still, like stones or they can be action full like living bodies.   Arnheim: 2000; 167 . Based on this concept of image, in Joy of Reading, learning through videos is complete. It transmits the visual image of the study object, how to read it and how to pronounce it the mouth saying the name of the image , its spelling and the final result of the written word. It reaches the object and its meaning. It is dynamic and appealing. It is challenging and captivating. It speaks the language of the young people of our society.

The words are chosen according to their appearing in the music, poems or other topics being studied at that time. This way we establish a rich meaning connected to the students personal life, cultural origin, and his or her emotions. The association between the object and its name is a very enriching activity used in teaching and learning to read and write. It must not be repetitive and limited to just a few objects. Repetition does not produce learning. It is the establishing of multiple relations that generate knowledge in learning to read and in life. Our videos try to establish a conversation with the student. For this, the nalizing and the presentation of the images is homely, fostering our approximation with the student and a familiar tone in the teaching learning process. Important: deaf people also can learn from lip-reading all the material to be studied.

TESTIMONIES

To consolidate the reading/writing project   Joy of Reading   Eleonora Sampaio Caselato, who was invited to participate, wrote: Collaborating with Analivia in this teaching learning to read and write project gives me the opportunity to complement my twenty year work with children in public and in private schools.

The greatest challenge has been to prepare lessons for people I don't know, of different ages, and with an array of interests. The students must be given the certainty that learning to read and write is an individual process which depends on their effort, under good guidance. The expectation of reaching out to these people, to interact with them, to give them that certainty, encourages me to invest more and more time, disposition and experience in to Joy of Reading project.

RENOVATION

We consider at present, that a renovation in the way of teaching is legitimate; and an updated analysis is necessary. The teachers' role is not to supply instant answers, but to build the atmosphere where the structuring of knowledge comes as a result of the students' own actions. To offer these conditions, one should know something about how the human body works. The body interacts intensely with the brain, and both interact with the surroundings. The relation body/mind is mediated by the movements of the body and by the activity of its perception senses. Internal or external movement of the body is perceived when positions of parts of the body are changed in relation to space. This change results in muscular activity which happens when conscious effort is directed to that movement, being that whatever movement done alters not only the part of the body that moved, but the body's entire complete organization. Without awareness, a baby would not develop and stand upright and would perhaps not survive. The organization of standing upright and walking are considered as the most complex activities the brain executes in a lifetime. Learning to read and write also demands a complete mobilization of the body, requires integration between the conscious and unconscious mind. Integration, coordination,

interconnection are interrelations that require a non-linear form of thinking, analyzing and understanding. The memory is one of the results of these interrelations indispensable in learning to read and write. No one really knows how the memory works, but we all know that if a fact can be described is because it was experienced. Experience is constituted of the integration, coordination, interconnection of sensory sight, hearing, taste, smell, touch, and kinesthetic perception of space, of body movement, of surrounding objects, amongst other elements. The result one can say, is in the memory. The memory works through images, in the ample sense of the term. Bachelard, puts it best when he describes a type of image:
 The poetic image is not subject of an internal truth. It is not an echo of the past. Through the brilliance of an image, the distant past resounds, and it is hard to know how deep these echoes will reverberate and die. Due to its novelty and action, the poetic image has its own dynamics.   Bachelard: 1994, 17 . When one remembers, one relives the experience in the mind and in the body, adding to it. Memorizing is not a passive process of saving or storing, but an active process or re-categorizing and valuating founded on previous categories, in which thoughts, images, emotions and stored sensations are related and connected. We intuitively know the importance of the memory for teaching and learning.

The complexity of our organism must be considered as teaching takes place. When using mobile phones the content is assimilated by hearing and by seeing videos, thus Joy of Reading will cast knowledge in visual and audio images. Sight occupies such a large part of intelligence, it takes up nearly half of our cortex. Our visual intelligence interacts profusely with our rational and emotional intelligence, and in some cases it even precedes or directs the intelligence. Hoffman says, Sight

is not a passive perception, it is a process of active construction... the main difference is that scientific construction is conscious, where as that of the visual intelligence, is by at large, unconscious. Hoffman: 1998, 12

Active construction, active perceiving of the surroundings, is adjusting the body willingly to assimilate signals. The body actively changes: perceiving is in the domain of activity over surroundings, it is more than just receiving these signals passively. It is in this realm that learning, in its broader meaning, has its significance. In other words, our development from early days, the design our cerebral circuits, that represent our body and its interaction with the environment, depend on the activities we perform and of action of the innate

Bio-regulators circuits and how they react to these activities. We can conceptualize learning: complex organisms put in complex surroundings require a great repertoire of knowledge, the multitude of choices for answers, the ability to construct complex combinations of answers, and the ability to plan in advance to avoid situations that are disadvantage and to promote favorable situations, including for survival. Summarizing using an Asian saying: I listen and I forget, I see and I remember, I do and I understand.

Just to complement: Learning to read is not a difficult task, and it is not for nothing that adults have more difficulty than children, whose brains are still developing. Researchers from Spain, Columbia and England recently unveiled what happens in the brain when learning to read. The content of this study is intriguing: it is the exam of images of 20 Columbian guerrillas, who were trained to read when reintegrating in society. According to Nature article, as these guerrillas had never re-

ceived any form of education, their brains were intact in terms of any training process and ideal for the study. Compared to other 22 literate individuals, the literate adults have more grey matter in areas associated to visual, speech and semantic processing; they also have more white matter in the region associated to reading. It is not only their structure that differs: reading increases the connections between the right and the left side of the brain. Reading allows the gyro angular to modulate the functional interactions between processing images and discourse. Now it will be possible to re-evaluate the image of people with dyslexia: until then, it was impossible to know whether the alterations observed were cause or consequence of the difficulty in reading. FAPESP magazine, São Paulo, November 2010
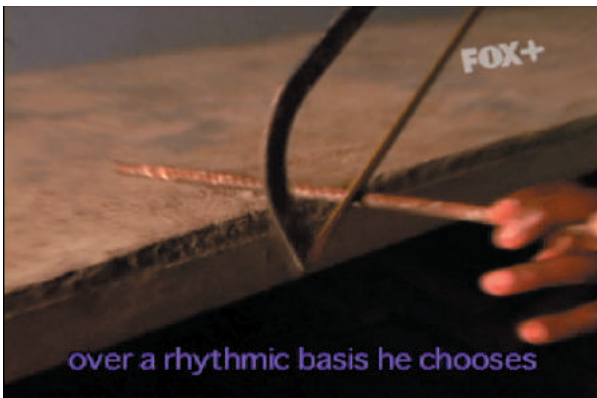
CONCLUSION

In pondering our future we are tempted to limit our attention to the curiosity about inventions and discoveries awaiting us. This, however, would be narrow-minded. What we need is a wider view encompassing the coming rewards in the context of the treasures left by the past experiences, possessions and insights' Arnheim: 2000, 168 . This way, despite utilizing new inventions, we respect all the teaching tradition. We are between the existing knowledge and the knowledge yet to be constructed. For example, one topic without definition is the system we will use to evaluate the knowledge assimilated by the student who uses Joy of Reading. To finish: Love is our biological foundation and only base for conserving our human quality as well as our well-being. Maturana: 1999, 127

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where the sounds comes from:

and sees the images

over a rhythmic basis he chooses

the person enters in a sound booth

the workers movements

DJ MOBILE, 2005

When the rst cell phones were launched in the market, some artists used this new technological support to create works of art. DJ Mobile is a pioneer art application, developed in 2005 when mobile apps were not popular, and 4 years before the rst Smart Phones devices.

In DJ Mobile, the public creates a song with sounds produced by a building under construction, and recorded audio and visually. To make this, the sounds are chosen to compose the melody over a rhythmic foundation, which can be hip-hop, samba or rock. The result is a video with takes on the construction of a building and the music composed by the very sounds recorded and reassembled. For example, a hammer hitting a nail makes the percussion sound. The resulting video can be shown on a big screen for everyone to see.

This work was commissioned by Nokia. And the public composed 350 pieces with DJMobile at the launch party, all composed in 12 hours.

To watch the video, access

https://vimeo.com/46555572

Analivia's inicial idea
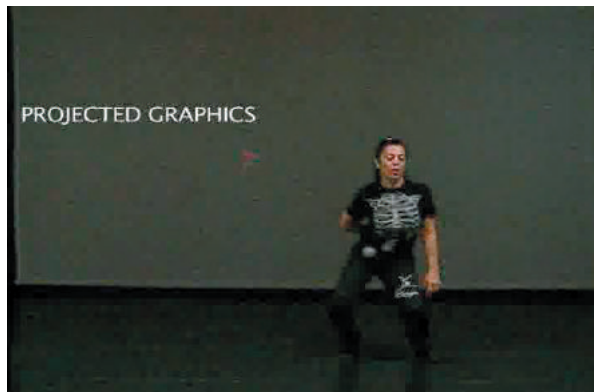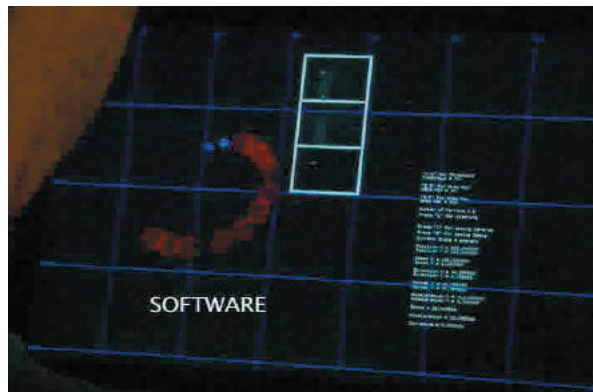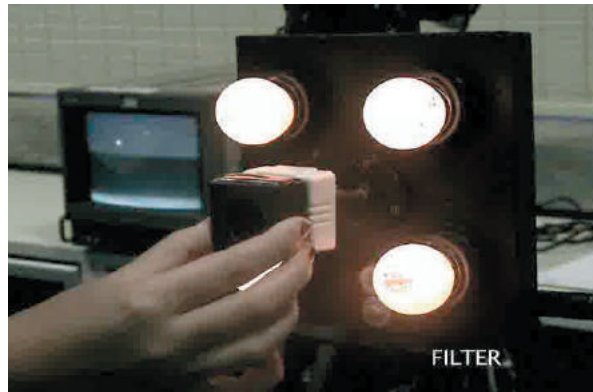
UNSQUARE DANCE, 2007

The body movement is recorded by sensors distrib-
uted on the body and manipulated by a VJ in real-
time, creating paths with different textures. For a
detailed explanation see text attached. The creative
team was: Luiz Velho, Julio Lucio, Alice Bodansky,
Ilana Paterman, Thomas Guedes and Analívia, and
took place at the graphic visualization laboratory
of the Institute of Pure and Applied Mathematics
 IMPA, Rio de Janeiro.

To watch the videos, access

https://vimeo.com/46554657
https://vimeo.com/47400960

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ANALIVIA CORDEIRO
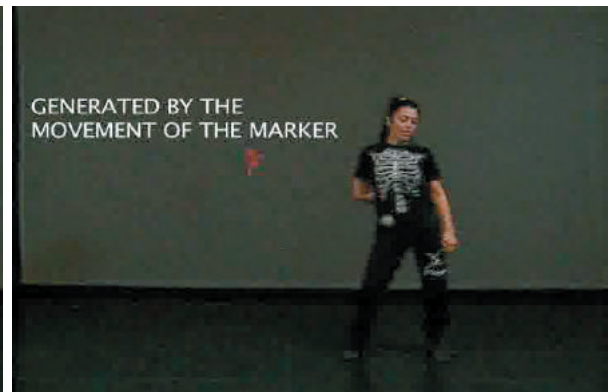
UNSQUARE DANCE

Unsquare Dance results from video camera registration of infra-red light, capturing the movement of markers positioned at body joints. This caption is transmitted to a computer that runs the software X-Motion, showing the result in a screen, in real-time. How did this work appear: motion language broads body spatial changes, from delicate gestures to expansive ones, that are captured through our eyes visual persistence. This interpretation is ancient: the Greek saw dance as drawing in the space. The movement trajectory exhibition is secular: the Polinese male dance, Sivanofaoti, describe circles with re torchs. The movement study by its trajectory is recent: it starts with photographic registers of light, moving in the dark. With the computers, this register improved, as it could be submitted to diverse analysis of time and space. This project was born from Analivia Cordeiro observations, based on her practical-theorical studies of human motion expression allied with electronic media, who points to the need of giving texture to the line that describes the motion path in the computer. This point of view, inspired Luiz Velho to create the project Expressive Motion/X-Motion software, that creates different movement visualizations/textures varying as parameters: color, line types, stroke weight, and other effects that can be manipulated in real-time. While the performer dances, the VJ in the computer interprets the motion. One performance can generate many visual results depending of the VJs singular visualizations: X-Motion is foremost an aestetic instrument. Unsquare Dance choreography show the anthropormorphism of the body movement trajectories. I didn't look for references in ballet or modern dance. The movement expression is exactly located on the relationship between the mathematical form of a line and its execution by each individual body. I remark: watching the performer moving, would we be able to see the movement lines without the help of the computer? Not yet. Our eyes are not trained to look in this way to a person moving. We look his/her expression, clothes and colors. The movement motion capture leads to a new way of learning/creating movements, in dance, sports, etc, I believe that the virtues and acrobatics, in the future, will be to describe perfectly circles, straight lines and elaborate shapes. For this the body joints should be free and perfectly coordinates within the unity of the body. What a big challenge Unsquare Dance is a new body-art, placed between the electronic environment instead of ink over canvas. Why? First: without a body it doesn't exist, it is its essence. Second: the result is graphical, the impression of the body; and not the own body. Third: performer/VJ creates as function of body action. X-Motion introduces with property, the performance in the digital world: it respects the organic nature of our body, and, suggest an imaginative/ exible creation. It opens a true new universe.

Jan. 2008

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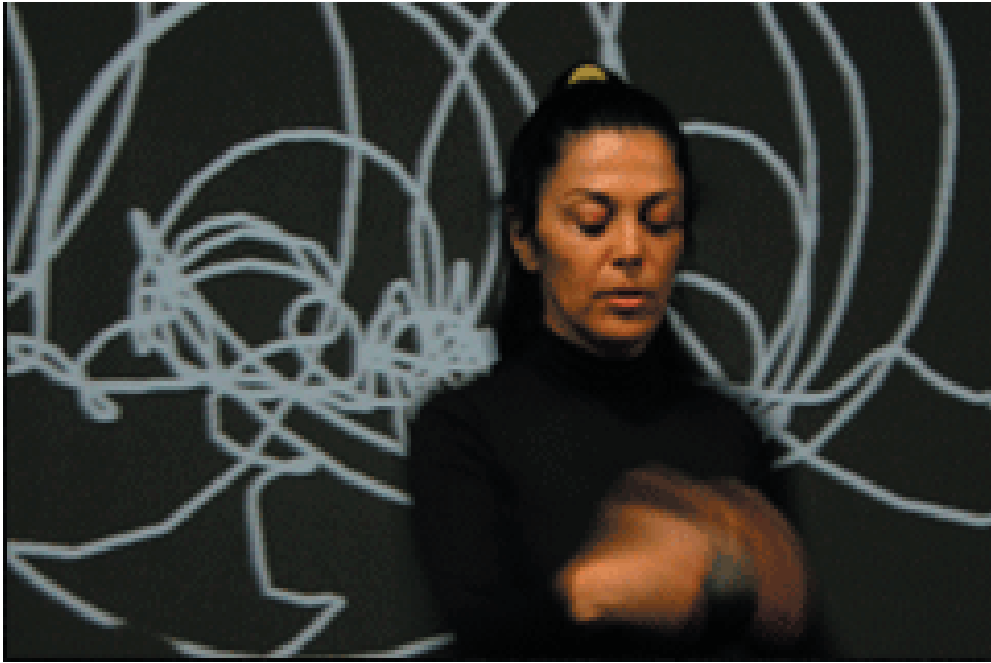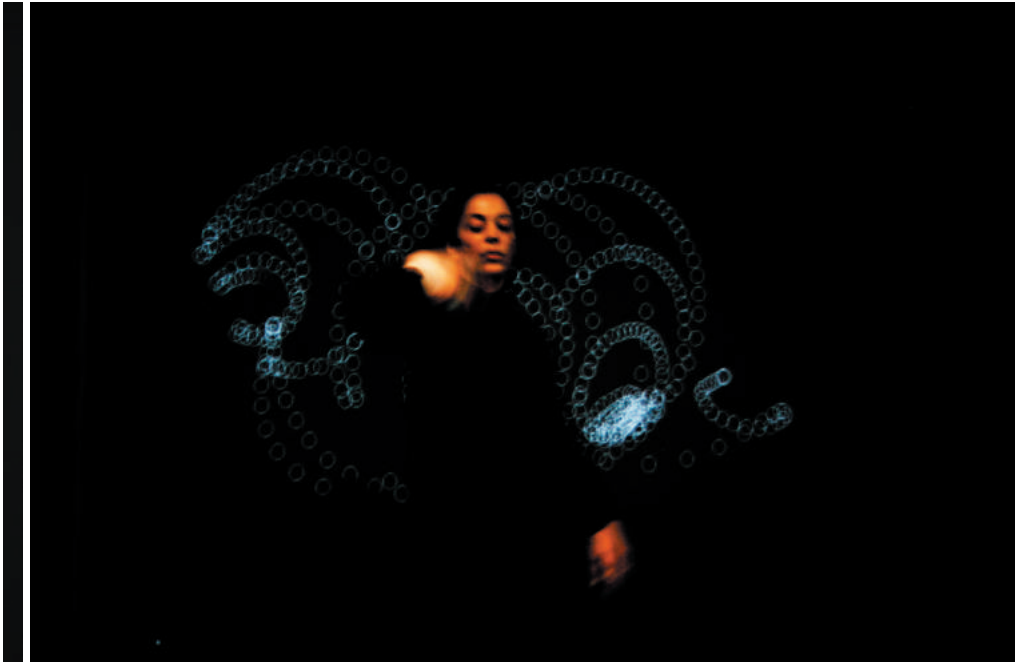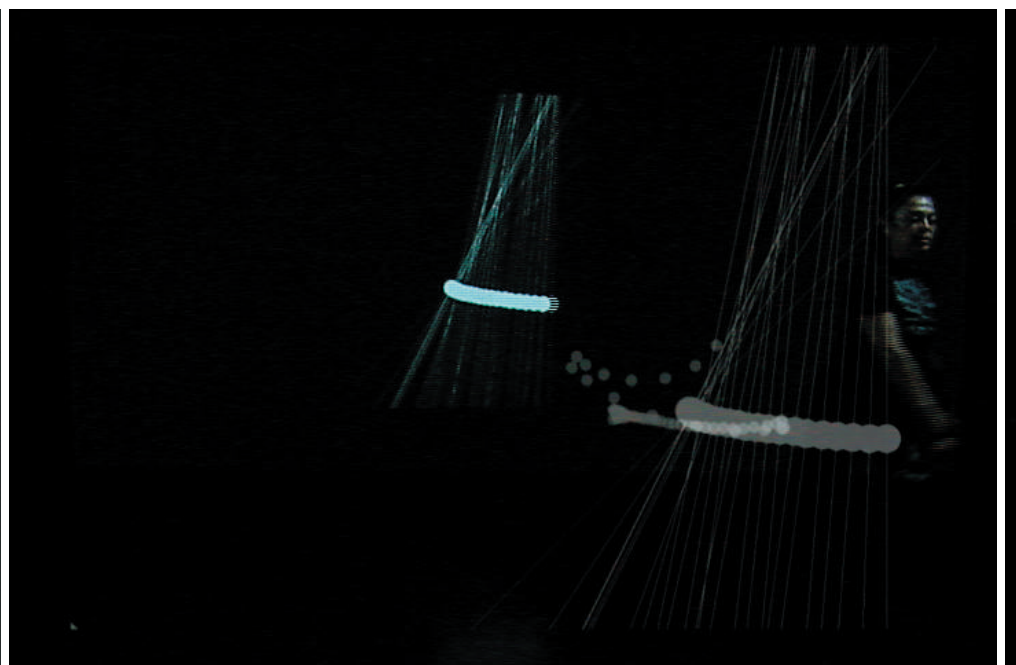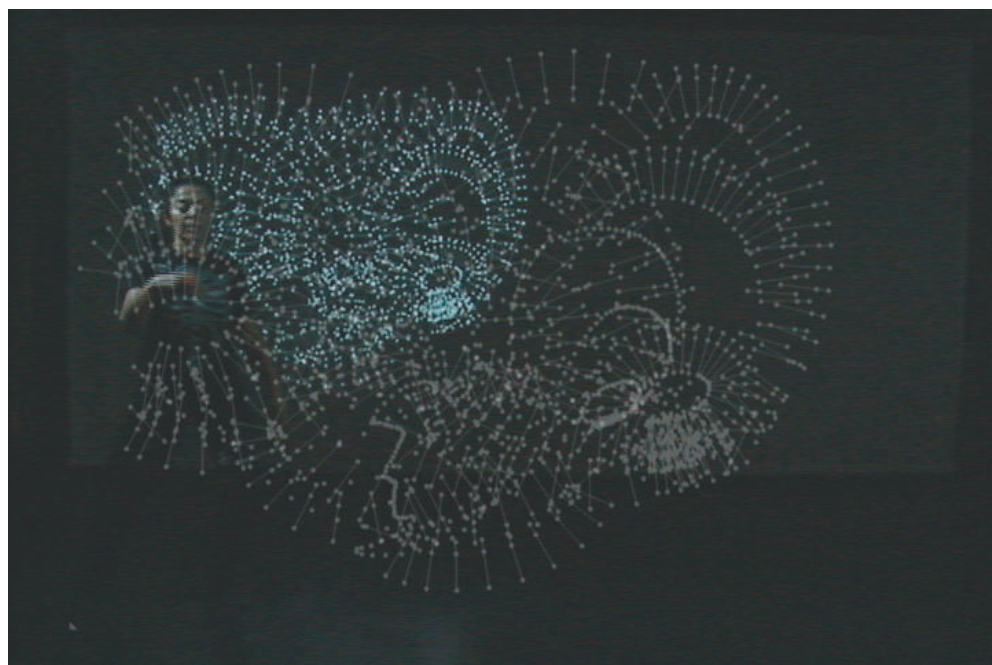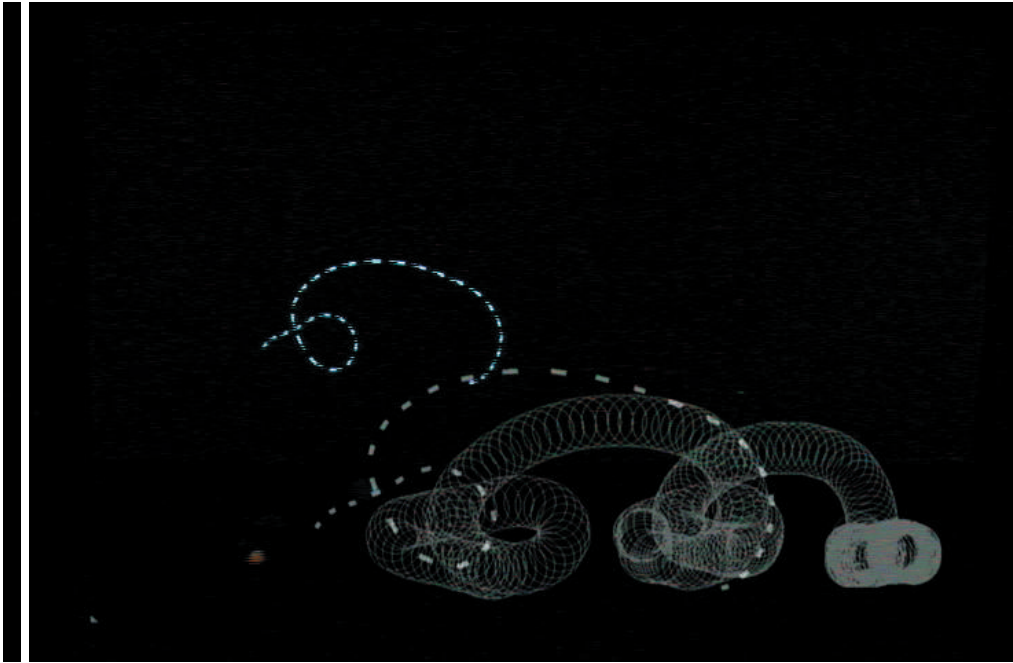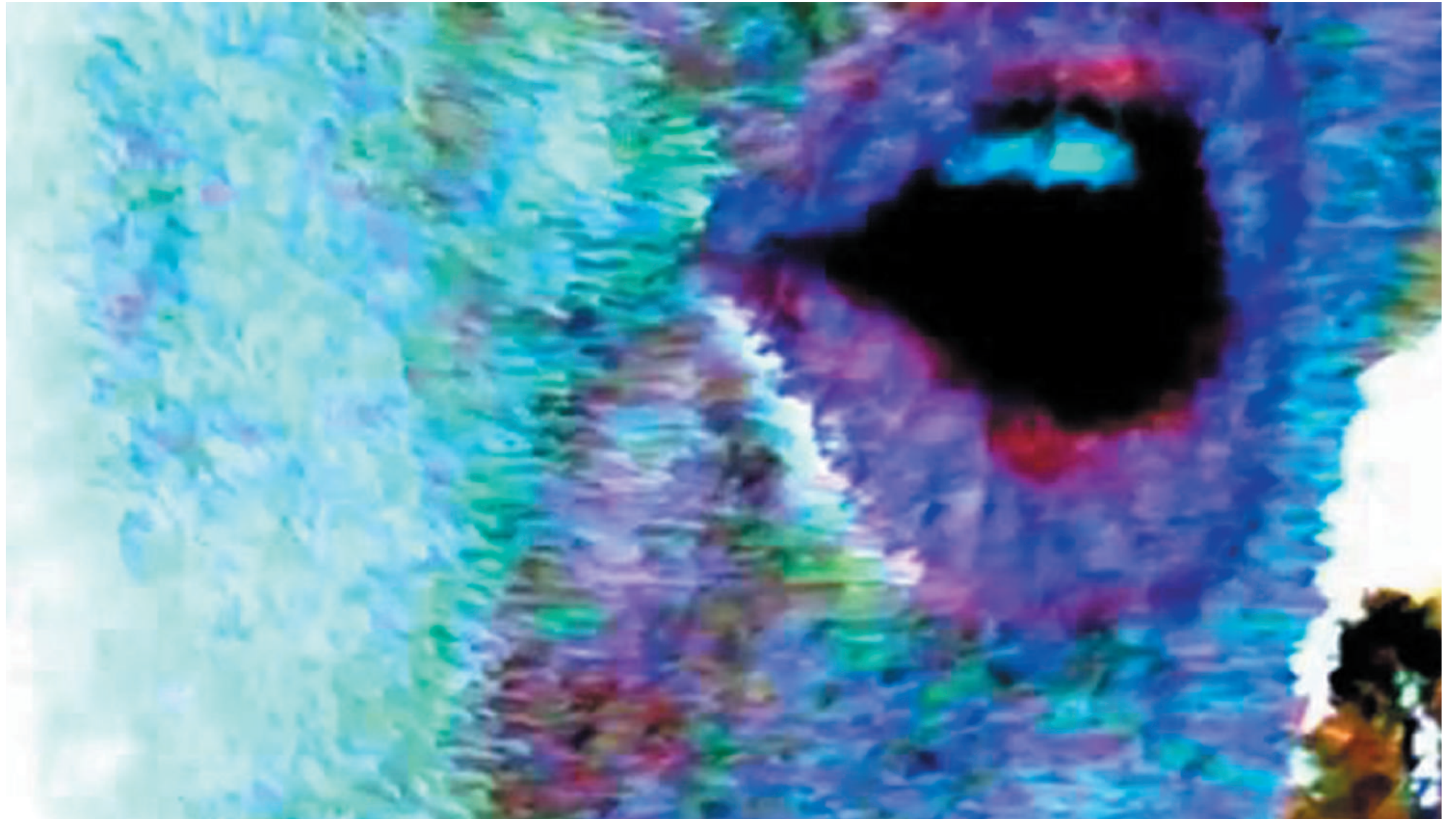
YOU, 2009

The Amudi group of the Polytechnic of University of São Paulo and Analivia met to create this software. A camera registers a picture, which has its pixels turned into discrete strokes, giving a distinctly Impressionist image. A sensor that records the heartbeat of the person of the audience affects the color of the image. The faster the rate, the redder the image and the lower the heart rate the bluer the image. Thus, the interactivity occurs due to the inner body behavior, reaching up to be not controlled, only controlled by special people like by very trained yogis.

To watch the video, access

https://www.youtube.com/watch?v=QP8zgy5_gts
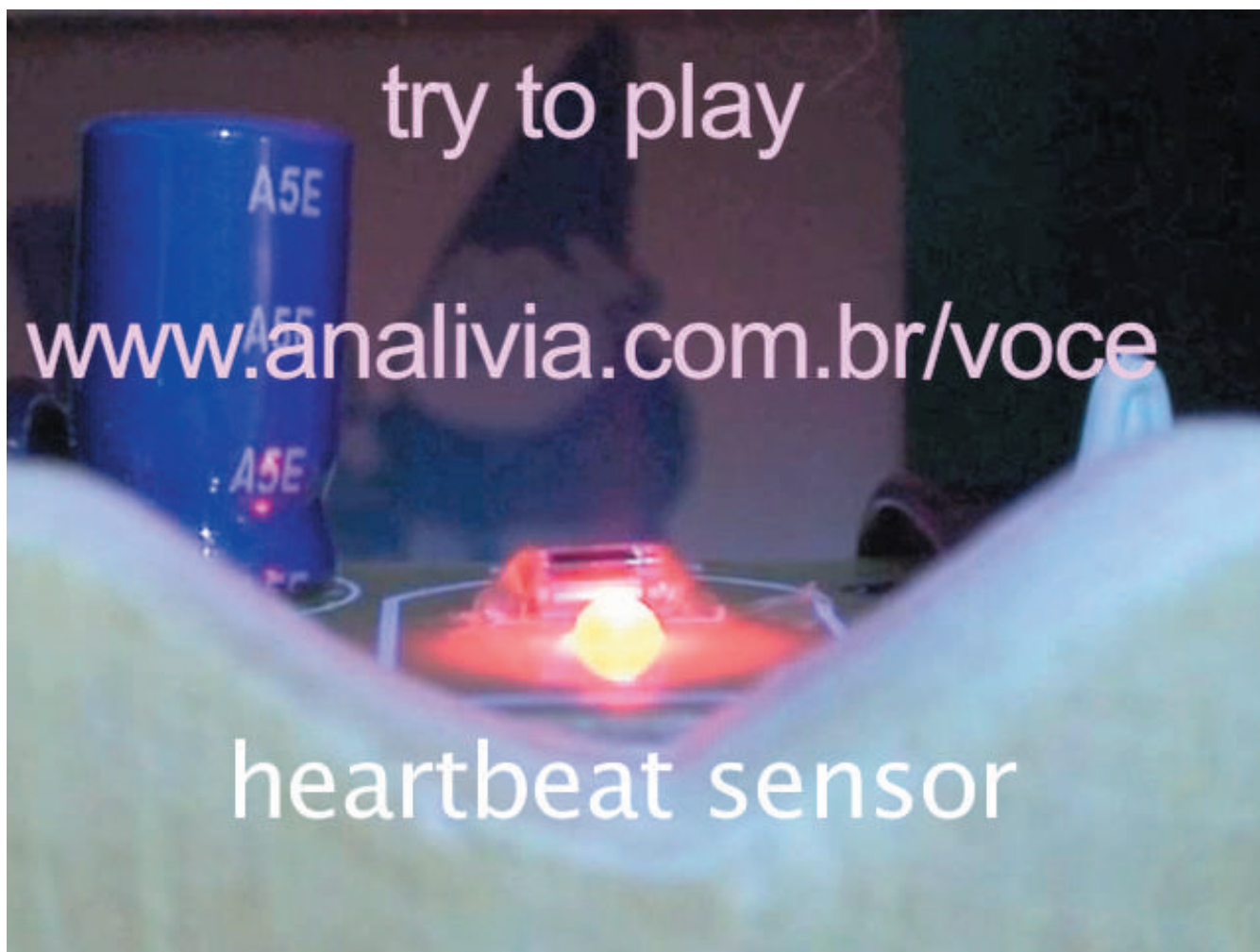
try to play

www.analivia.com.br/voce

heartbeat sensor
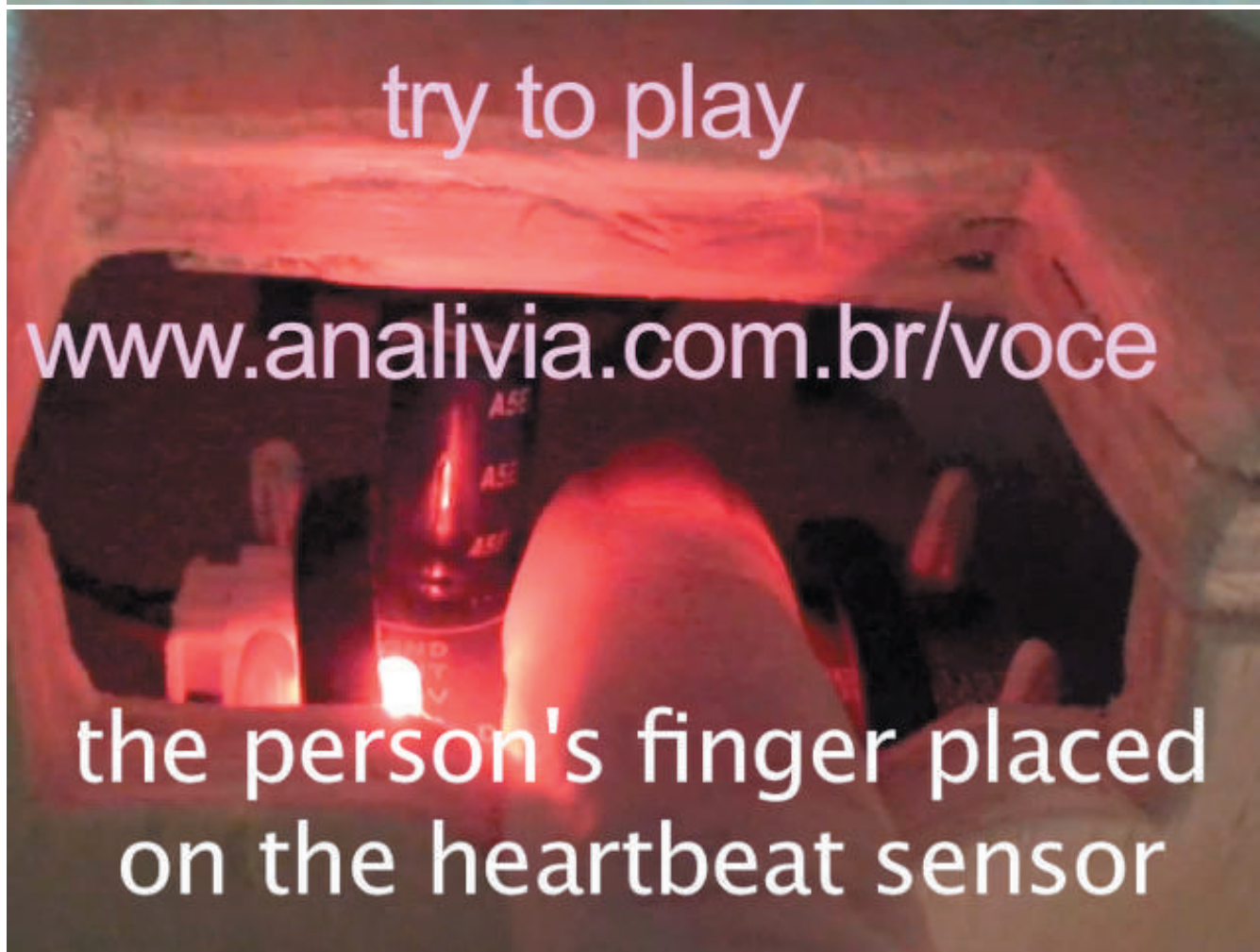
try to play

www.analivia.com.br/voce

the person's finger placed
on the heartbeat sensor

if the heartbeat tends to be slow, the image becomes bluish

if the heartbeat tends to be quick, the image becomes redish
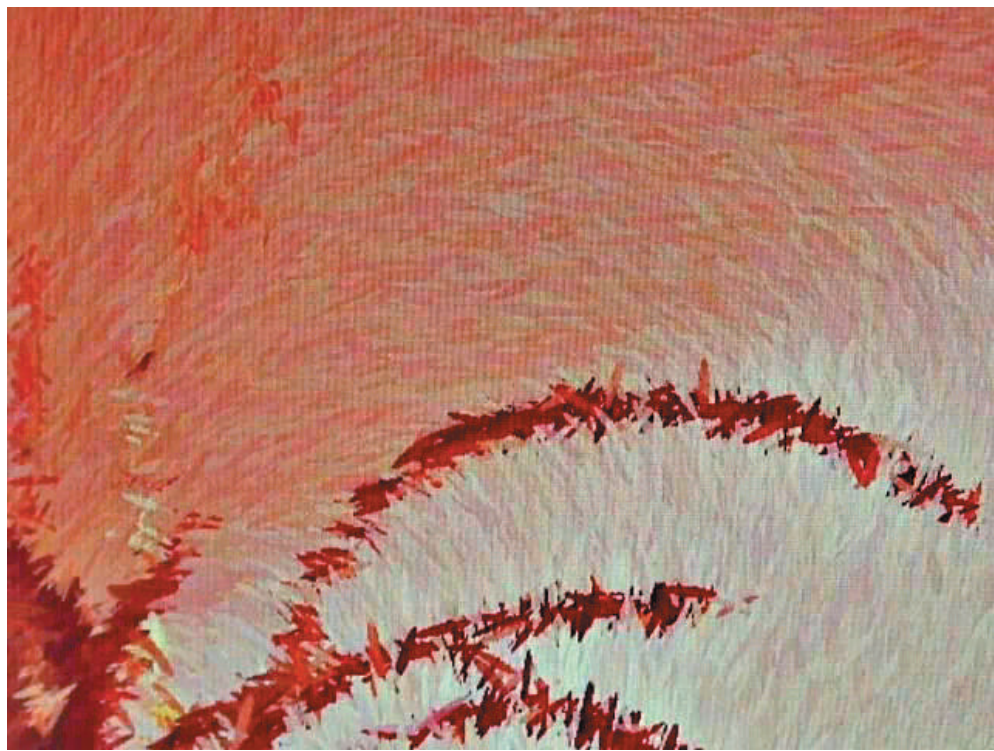
The Girl from Ipanema, 2016 100 x 80
cm, paper and gouache
watch https://youtu.be/wdRTdzzHlo0

Poeme Electronique, 2017
100 x 80 cm, paper and gouache

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DANCING ON THE PAPER, 2016/2018
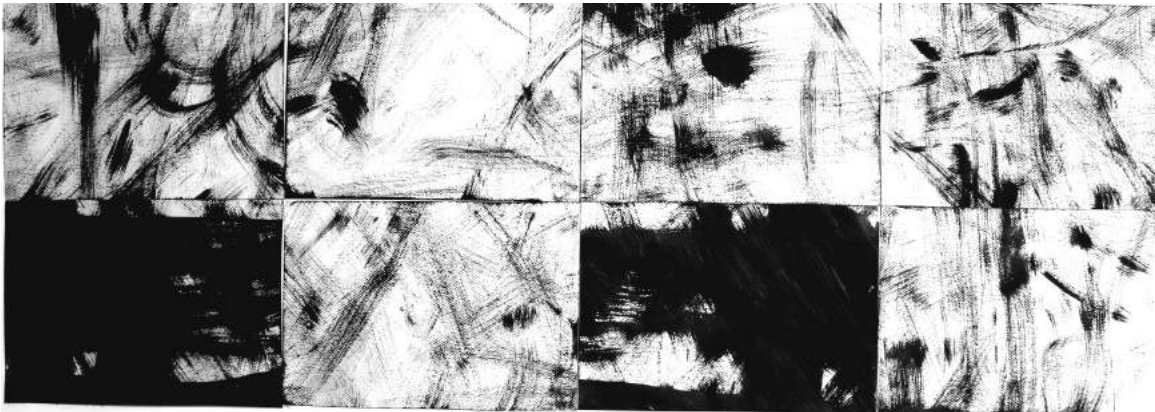
Tools were created by man, from the beginning of his existence, to potentialize the use of his own body. The tools have increased the reach of the human body itself. For example, compass, tweezers, ruler, spear, car, even a fork or knife, and many others. The operation and design of these instruments are often similar to the use of members of the human body to perform daily tasks, such as forceps that resemble two fingers, to remove delicate things. I personally like to attribute a personality to the cars, as the headlights are the eyes, it may look like a man with a mustache, or a sensual woman. Thus, we can see the tools as a design similar to our body.

We have recently seen the use of artificial tools to feed the mind and organs of human perception: calculations, data storage and control, image recog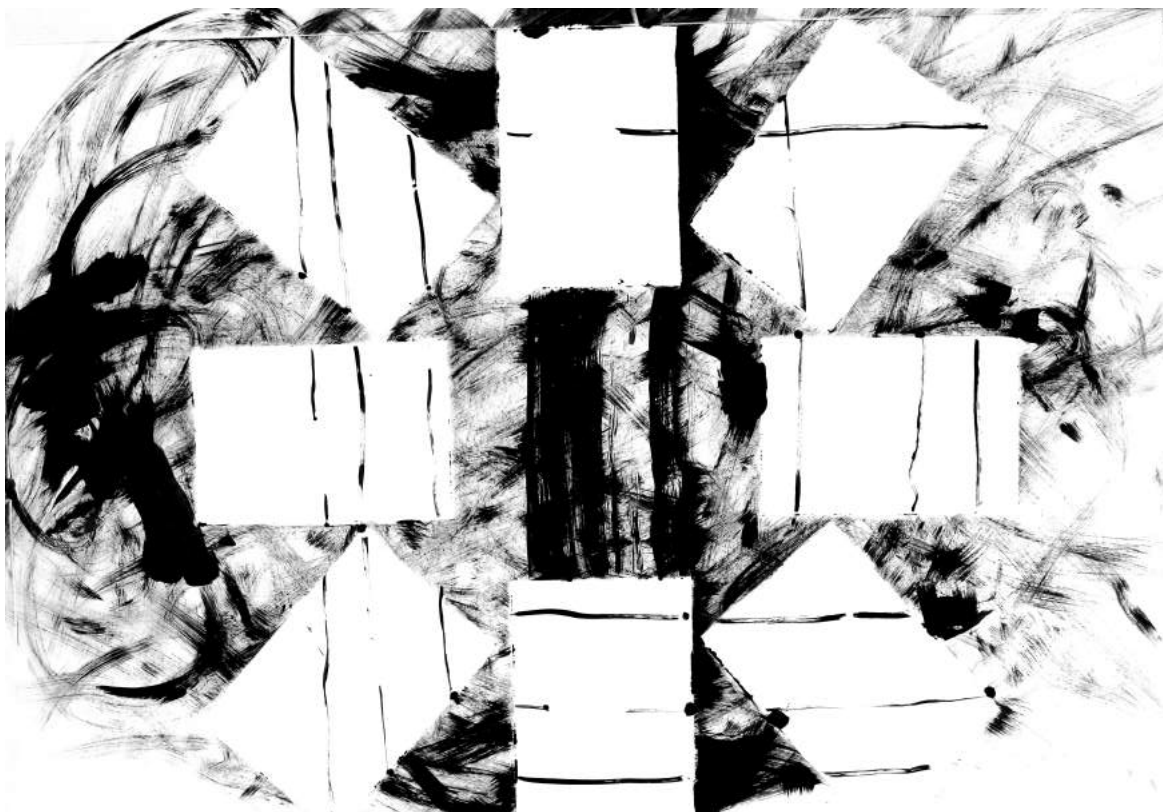nition, high definition imaging, and long distance communication. Using this arsenal of tools daily, we forget the simpler, closer reality that is our own body. Today, I see the need to rethink the body and human action as an expression. Expression of messages, touching the emotional side of man. That's why I decided to use my body to record my expression on paper. There are endless ways of recording expressions like painting, using the whole body instead of just the hands and fingers, or instruments that man has created. The result is a simultaneous painting and video performance. An important detail is that these paintings are made with non-toxic paint because they are applied directly on the body. This is a long-lasting project because the expression changes and renews

XxXxXxXx, 2017 paper and gouache, 120 x 44 cm
watch https://youtu.be/l3gFzBK_MdA

Black Lines, 2017 paper and gouache 100 x 62 cm
watch https://youtu.be/Txl7LRKIqxM

Red and Black, 2017 paper and gouache, 150 x 80 cm
watch https://youtu.be/I-MjAIBswIM
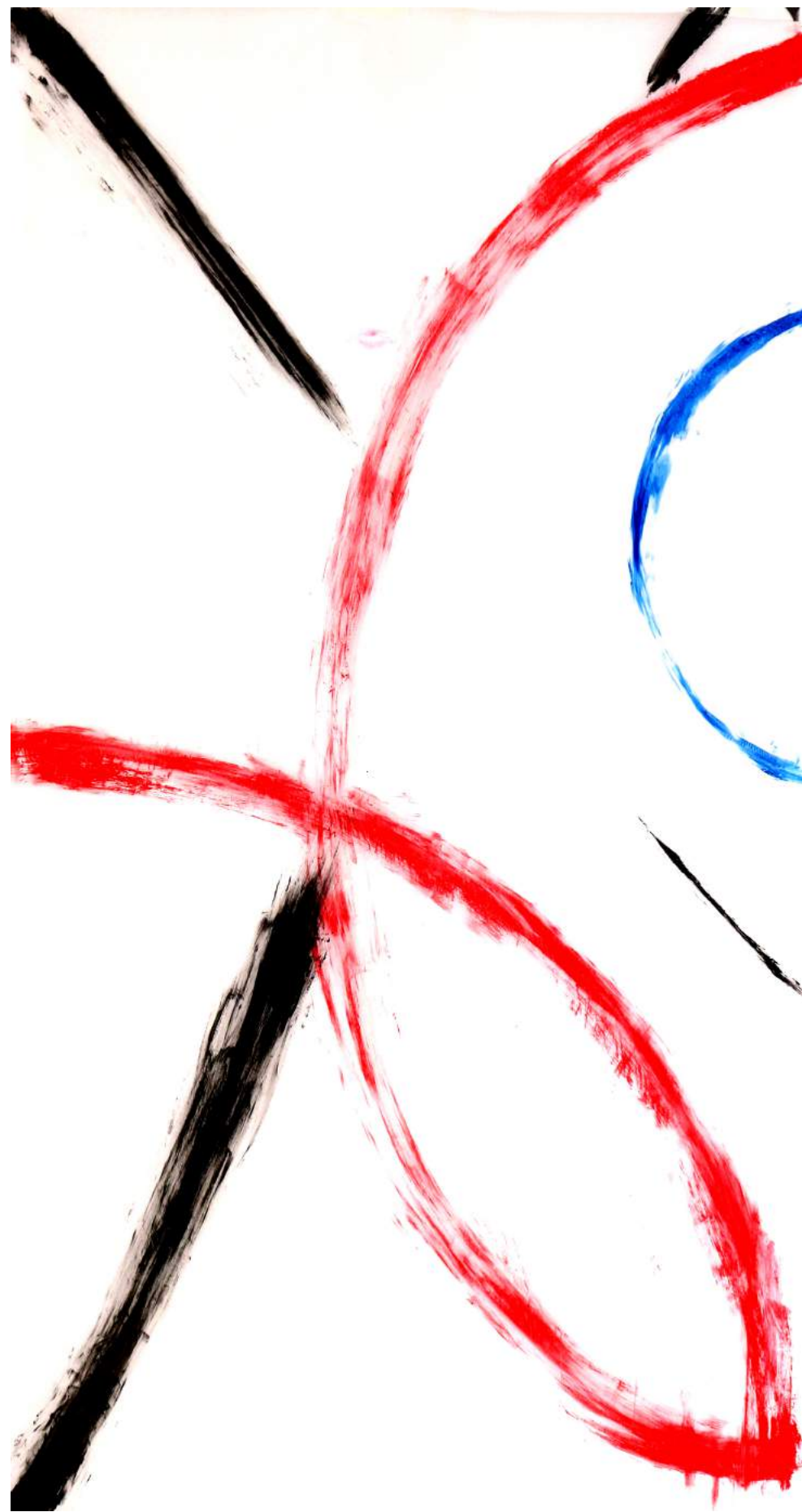
Red, Black and Bleu, 2017 paper and gouache, 150 x 80 cm
watch https://youtu.be/tZJj_XG9Efs
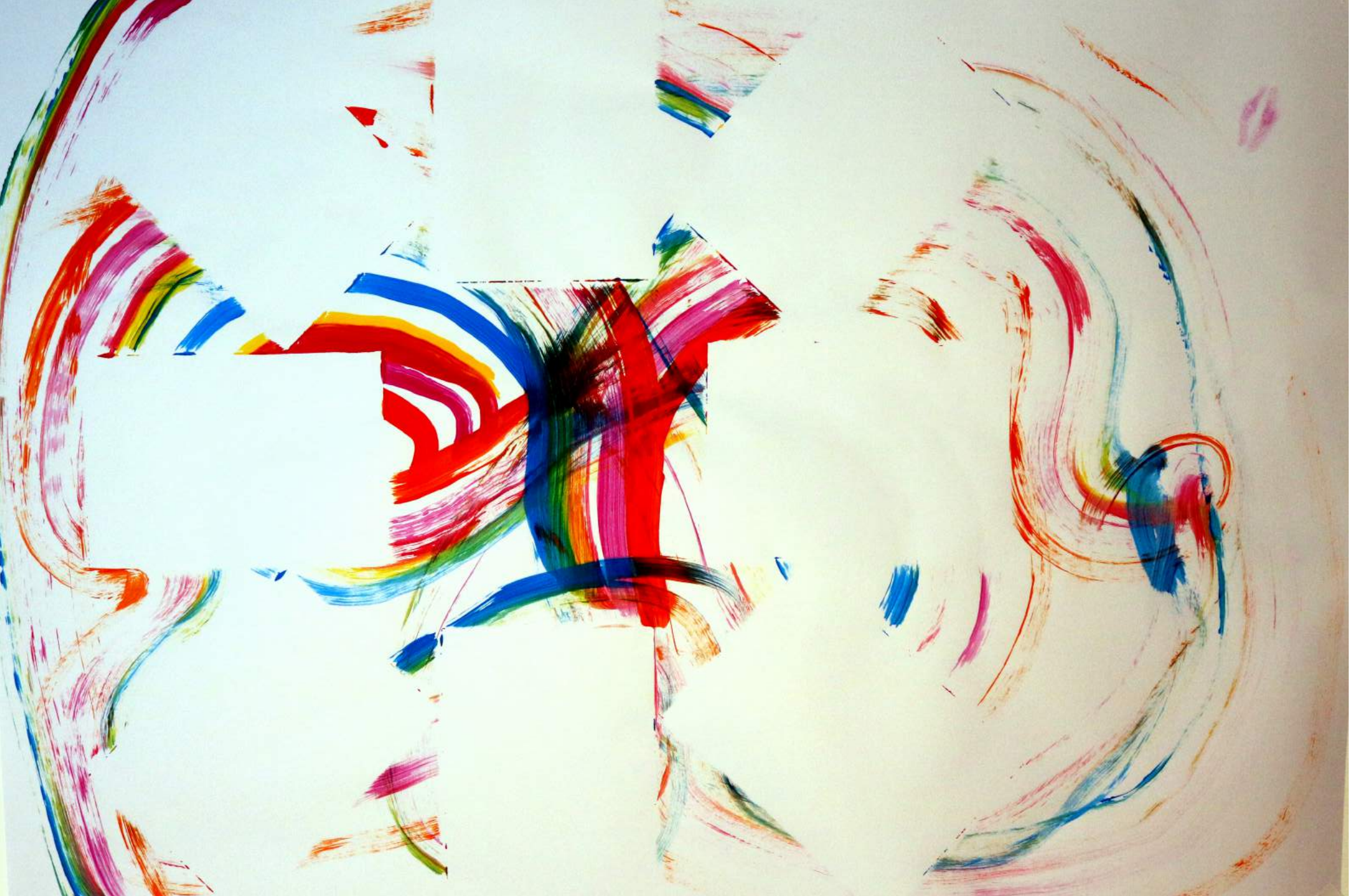
8s, 2018 paper and gouache, 100 x 62 cm

8s, 2018 paper and gouache 44 x 62 cm

watch https://youtu.be/i4U-Ynz7BsA

8s, 2018 papar and gousche 44 x 62 cm
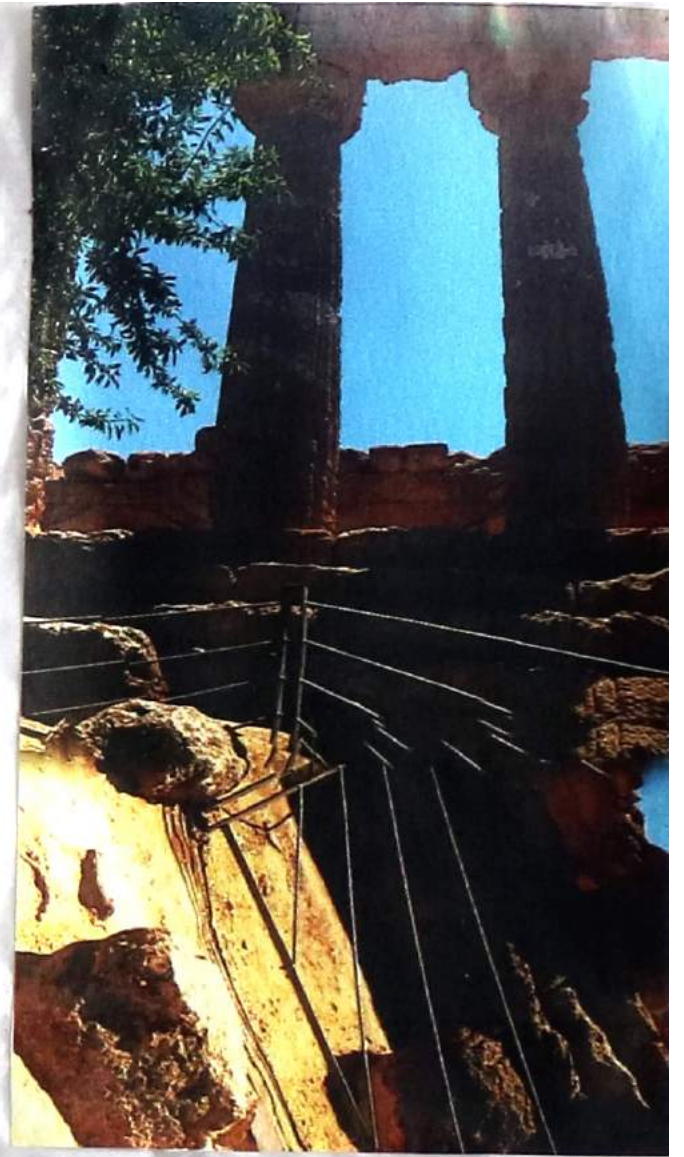
lo sguardo
che immagina
la vita

SIGHT, 2015

We are always on the move. Our eye sees the world in a different way from a traditional photo, which freezes an image as if we were static. We sometimes stop to watch, for example a work of art in a museum, but most of the time our eyes move without settling on anything.
I am researching how we look at our world. The theme are cities.

Agrugento, Sicilia 2017

Frankfurt Am Main, 2015
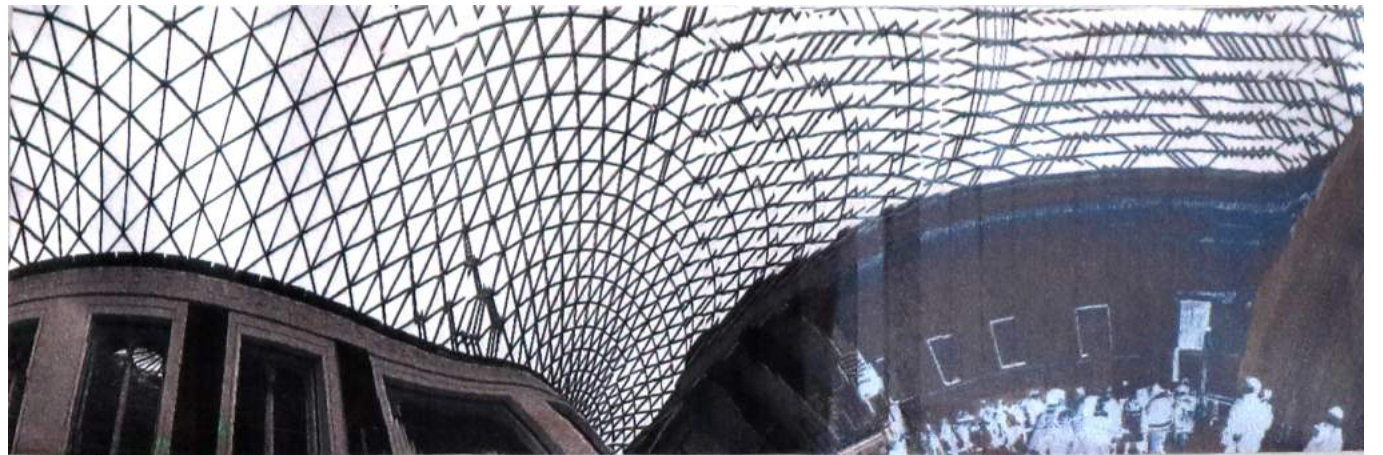
London, 2015

San Sebastian - Donostia, 2015

San Sebastian - Donostia, 2015

Noto Sicilia 2017

Barcelona, 2016
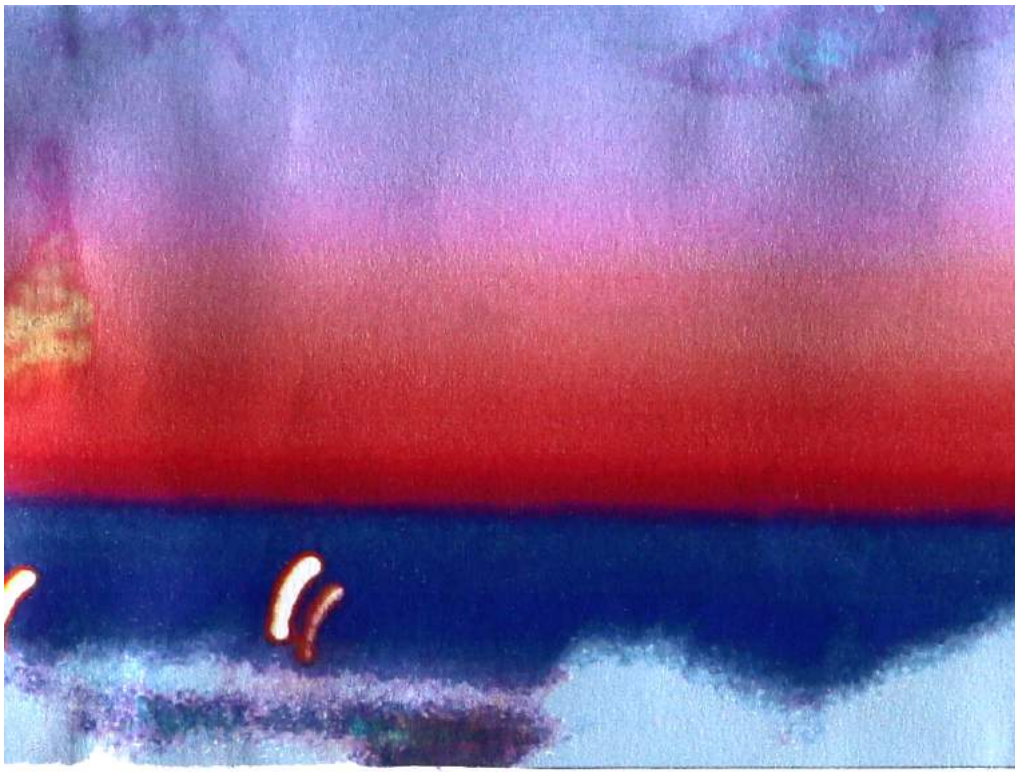
Copacabana, Rio de Janeiro, Brazil 2016

Scala dei Turchi, Sicilia, 2017

Silicon Valley, California, 2018
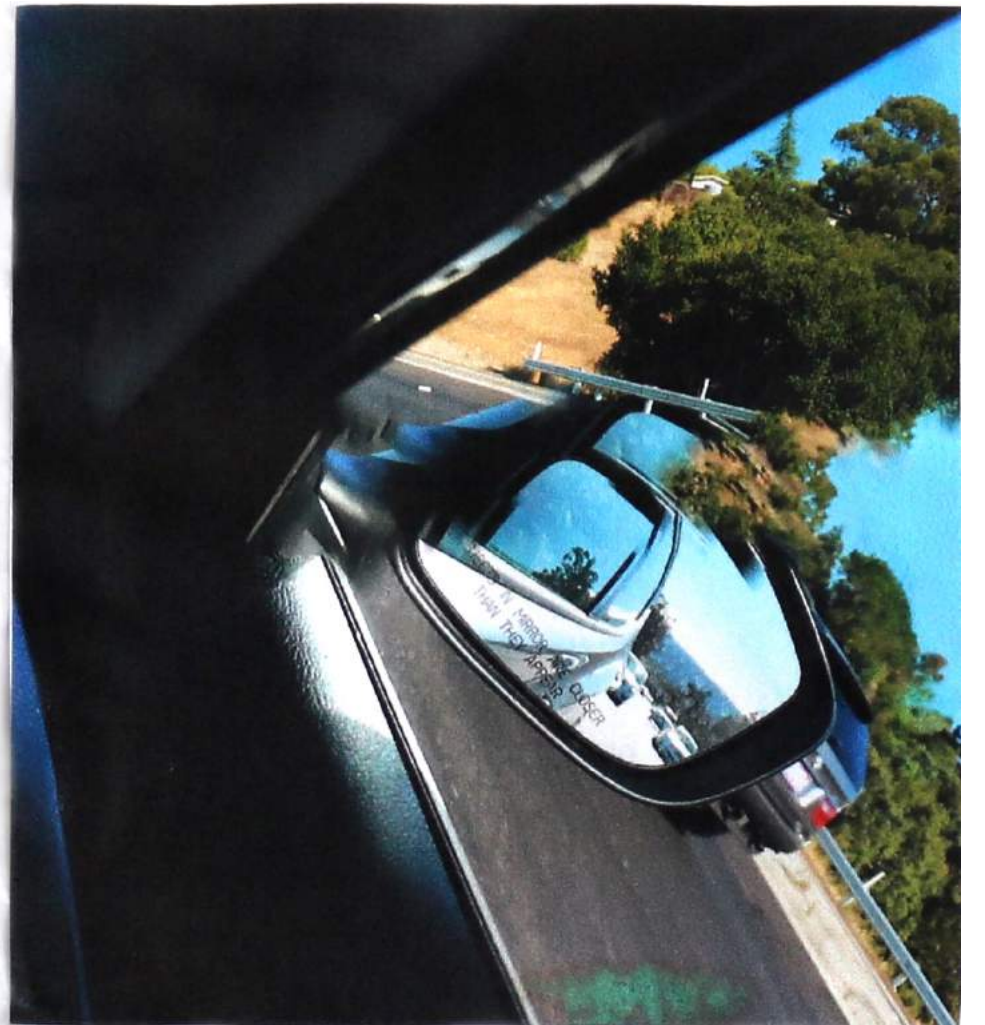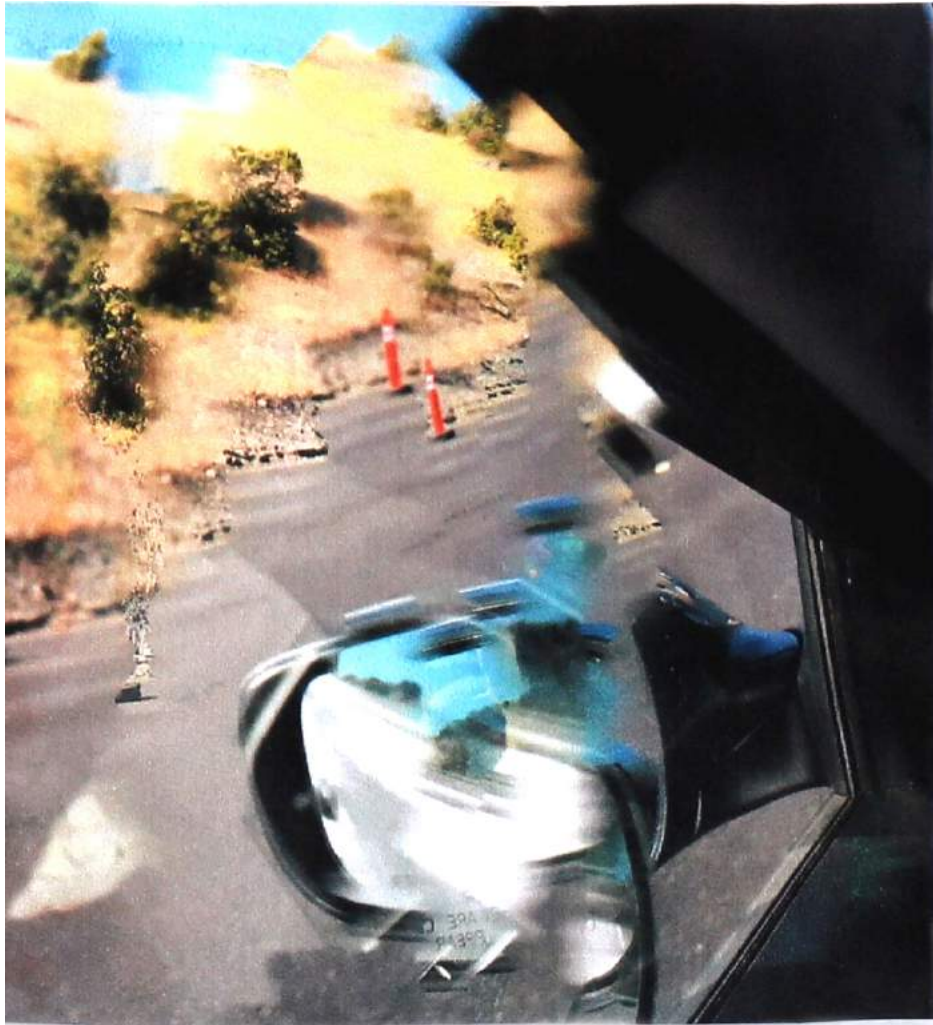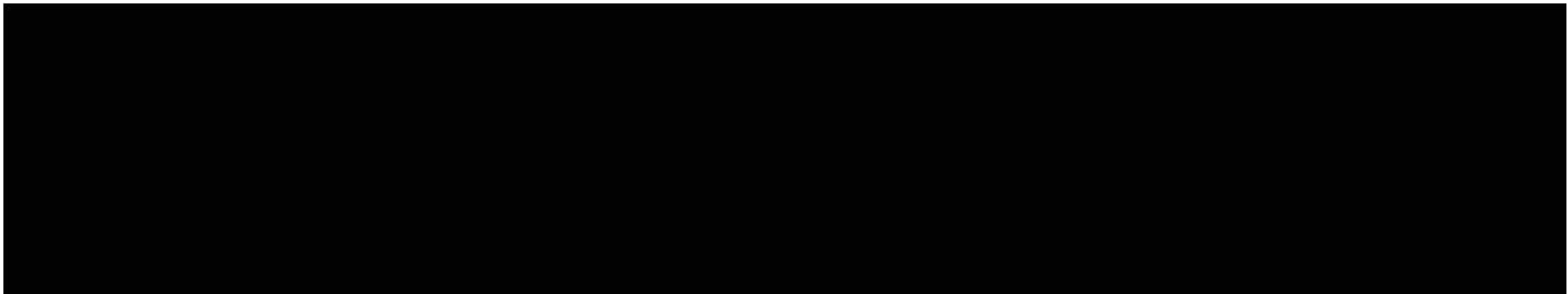
8   CHRONOLOGY

SYSTEMIC, CREATIVE, POETIC AND A PRESCRIPTION

PREAMBLE

My aim with this essay is basically to examine the syntactic-semantic approach that permeates and distinguishes Analivia Cordeiro's core poetics. Rather than scrutinize particular filigrees in one piece or another, I focus on apprehending vectors or threads running across her work and the conventional boundaries she has traversed or blurred over the last four decades.

For similar reasons, therefore, this account does not ignore Analivia's atypical and privileged background arising from the cultural context in which she was raised and interacted intensely until her father's premature death in 1973.

I shall also pursue herein some fundamental connections that Analivia posited between art, dance and digital technologies computer art, video, etc. . Lastly, I shall highlight Analivia's anthropological experience of observing the Kamayurá indigenous tribe, watching sorcery practices and routine productive processes interwoven into a continuous whole that, by extension, legitimized her own connecting the different elds of activity in which she has investigated *human movement*.

1973 2015

Early in the charting of her creative process over the last four decades especially for this book, Analivia poses two crucial points for the understanding of her oeuvre's core poetics. The rst point

relates to this same aspect of her investigation of *human movement* across all her activities artistic, choreographic, anthropological, technical and new media, pedagogical , and the other perhaps more signi cantly to the cultural background acquired from her family upbringing. In her own words:

All research conducted in my artistic career, as well as this book deal with the human movement in several areas, as a dancer for the stage, choreographer, video art, education systems, motion notation research, anthropological studies, body therapy. All these areas related to the understanding, knowledge and creation of human movement.

Initially, I would give the reader a sketch my training, which was done in two areas: visual arts and dance. from the text Brush Strokes above

Although Analivia did not explicitly set out to neutralize the speci c features of these individual elds of activity, she has focused on a wide-ranging common denominator: the necessary joint apprehension of her work disciplines that, when combined, con gure a single matter *human movement* spawned by these different fronts. In the second point she raised as a concluding statement, Analivia recognized the crucial content of her family's artistic and cultural background in two eminently creative elds: visual arts and dance. Interestingly, however, while placing emphasis on her training in these two elds, the artist fails to mention her architectural degree.

BACKGROUND AND POETIC UNIVERSE

Perhaps the college education was less decisive for Analivia than the informally cultivated learning absorbed from her father, Waldemar Cordeiro 1925-1973 , who played a key role in disseminating and consolidating Concrete art in Brazil as well as in discussions around visual art that fueled Brazil's avant-garde in the post-war period 1948-1960 . As the leading mentor for Concrete art in São Paulo and Brazil, Cordeiro's authority was supported by his theoretical mastery of theoretical and an outstanding discursive ability when addressing theoretical and intellectual issues of Concrete art a quality that set Waldemar Cordeiro apart from many other Brazilian artists emerging in the post-war period.

From early on, Analivia's familiarity with the development of her father's ideas and pursuits made her into a privileged observer of the critical issues then mobilizing not only the Concrete art movement but also other artists, poets and intellectuals all of them engaged in the revision of Brazilian and international modern culture in the postwar period, and the country's technological and industrial modernization. Of the everyday contact with her father's artistic ideas since her childhood days, Analivia recalls:

In long conversations we had, coordinated with readings, I learned to observe the artistic phenomenon according to an obj ective approach: the visual language has a syntax independent of a subj ective interpretation. in statement in Brush Strokes text above

Even before starting her own production, Analivia's family background had taught her that creative activity required more than talent and self-expression. Artistic production must primarily arise from communicative systems invented and structured by artists media as indispensable

regulating condition to channel their ow of creative and poetic invention[1].

An artist's training usually develops from enduring experiments with the directions, outcomes, procedural errors and accomplishments that drive their production, as well as the delineation of the fundamental poetic decisions materialized in their work.

An important point to note in this respect is that very few creative artists have had experiences comparable to Analivia's[2], which molded a consistent artistic self-consciousness based on her own family background and broader context , to the point that her affective-everyday experience of artistic creation took precedence and helped consolidate her actual poetic-experimental process.

SYNTAX AND SEMANTICS OF HUMAN MOVEMENT

Visual arts

The claim that artworks could be judged assessed or appreciated using objective parameters as posed by theories such as *pure visibility* in the work of Konrad Fiedler 1841-1895 was highly signi cant for Waldemar Cordeiro's ideas on Concrete art and his critique of artistic production conceived as expressing or illustrating an artist's subjectivity. Beauty could not be de ned by concepts, Fiedler argued in his aphorisms, whereas the value of an artwork could. A work of art might be dislikable and yet equally valuable. Aesthetic judgment did not require any preliminary cognition of its object, whereas artistic judgment was formed only through cognition. Everyone was capable of formulating an aesthetic judgment, which is inherent to Man, like consciousness. Very few people were able to judge art.

Although in uenced by Kant's ideas, Konrad Fiedler proposed a type of judgment in contrast to

the Kantian taste spontaneous and disinterested . His *artistic judgment* was based solely on recognizing the syntactic content of objective formal elements that con gured the visual-art grammars produced by artists, to be apprehended through the theory of pure visibility.

Initially proffered in the field of resonance of geometric-constructive abstraction, this idea spread and was transformed through formalist theories to extend to human creation in general and to inform poetic self-consciousness activated by the leading artists of 20th-century modernity.

Waldemar Cordeiro's theoretical preference for Fiedlerian *artistic judgment* was at the root of his advocacy of intelligent art   deductible from concepts   radically opposed to the notion of art as self-expression.

From this point of view, visual creation only possesses intelligible meaning when based on a system or *grammar* that enables us to observe the artistic phenomenon following an objective approach and understand that visual language has a syntax independent of subjective interpretation. Analivia Cordeiro critically assimilated this theoretical position/paternal practice as parameter for appreciating art and fundamental principle for visual art creative processes. Not surprisingly, therefore, she went on to pursue similar systemic foundations for dance, although quite unlike those her father posed for visual grammar.

Dance

At the age of seven, following therapeutic recommendations, Analivia started to study dance with Maria Duschenes 1922-2014 , a Hungarian who ed from war in Europe to settle in Brazil. The Cordeiro family's choice of instructor was certainly not due to analogies between her artistic principles and Waldemar Cordeiro's. Trained in England Dartington Hall under Rudolf von Laban 1879-1958 , one of the most in uential 20th-century theorists of human movement, Duschenes introduced the Laban system in Brazil and played a key role in the renewal of dance in this country.

During her rst year with Duschenes, Analivia preferred to observe guided improvisation sessions that usually ended their lessons, rather than take part in them.

 At the time, I had already acquired a very clear notion of composition and space, and I started to develop experimental ways of annotating choreography to help with rehearsals, since Dona Maria was forever forgetting sequences. I helped the group and at the same time shaped my understanding of the language of dance, not only from the point of view of dancers' bodies but composers too: the questions of space, distribution, composition itself, music, how dancers may be positioned and their differing individual skills. I looked at each person and the composition and thus gained an understanding of the whole.   from Brush Strokes text above

Analivia's need for understanding before acting' informs her production and reveals the mark left by an artistic background initially impregnated by concerns that energized Cordeiro's proposals for Concrete art. However, note that her preference for understanding before acting' should not be seen as subordination to her father's poetics or as a theoretical reductionism conditioning her experiences to a predetermined context.

There were unarguably processual transformations in Analivia's or Cordeiro's production that contradict the theoretical hypothesis. In both their cases, understanding before acting means delineating the different experimental fields in which they concentrated their poetic investigations in order to advance or redirect them in processual terms.

What an artist tells us explicitly is often contradicted by what he tells us implicitly, in the way he has constructed his work. A work of art, taken as the successful expression of a way of forming, can refer to the formal tendencies of an entire culture or an entire period, tendencies which, in turn, re ect analogous procedures in other elds such as science and philosophy from chapter 6 Form as Social Commitment , in *The Open Work I Umberto Eco*, translated by Anna Cancogn. Cambridge: HUP, 1989.

2 Her experience was similar to that of the artist Lenora de Barros, whose father Geraldo de Barros 1923-1998 was a member of Ruptura, the emblematic Concrete group from São Paulo, Brazil.

In Analivia's work, there is a confluence of the systemic content of Konrad Fiedler's theory of pure visibility underpinning her father's early Concrete experience with Rudolph Laban's *dance notation* method, which took basic structural principles of human movement as language inseparable from surrounding space.

However, note that systemic principles in the case of dance are different from those formulated by Concrete art and its proposal for an intelligent art guided by intellectual principles informing the actual visual-art creative context.

Unlike the latter, dance as the art of movement depends on the human body's strength and limits, as well as the space in which it moves. Dance notation requires primarily biological foundations rather than Concrete art's intellectual and visual ones. These principles may be seen in creative dance, notation, appreciation and education through movement, while also enabling the notion of dance to extend well beyond the strict boundaries of classical ballet choreography.

Computer video dance

The contemporaneous nature of Analivia's work does not arise from merely following the principles that prompted her early understanding of the artistic phenomenon following an objective approach ... and a syntax independent of subjective interpretation. Her contemporaneity arose primarily from her being first to connect the principles of Concrete art's planar spatiality from her father's painting of the 1950s and Laban's dance notation method Maria Duschenes to the electronic and computer visual media that she started using in 1973 to create choreography specifically designed for media propagation.

At 16, I started ballet classes ... I was soon invited to participate in works like the Structured Improvisation with the Clyde Morgan group. This work was a tremendous frustration because there was no dialogue between the shooting and what I was dancing. ... And I thought: wow There must be a way to a better dialogue between the camera and the movements.' I had the idea of doing this through computer planning. At the time, I often observed my father working with a computer. ... This way, computer dance for video was born. Brush Strokes text above

Some additional points on Analivia's *Computer video dance* project of the early 70s are in order: 1 It was the last stage in her education process influenced by the poetic experiments of her father, a pioneer of computer art in Brazil and Latin America, who died suddenly and prematurely in 1973 without having seen his daughter's first *Computer video dance* piece made under commission for São Paulo's TV Cultura; 2 *Computer video dance* differs essentially from televised conventional stage choreography in that it is designed to be watched only on video. 3 Films of conventional stage works were and still are merely images of works created for on-stage performances. They produce and therefore similarly to paintings preserve the radical distinction between original and reproduction; 4 It takes much longer to plan and film a ballet for video than to stage a presentation, so production costs are extremely high compared with the results obtained; 5 On the other hand, outreach costs involved in circulating computer video dance works are very low compared with the cost of having a dance company tour different venues; 6 In conclusion, it is fundamentally important to note that these works evince a semantic inflection resulting from geometrization and, at times, mechanization of the bodily movements of Analivia and other dancers. These characteristics may be viewed as a subtle poetic-critical indication of contemporary urban individual's contamination by the mechani-

cism inherent in the modus operandi of industry and technology.

Analivia's precocious critical mastery and awareness of the above-mentioned subjects at the age of 19 made her the absolute pioneer of computer video dance in Brazil and one of the world's rst creators of electronic dance. In the same way, her technological experiments ranked her among the forerunners of video art in Brazil.

Anthropological experience

In 1975, Analivia decided to study the body language of Brazilian native Indians to deepen her knowledge of human movement. Her researching led to a stay with a Kamaiurá tribe, in the Upper Xing River region, during their Kwarup, a ritual festive event. Having submitted her project to the University of São Paulo, she subsequently shot Super-8 lm and photos together with her thesis on body language to be presented to the university on her return. Her research material was in storage for 39 years until 2013, when it was restored to be shown at São Paulo's Museu Brasileiro da Escultura, the following year.

On the invisible but permanent signi cance of this experience for her life and later work, she recently said:

Living for a few months in a preserved Indian village … in which only three individuals spoke a few words of Portuguese was an unforgettable experience for me … Far from an intellectual experience about which I could write extensively, that was a sensory immersion. I had the opportunity to meet a group of people who actually knew what harmony was, who really knew what respect was about, who really knew how to listen, observe, wait for their turn to speak up, and be concerned with making themselves understood. Manuara exhibition catalogue

Contact with traditional communities involves difficulty in comprehension for the modern urban individual. The fragmentation of our everyday life into very different activities affective, working, religious, cognitive, existential, social, community etc... does not exist in these cultures. Their tribal living contrasts with the permanently sectioned urban dynamics of capitalist division of specialized labor, continuously rejoined by unity of subject and individual.

Analivia's time with the Kamaiurá was more a sensory experience than an intellectual one. Although the visit arose from cognitive curiosity as a researcher into human movement, the exposure to tribal life captivated her due to the depth and intensity of this different kind of social organization. She saw her research project through to conclusion but its strictly academic ndings remained in hibernation for almost four decades.

Conversely, the integrity of Analivia Cordeiro's lived experience has gradually developed into ethical and affective reference for her life and work, since it led to new correlations between plan and chance, intellect and sensibility, totality and fragment.

EDUCATION, PRIZES AND SCHOLARSHIPS

1954 Born in São Paulo, Brazil. Daughter of Waldemar Cordeiro and Helena Kohn Cordeiro.

1972/1976 Architecture and Urbanism College at University of São Paulo, Brazil.

1962/1972
Laban Art of Movement with Maria Duchenes, São Paulo, Brazil.

1967 Prize Art for Youngs, O Estado de São Paulo newspaper, Brazil.

1967 distinguished work at Contemporary Art Museum of University of São Paulo, Brazil.

1974 Prize for M3x3 Contemporary Art Museum of University of São Paulo, Brazil.

1975 S-8 shooting of Kwar p ritual at Kamaiurá tribe, National Park of Xing . Edition sponsored by São Paulo Research Foundation - FAPESP, Brazil.

1977/1978 classes at Merce Cunningham Dance Studio, NY, USA.

1977 classes at Louis-Nikolais Dance Theatre Lab, NY, USA.

1978 Viola Farber classes, NY, USA.

1978 Janette Stoner classes, NY, USA.

1978 Gus Solomons Jr. classes, NY, USA.

1983 Scholarship of CNP to research about Trajectory-Notation at University of São Paulo.

1986 member of Brazilian Plastic Artists, Armando lvares Penteado Foundation - FAAP, Brazil.

1993 marry Nilton Lobo and gives birth to Thomas Cordeiro Guedes

1994/96 São Paulo Research Foundation - FAPESP masters scholarship, Brazil.

1996 master thesis Nota-Anna   an electronical notation of body movements based on Laban method, master thesis advisor Nelly de Camargo, Art Institute of State University of Campinas - UNICAMP, Brazil.

1999/2001 Eutony professional course, São Paulo, Brazil.

2000/04 São Paulo Research Foundation - FAPESP PhD scholarship, Brazil.

2004 PhD dissertation Looking for Cyber-Harmony: a dialogue between body awareness and electronic media, doctor dissertation advisor Arlindo Machado,

Semiotic and Communication Department of Catholic University of São Paulo - PUC-SP, Brazil.

2010 post-doctorate dissertation Joy of Reading at Federal University of Rio de Janeiro, Brazil.

2015 BEEP award of Electronic Art, ARCO Art Fair, Madrid, Spain.

2018 member of International Dance Council CIF of UNESCO

2019 post-doctorate thesis The Architecture of Movement, University of São Paulo, Brazil.

1969 choreography and performance at Arts Week, Contemporary Museum of Campinas, Brazil.

1970 dancer in Maria Duschenes Dance Company at 1rst International Congress of Therapy and 5th Psychodram and Sociodram Congress and Museum of Art of São Paulo, Brazil.

1972 dancer in Structured Improvisation under direction of Clyde Morgan at TV Cultura of São Paulo, Brazil.

1973 M3x3 at Interact Man: Machine: Society, International Festival of Edinburgh, Scotland.

1973 Multienvironment, choosen to represent the Architecture and Urbanism College of University of São Paulo at 1st Bienal of Architecture, São Paulo, Brazil.

1973 M3x3 at Jovem Arte Contemporanea, Contemporary Art Museum of University of São Paulo - MAC-USP, Brazil.

1974 M3x3 at Arte de Sistemas in Latin America, International Cultureel Centrum, Antwerp.

1974 M3x3 at Latin American Films and Video Tapes, Media Study of State University of NY, Buffalo, USA.

1974 M3x3 and 0° — 45° at Latin America 74, Institute of Contemporary Arts, London, England.

1974 M3x3 at Festival Experimental, Center of Arte and Comunication - CAYC, Buenos Aires, Argentina.

1974 M3x3 and 0° — 45° at The Bat-Sheva Seminar on Interaction of Art and Science, Jerusalém, Israel.

1975 M3x3 and 0° — 45° at Latin America 74, Espace Cardin, Paris, France.

1975 M3x3, Gestures and 0° — 45°, Goethe Institute, São Paulo, Brazil.

1975 M3x3 and 0° — 45° at Galleria Civica D'Arte Moderna, Ferrara, Italy.

1975 M3x3 and 0° — 45° at International Conference Computer & Humanities/2, University of Southern California, Los Angeles, USA.

1976 M3x3, Gestures and 0° — 45° at 20th American Dance Guild Conference presented by Jeanne Beaman, Massachussets Institute of Technology, Cambridge, USA.

1976 M3x3, Gestures and 0° — 45°, TV public station - WGBH, Boston, USA.

1977 M3x3 and Cambiantes, Galpão Theater, São Paulo, Brazil.

1978 Videodance Workshop under direction of Merce Cunningham and Charles Atlas, Merce Cunningham Dance Studio, NY, USA.

1978 dancer at Janette Stoner Dance Company, Carl Schurlz Park Hockey Field, NY, USA.

1978 dancer at Street - Performances - Rits & Runs II under direction of Gus Solomons Jr., NY, USA.

1978 Cambiantes at Art of Space Era, Von Braun Civic Center of Huntsville Museum of Art, Alabama, USA.

1979 dancer in the choreography Call at III Contemporary Dance Competition, Federal University of Bahia and at I Contemporary Dance Show, Brazilian Comedy Theater, São Paulo, Brazil.
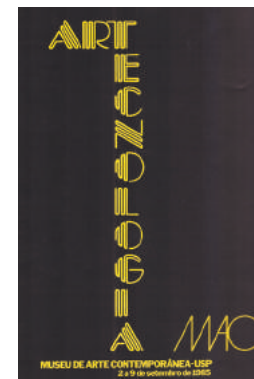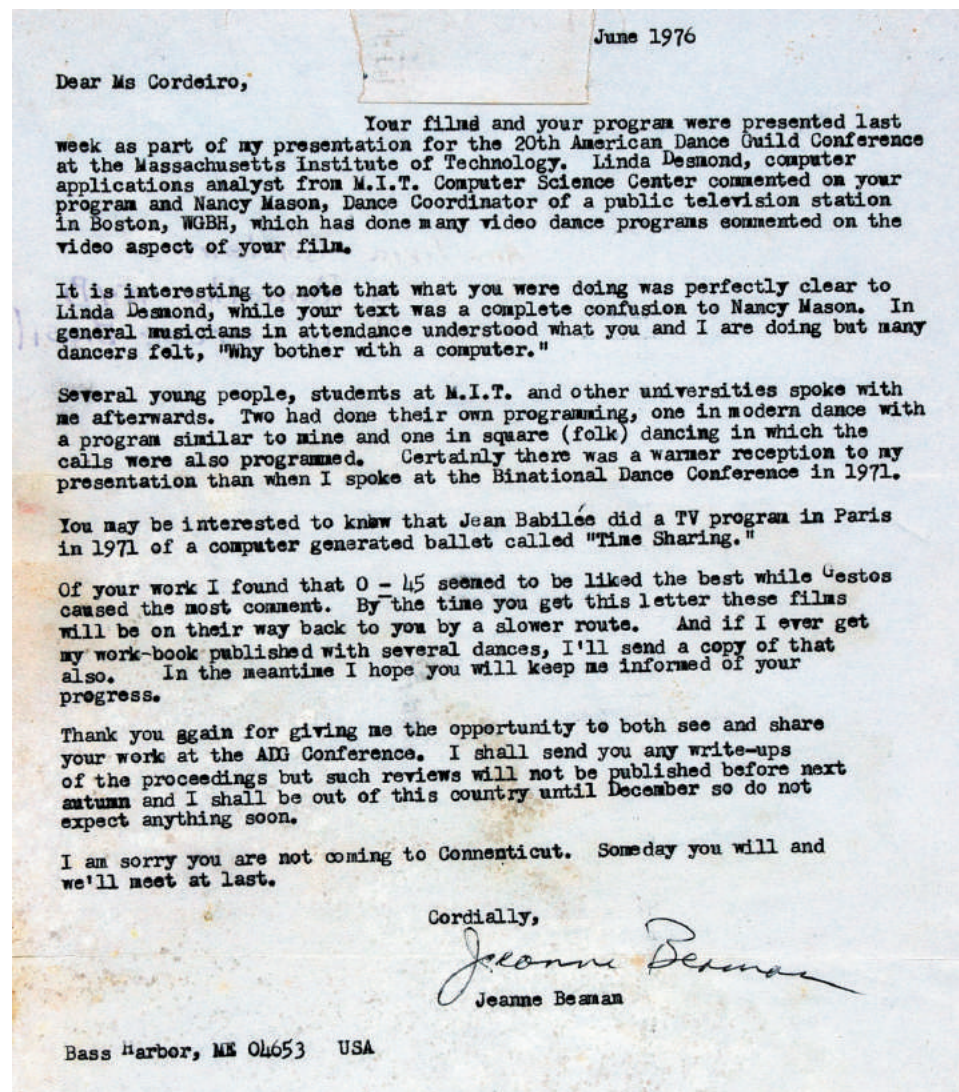
1979 performance at Popular Art Movement, São Miguel Paulista, Brazil.

1980 coreography, direction and dancer in Naturality with Analivia & Company, Galpão Theater, São Paulo, Brazil.

1983 Cambiantes and M3x3 at I Exhibition of Computer Art, SUCESU-SP, Informática 83, São Paulo, Brazil.

1984 Cambiantes at Informática 84, Rio de Janeiro, Brazil.

1985 Ar, co-author Takashi Fukushima at Art Tecnology, Contemporary Art Museum of University of São Paulo - MAC-USP, Brazil.

June 1976

Dear Ms Cordeiro,

Your films and your program were presented last week as part of my presentation for the 20th American Dance Guild Conference at the Massachussetts Institute of Technology. Linda Desmond, computer applications analyst from M.I.T. Computer Science Center commented on your program and Nancy Mason, Dance Coordinator of a public television station in Boston, WGBH, which has done many video dance programs commented on the video aspect of your film.

It is interesting to note that what you were doing was perfectly clear to Linda Desmond, while your text was a complete confusion to Nancy Mason. In general musicians in attendance understood what you and I are doing but many dancers felt, "Why bother with a computer."

Several young people, students at M.I.T. and other universities spoke with me afterwards. Two had done their own programming, one in modern dance with a program similar to mine and one in square (folk) dancing in which the calls were also programmed. Certainly there was a warmer reception to my presentation than when I spoke at the Binational Dance Conference in 1971.

You may be interested to know that Jean Babilée did a TV program in Paris in 1971 of a computer generated ballet called "Time Sharing."

Of your work I found that 0 - 45 seemed to be liked the best while Gestos caused the most comment. By the time you get this letter these films will be on their way back to you by a slower route. And if I ever get my work-book published with several dances, I'll send a copy of that also. In the meantime I hope you will keep me informed of your progress.

Thank you again for giving me the opportunity to both see and share your work at the ADG Conference. I shall send you any write-ups of the proceedings but such reviews will not be published before next autumn and I shall be out of this country until December so do not expect anything soon.

I am sorry you are not coming to Connenticut. Someday you will and we'll meet at last.

Cordially,

Jeanne Beaman

Bass Harbor, ME 04653 USA

1985 0° — 45° at Multimedia, Armando lvares Penteado Foundation - FAAP, São Paulo, Brazil.

1987 Slow-Scan transmission of the choreography Slow Billie Scan together with Lali Krotozynski and IPAT Group, from the Sound and Image Museum - MIS to the Dax Group, Carnegie Mellon University, Pittsburgh, USA.

1985 performance 0° — 45° at Brazil'70/80 new media/multimedia, Armando lvares Penteado Foundation - FAAP, Brazil.

1988 Cambiantes at VideoDance, Carlton Dance Festival, São Paulo, Brazil.

1988 performance and choreography of VideoVivo, author Otavio Donasci, Contemporary Art Museum of University of São Paulo - MAC USP and at 1st International Show of Scienti c Image, Science Station, São Paulo, Brazil.

1989 Dança Criança, Slow Billie Scan and 0° — 45°, at Carlton Dance Festival, São Paulo/Rio de Janeiro, Brazil.

1989 performance na exposição Mágico Espaço Seu Corpo na Miriam Mamber Artwear & Design , São Paulo, Brazil.

1989 photographic model at Liana Bloisi Wearable Art, São Paulo, Brazil.

1992 direction and dancer at Tableaux with the Micron Virtues Company, São Paulo Cultural Center, Brazil.

1994 direction of Games, choreography of Hagoromo the feather cloak, transcription of Zeami play 1363-1443 by Haroldo de Campos, direction performance Alice K, São Paulo Cultural Center, Brazil.

1996 performance 0° — 45° with Percusion Group of UNESP at opening and videos and M3x3, 0° — 45°, Cambiantes and Trajetória videos at 4th Studio of Image Technology, UNESP/ SESC/SENAI, Brazil.

1997 performances Striptease and 0° — 45° at Mediations, ItauCultural Institute, São Paulo, Brazil.

1997 M3x3, 0° — 45°, Cambiantes, Trace-forms, Striptease videos and Striptease 0° — 45° performances at Precursor and Pioneers of Art&Technology, Paço das Artes, Brazil.
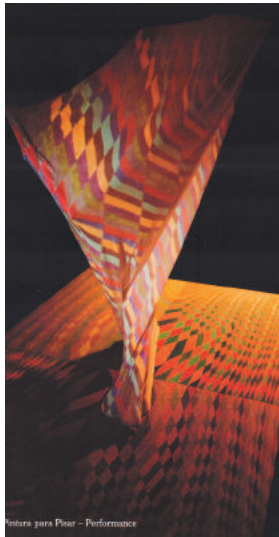
1998 Striptease at 27th Annual Dance on Camera, Lincoln Center, NY, USA

1999 Laban's Concepts of Movement, 0° — 45°, Slow Billie Scan and Striptease at IX Festival Internazionale de Videodanza Il Coreografo Elettronico, Institut Français de Naples, Italy

2001 performance at Paintings to Step by Aldir Mendes de Souza with Gícia Amorim, Pinacoteca of São Paulo, Brazil.

2003 M3x3 at Subvertion of Media, ItauCultural Institute, São Paulo, Brazil.

2003/2005 M3x3 at Made in Brazil, ItauCultural Institute, São Paulo, Brazil.

2005 M3x3, 0° — 45°, Cambiantes, Ar, Slow Billie Scan, Striptease and Carne I at Audiovisual of Dança em Pauta Show, Banco of Brazil Cultural Center, SP.

2005 DJMobile co-author Nilton Lobo at Life Goes Mobile, NokiaTrends, São Paulo, Brazil.

2005 Ex-Image co-author Nilton Lobo at Life Goes Mobile, NokiaTrends, Rio de Janeiro, Brazil.

2006 Carne I / II Focus on Dance, International Festival of Videodance, Rio de Janeiro, Brazil.

2007 E/OU at Perspective of Video Creations in Brazil, Banco of Brazil Cultural Center, Brasília, Brazil.

2007 Carne I / II at 6. Film Show, Banco of Brazil Cultural Center, Rio de Janeiro, Brazil.

2007 CarneI/II at Subjetivities, ItauCultural Institute, Brazil.

2007 E/OU at 21 Paulista Audio Visual Show, Brazil.

2007 Unsquare Dance using software X-Motion e Choreogra sm by Luiz Velho, Pure and Applied Mathematics Institute - IMPA, Rio de Janeiro, Brazil.

2008 Unsquare Dance choreography at SIGGRAPH, USA.

2008 Unsquare Dance choreography at SIGRAPI, Cuiabá, Brazil.

2008 Unsquare Dance choreography at Art7, National Museum, Brasília, Brazil.

2009 improvisations Angles and From Skin to Space at Musicircus, Bienal Mercosul, Brazil.

2009 Prepared Body at RadioVisual, Bienal Mercosul, Brazil.

2010 Carne II/III at Liberty is not Enough. The desire has no Name, Rio de Janeiro, Brazil.

2009 M3x3 and Joy of Reading, Luciana Brito Gallery, Brazil.

2010 M3x3 at 1969-1974, Museum of Contemporary Art of University of São Paulo MAC USP, Brazil.
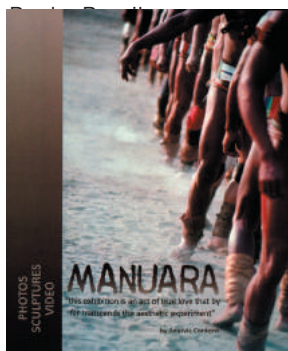

2013 images of Flesh I at Fragmented Geometry, Contempo Gallery, São Paulo, Brazil.

2013 M3x3 installation, Anita Beckers Galerie, SP-Arte, SP, Brazil.

2014 Manuara at Brazilian Museum of Sculpture -MUBE, São

2014 co-curator together with Fernando Cocchiarale and Arlindo Machado of the exhibition Waldemar Cordeiro   Fantasia Exata at Paço Imperial, Rio de Janeiro, Brazil.

2015 M3x3 installation, 0° — 45°, documents and Cambiantes sculpture at Anita Beckers, ARCO Art Fair, Madrid, Spain.

2015 M3x3 installation, M 3x3 creation documents at Moving Image Contours: Points for a Surrounding Movement, Tabakalera, San Sebastián-Donostia, Spain.

2015 M3x3 installation at Expanded Senses. Frankfurt, Germany.
2015 Bienal Mercosul, Porto Alegre, Brazil.

2016   M3x3 installation at The End of The World exhibition, Centro Pecci, Italy.

2017   M3x3 and Cambiantes at Radical Women exhibition, Hammer Museum, Los Angeles, USA. **2018** at Brooklyn Museum, New York; and Pinacoteca, São Paulo, Brasil.

2017   M3x3 at Videos in LatinAmerica exhibition, Laxart, Los Angeles, USA.

Anita Beckers and Analivia in Frankfurt, 2015.

2017 M3x3 at Anita Beckers Galerie booth, LOOP Festival, Barcelona, Spain

2018 M3x3 Installation at Algoritmos Suaves exhibition, Comunitat deiMusei de Valencia, Valencia, Espanha.

2018 individual exhibition unforgetable Kicks at Museu de Arte Moderna, Rio de Janeiro, Brasil.**2019** at UNIBES cultural, São Paulo, Brasil.

2018 Coder Le Monde, Centre Pompidou, Paris, France

2018 Chance and Control, Victoria&Albert Museum, London, England.

2018 35. Film Interntional Festival Jerusalem, Israel.

2019   M3x3 installation at Faces exhibition, Es Baluard Museu dArt Modern I Contemporani de Palma, Spain.

2019   M3x3 at El Giro Notacional exhibition, Museo de Arte Contemporáneo de Castilla y León, Spain.

2019   SP-Arte, Masters section, Galeria Isabel Aninat booth, SP, Brasil.

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LECTURES, WORKSHOPS AND PUBLICATIONS

1973 lecture A Dance Language Research, Armando lvares Penteado Foundation - FAAP, Brazil.

1974 paperback Computer Dance TV TV/Dance at The Bat Sheva de Rotschild Seminar on Interaction of Art and Science, Jerusalem, Israel.

1975 M3x3 included in the learning program of Bezalel Academy of Arts, Jerusalem, Israel.

1975 guest lecture with the paperback Computer Dance TV TV/Dance introduced by Grace Hertlein at International Conference on Computers & Humanities/2, Los Angeles, USA.

1975 article about Brazilian art by Pierre Restany, Domus magazine, Italy/ France.

neare il ruolo di Walter Zanini, diret-tore del Museo d'Arte contempora-nea dell'Università di Saõ Paulo, che riesce a conciliare le esigenze e le illusioni di due generazioni alla volta. Alloggiato per il momento in uno spazio appena sufficiente nel Palazzo della Biennale a Ibiraquera, il Museo godrà in futuro d'uno spa-zio assai più flessibile nel cuore della Città Universitaria.

Questa inquietudine, che si aggiun-ge a un interesse profondo per la ricerca condotta dai giovani, mi è sembrata sintomatica di una presa di coscienza, in ogni caso. Questi artisti, più o meno legati ai circuiti tradizionali, sono sensibili alla criti-ca radicale dell'arte in sè. Se si vuole sfuggire al circuito che è il loro, vale a dire al circuito della produzione e della diffusione d'ope-re d'arte/valori di mercato, bisogna trovare una risposta alla domanda: « l'arte, perché? ». E questa doman-da sbocca direttamente ed inevita-bilmente su una ricerca di linguag-gio basata sulla metodologia delle scienze umane. È il solo strumento di cui dispongono i giovani artisti per tentare di ritrovare un nuovo le-game personale tra l'arte e la socie-tà. Alla domanda: « l'arte, perché? » rispondono: « l'arte, perché no? ». Alla sociologia dell'arte rispondono con una *arte sociologica*: nuove proposizioni psicosensoriali, semio-tiche, antropologiche. Lo struttura-lismo linguistico offre loro un me-todo di analisi dei sistemi di lin-guaggio. Ed era precisamente la versione francese di questo genere di ricerca che io ero venuto a pre-sentar loro, sotto gli auspici della Ambasciata di Francia a Brasilia e dei servizi culturali del Consolato Generale di Rio. Penso che questo genere di informazione sia stato ben accolto da coloro cui era diretto, va-le a dire dal gruppo limitato di artisti brasiliani interessati a una riflessio-ne concettuale e sociologica di que-

stematica che è stata ripresa dalla di lui figlia nel campo della danza. Analivia Cordeiro è l'*enfant prodige* della « computer dance »: a 21 anni gira il mondo per presentare i suoi spettacoli, i suoi film, la sua teoria dell'espressione corporale program-mata.

La programmazione sistematica si fonda sulla memoria del computer e la sua strutturazione sulla nozione di semplificazione, di discriminazio-ne e di scelta: si tratta di un ritorno all'essenza della natura umana, alle sue motivazioni primarie.

L'atteggiamento di Wesley Duke Lee è curiosamente parallelo. Uscito dal « realismo magico » questo artista di Saõ Paulo realizza da qualche anno delle strutture d'ambiente fon-date sulla tecnologia avanzata e sul-l'elettronica: il suo « Helicoptero » di 4 metri di diametro è un ambiente circolare interamente auto-program-mato.

Questa stessa serenità la si ritrova presso Franz Krajcberg, il cantore e il demiurgo dell'ecologia tropica-le, quando è nel suo ambiente. Krajcberg è noto per le sue sculture arborescenti, che sono dei fram-menti, scelti ed assemblati, di rami, di tronchi e di radici aeree raccolti *in situ*, nel cuore della foresta ver-gine. Io ho seguito le sue ricerche per quindici giorni, nei suoi diversi luoghi di « lavoro »: il Minas Gerais con le sue terre ferruginose, Nova Viçosa a sud di Bahia, con gli al-beri del mango e le spiagge del-l'Atlantico (Isla dos Coqueiros) dove la bassa marea lascia scritti sulla sabbia dei disegni metamorfici di cui l'artista prende il calco dal vivo; la Piaui, infine, riserva infinita di paesaggi rupestri, sahariani, extra-temporali.

A livello dell'alternativa tecnologia/ natura, il Brasile costituisce un im-menso capitale di energia inventiva. Il simbolo di questa virtualità otti-mistica, all'inverso e contro tutto, è
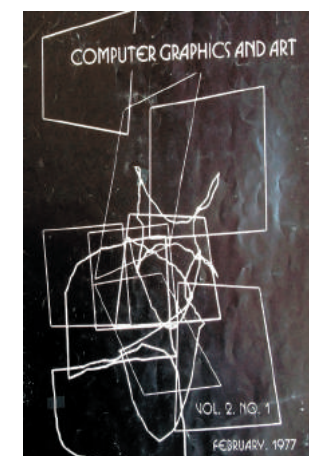
domus 544 marzo 1975

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1976 Review by Martin J. Tracy, USA.

1976 Article The Programming Coreographer at Dados e Idéias magazine no. 4, Rio de Janeiro, Brazil.

1977 article The Programming Coreographer at Computer Graphics & Arts, February, California, USA.

The Computer in Choreography

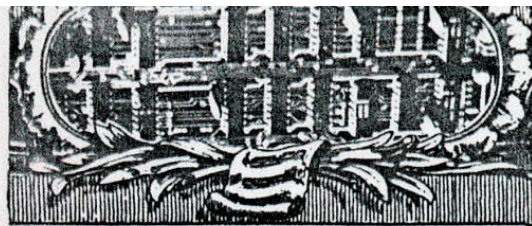**John Lansdown**
System Simulation Ltd.

Although readers of this journal will be aware that few areas of endeavor are untouched by the impact of the computer, it will surely come as a surprise to many that even ballet, perhaps the most human of all arts, is being influenced by computing techniques and concepts.

In dance the human body is the instrument the choreographer plays upon (with the active cooperation of the dancer) to create scenes of the figure in motion over time. There is in dance the creativeness of the choreographer in devising interesting, or exciting, movements; there is the creativeness of the dancer in achieving these movements that sometimes even overshadow the original creation.

My question to myself ten years ago was, is there a place for the computer in this intensely creative, intimately personal art? I was familiar with some of the attempts to utilize the computer to compose poetry or prose, to produce kinetic sculpture, or to create music. I tried to draw common principles from these efforts to apply to ballet.

My first experiments with computer-generated dance produced sequences that were pleasing to both dancers and viewers, but they provided for too little human participation, while running up computer time charges beyond my means. Later experiments, as you will see, struck what I felt to be a better balance between human and computer participation.

Background

As far back as 1964, Jeanne Beaman and Paul Le Vasseur at the University of Pittsburgh used computers to generate simple sets of instructions to be performed by solo dancers.[1] In 1966, Michael Noll produced a computer-animated film showing primitive stick-figures moving about a stage to programmed choreographic instructions.[2] More recently Brazilian choreographer Analivia Cordiero has used programs to generate dances and their television coverage.[3,4] A great deal of work, however, is aimed not at creating dances but at assisting choreographers and others in visualizing body movements.

During the late 1960's Israeli choreographer Noa Eshkol and others at the University of Illinois worked on computer-assisted movement notation and produced programs which allowed a choreographer to see a machine-plotted representation of the movement paths of limbs.[5] At about the same time, Carol Withrow at the University of Utah devised programs to describe limited movements of a stick-figure by relating angular displacements of limbs to curves drawn on a graphic display.[6]

Currently, there is a great deal of work on computer interpretation of dance notation—notably in one scheme known as "Labanotation." Zella Wolofsky at Simon Fraser University wrote a program to output stick-figure interpretations of Labanotation commands,[7] and this work has been enhanced and developed by Barenholtz and others.[8] Smoliar, Weber, and Brown at the University of Pennsylvania have described work for the interactive editing of Labanotated scores.[9,10] Janette Keen at the University of Sydney has developed a high-level computer language compatible with Labanotation and suitable for the graphic display of movement.[11] Savage and Officer at the University of Waterloo have devised an interactive system

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1983/1987 director and teacher of Analivia Dance School, São Paulo, Brazil.

1984 lecture Trajectory-Notation Research at XVII National Congress of Computing, Rio de Janeiro, Brazil.

1988 The Programming Coreographer in the catalogue of Brazil'70/80-Art/New Media/Multimedia, Brazil.

1989 Laban Method of Movement Analysis course, Psychology Institute of University of São Paulo, Brazil.

1990 paperback and Laban Method course at Scene Arts School of University of São Paulo, with Cybele Cavalcanti and Claudia Homburguer, Brazil.

1996/1997 Laban Theory classes at Jung Psycotherapy with Focus on the Physio-Psyche Integration course, Sedes Sapientae Institute, São Paulo, Brazil.

1995/97 Body Analysis at Fashion School of Santa Marcelina University, Brazil.

l998 lecture Representation Aspects, Industrial Design School - ESDI, Rio de Janeiro, Brazil.

1998 workshop A Dialogue Between Senso-Perception and Arti cial Languages in Body Language Universe, Paço das Artes, São Paulo, Brazil.

1998 video/book Nota-Anna an electronical notation of body movements based on Laban method, Annablume and São Paulo Research Foundation -FAPESP publishers, Brazil.
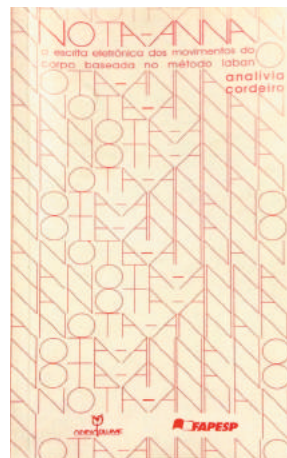
1999 lecture Nota-Anna at Body Dramaturgy: Laban, Goethe Institute, Brazil.

1999 lecture Nota-Anna at Invenção: Thinking the Next Milenium, ItauCultural Institute, Brazil.

1999 workshop and lecture at The 1999-2000 Sawyer Seminar, University of Chicago, USA.

1999 lecture/practical demonstration at L'Ombra dei Maestri Rudolf Laban: gli spazi della danza, Universit degli Studi di Bologna, Italy.

2001 lecture Analysis of Human Motion Using Java Technology, JavaOne Conference, Sun's 2001 Worldwide Java Developer Conference, with Nilton Lobo, San Francisco, USA.

2001 creation of the Waldemar Cordeiro CD-Rom, Galeria Brito Cimino, Brazil.
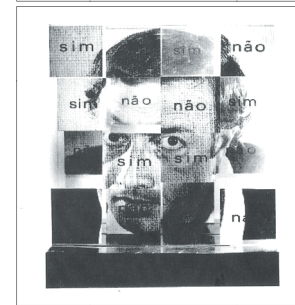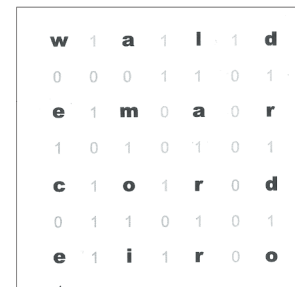
2002 workshop at II International Symposium of Dance in Wheel Chairs, State University of Campinas - UNICAMP, Brazil.

2002 workshop The In uence of the Sight in the Bone Alignment, 3rd Brazilian Journey of Eutony, Brazil.

2003 lecture Real Time Motion Capture Using Java Technology at JavaOne Conference, Sun's 2003 Worldwide Java Developer Conference, with Nilton Lobo, San Francisco, USA.

2004 workshop Looking fot Cyber-Harmony a Dialogue Between the Body Awareness and Electronic Media at Cinético-Digital, ItauCultural Institute, Brazil.

2006 lecture Pocket Art Video Show, Jewish Cultural Center, Brazil.

2006 article Dance of the Machine, the Body and the Mind, FAPESP Magazine, December, Brazil.

2007 lecture Body and Arts, course Products in Process: the Gesture in Arts, Architecture and Urbanism College of University of São Paulo, Brazil.

2009 lecture Body Language and Technology, International Congress 7.ART, University of Brasília - UnB, Brazil.

2009 article Feet and Health, Em Cotia magazine, Brazil.

2012 lecture Waldemar Cordeiro to the monitors, XXX Bienal de São Paulo, Brazil.

2013 Acquisition of M3x3 single channel and M3x3 installation by the Museum fur Konkrete Kunst, Ingolstadt, Germany.

2014 editor of the book Waldemar Cordeiro Fantasia Exata, ItauCultural, Brazil.

2015 lecture Manuara at Indians of Brazil Seminar Life, Culture and Death, Guita e José Mindlin Library, University of São Paulo, Brazil.

2015 panel Thinking and Writing Movement Technology Revealing a Hidden Feature of Human Expression, B3 Moving In Biennale, Frankfurt, Germany.

2015 Workshop and lecture Movement Notation from Computer Dance to Nota-Anna, Tabakalera, San Sebastián-Donostia, Spain.

2015 Workshop and lecture Movement Notation from Computer Dance to Nota-Anna, Bienal do Mercosul, Porto Alegre, Brazil.

2016 workshop Movement Notation from Computer Dance to Nota-Anna, Centro Pecci, Prato, Italy.

2017 workshop Wellness, Therapy and Technology, Centro Pecci, Italy.

2017 workshop Notación del Movimiento Humano, Museu D Art Contemporani de Barcelona, Spain.

2017 workshop at Festival LOOP, Barcelona, Spain.

MUSEUM COLLECTIONS

Museu de Arte Contemporanea da Universidade de São Paulo - MAC USP, Brasil

Museo Reina Sofia, Madrid, Spain

Oskar Schlemmer Archives, Switzerland

Museum f r Konkrete Kunst, Ingolstadt/ Germany

BEEP Coleción de Arte Electronica, Spain

Victoria&Albert Museum, London, England

Museum of Modern Art MoMANew York

VIDEO CREDITS

0°↔45° version I with interview, 4min26sec,
black&white, Brazil 1974
Performers: Analivia Cordeiro
Music: Fox Trot by William Russell conducted by John Cage
Production: Computer Center of State University of
Campinas   UNICAMP, TV Cultura de São Paulo

0°↔45° version III, 1min59sec, color, Brazil, 1974/1989
Performers: Analivia Cordeiro
Music: Fox Trot by William Russell conducted by John Cage
Edition: Analivia Cordeiro, Renato L. Pahim
Production: Gil Ribeiro, Sinc Video

Air, 5min59sec, color, Brazil 1985
Performers: Analivia Cordeiro
Scene Designer: Takashi Fukushima
Music: air on G string by Johann Sebastian Bach
Edition: Analivia Cordeiro
Production: Analivia Cordeiro

Architecture of Movement, 1min20sec, color,
Brazil 2014/2006
Music: alive School of Samba in Carnival
Edition: Analivia Cordeiro
Production: Analivia Cordeiro

Cambiantes version I, 4min58sec, color, Brazil 1976
Performers: Analivia Cordeiro, Beatriz Maria Luiz,
Cybele Cavalcanti, Fabiana Cordeiro
Photographer/Camera: Pedro Farkas
Music: Raul do Valle
Edition: Analivia Cordeiro
Production: Computer Center of State
University of Campinas   UNICAMP
and Prefeitura de Campinas

Cambiantes version II, 5min9sec,
black&white, Brazil 1976, 2014
Performers: Analivia Cordeiro, Beatriz Maria Luiz,
Cybele Cavalcanti, Fabiana Cordeiro
Photographer/Camera: Pedro Farkas
Music: Raul do Valle
Edition: Analivia Cordeiro
Production: Computer Center of State University of
Campinas   UNICAMP and Prefeitura de Campinas

DJMobile, color, 30sec, Brazil 2005
Performers: Analivia Cordeiro, Alexandre Kloc,
Gilson Kloc, Grilo
Production: Fox   TV

Education, 1min7sec, black&white, Brazil 2007
Performers: Analivia Cordeiro, Lucas Tumkus
Music: Education by Modest Mouse
Edition: Analivia Cordeiro
Production: Analivia Cordeiro

Flesh I, 7min13sec, color, Brazil 2004
Performer: Cristina Brandini
Poem: E.E. Cummings, 1958
Music: human sounds mixed by Analivia Cordeiro
Edition: Analivia Cordeiro
Production: Analivia Cordeiro

Flesh II, 3min, color, Brazil 2005
Performers: Analivia Cordeiro
Poem: E.E. Cummings, 1958
Music: Prelude G Sharp Minor by Rachmaninov
interpreted by David Hellfgott
Edition: Analivia Cordeiro
Production: Analivia Cordeiro

Flesh III, 4min8sec, color, Brazil 2007
Performers: Analivia Cordeiro, Cristina Brandini
Poem: E.E. Cummings, 1958
Music: Analivia Cordeiro
Edition: Analivia Cordeiro
Production: Analivia Cordeiro

Gestures, 4min24sec, black&white, Brazil 1975
Performers: Analivia Cordeiro, Fabiana Cordeiro
Music: John Cage
Edition: Antonio Carlos Rebesco
Production: TV Cultura de SãoPaulo

Kwarup, 16min 36sec, color, Brazil 1975
Performers: the whole Kamaiurá Tribe
Music: sounds of everyday life and the song Paraná
Edition: Analivia Cordeiro
Production: FAPESP

Laban Art of Movement, 25min10sec, color, Brazil 1999
Performers: Analivia Cordeiro, André Sampaio,
Bruno Sampaio, Claudia Barnabé, Claudio Kozakowski,
Cybele Cavalcanti, Gilson Kloc, Luciana Stoiani, Mara
Cordeiro Kloc, Maria Luiza de Lima, Gregoire Cordeiro
Belhassen, Leonard Cordeiro Belhassen, Nilton Lobo
Guedes, Thomas Cordeiro Guedes, Thomas de Felipe,
Tião Carvalho, Zelia Monteiro
Music: Rodolpho Grani Jr.
Edition: Analivia Cordeiro and Tamara Ka
Production: Analivia Cordeiro

Laban History, 7min20sec, color, Brazil, 1999
Performers: Analivia Cordeiro, Cybele Cavalcanti,
Denilton Gomes, Fabiana Cordeiro, JC Viola, Juliana
Carneiro da Cunha, Lisa Ullman, Maria Clara Guedes,

Maria Duschenes, Marie Albertas, Patricia Noronha,
Ruth Toledo, Silvia Duschenes
Edition: Analivia Cordeiro
Production:

M3x3, 6min30sec, Brazil 1973
Performers: Analivia Cordeiro, Beatriz Maria Luiz, Cybele
Cavalcanti, Eliana Pena Moreira, FabianaCordeiro, Marina
Helou, Nira Chernizon, Silvia Bittencourt, Solange Arruda
Music: metronome sound
Production: TV Cultura de São Paulo

Micron Virtues, 8min51sec, Brazil 1992
Performers: Analivia Cordeiro, Lali Krotoszynski,
Luciana Gandolpho, Rosa Hercoles
Music: 7th Symphony 2nd mov by Mahler
Edition: Analivia Cordeiro
Production: Analivia Cordeiro

Nota-Anna bicycle by Pelé, 30sec, color, Brazil 1994
Music: Rodolpho Grani Jr.
Edition: Analivia Cordeiro
Production: Analivia Cordeiro

Nosotros El Pueblo, 36sec, color, Brazil 2007
Performers: Alexandre Kloc, Analivia Cordeiro
Music: Wonderful Copenhagen by Dave Brubeck   uartet
Edition: Analivia Cordeiro
Production: Analivia Cordeiro

Save the Nature, 55sec, color, Brazil2007
Performers: Analivia Cordeiro, Thomas Cordeiro Guedes
Music: Aluja de Xango by Baba Messias
Edition: Analivia Cordeiro
Production: Analivia Cordeiro

Slow Billie Scan, 4min6sec, color, Brazil 1987
Performers: Analivia Cordeiro, Lali Krotoszynski
Music: Don't Explain by Billie Holiday
Edition: Analivia Cordeiro
Production: Image and Sound Museum - MIS

Striptease, 9min50sec, color, Brazil 1997
Performers: Analivia Cordeiro
Poem: Written in the Skin by Ademir Assunção
Music: Rodolpho Grani Jr.
Edition: Analivia Cordeiro
Production: Analivia Cordeiro

Touch Performance, 7 min31sec, color, Brazil 2009
Performers: Analivia Cordeiro, João Penoni
Edition: Analivia Cordeiro
Production: Paço das Artes

Trajectories, 2min19sec, black&white, Brazil 1984
Performers: Carolina Melardi, Caroline   uintella,
Juliana Sayão, Luciana Stoiani
Music: by Chopin
Edition: Analivia Cordeiro
Production: Analivia Cordeiro

Understable Fuzziness, 2min11sec, color, Brazil 2007
Performers: Analivia Cordeiro, Cybele Cavalcanti
Poem: Picture of Spring by Vladimir Maiakóvsky
Music: Air on G string by Johann Sebastian Bach
Edition: Analivia Cordeiro
Production: Analivia Cordeiro

Unsquare Dance, 2min34sec, color, Brazil 2007
Performers: Alice Bodansky, Analivia Cordeiro, Ilana
Paterman, Julio Lucio, Thomas Guedes
Music: Unsquare Dance by Dave Brubeck   uartet
Edition: Analivia Cordeiro
Production: Institute of Applied Mathematics - IMPA

You, 2min44sec, color, Brazil 2011
Performers: Analivia Cordeiro, Breno Flesh, Erica Usui,
Roberto Moraes and Grupo Amudi
Edition: Analivia Cordeiro
Production: Polytechnic School of University of São Paulo

Wearables, 9min45sec, color, Brazil 1989
Performers: Analivia Cordeiro, Andrea Kraemer, Carmita
Lion, Glaucia Amaral, Liana Bloisi, Fernando Penteado,
Maria Teresa Castor, Silvia Mecozzi
Music: Laurie Anderson, Carlos Saura, Shadowfax,
Traditional Japanese Music, Ruidos Y Ruiditos, Nino Rota
Edition: Analivia Cordeiro
Production: Miriam Mamber Gallery

What We Have Done, 43sec, color, Brazil 2007
Performers: Analivia Cordeiro, Thomas Guedes
Music: metronome and Rainforest by Ken Davis
Edition: Analivia Cordeiro
Production: Analivia Cordeiro

ABOUT THE AUTHORS

JEANNE BEAMAN born 7 October, 1919, San Francisco began her career in dance as a member of the San Francisco Ballet 1938-40 . She studied at the School of American Ballet and with Martha Graham in New York in 1936, attended the Bennington School of Dance in 1938, and on the West Coast she studied with Adolph Bolm, William Christensen, May O' Donnell and José Limón. In 1942 she received an M. A. in Physical Education at Mills College. In the 1960s she was making some of the first computer dances. Beaman is Professor Emerita at the University of Pittsburgh, where she taught from 1961 to 1974.

She was a founder of the American College Dance Festival Association and the Pittsburgh Dance Council. After moving to Massachusetts in 1974, Beaman became Dance Coordinator of the Massachusetts Arts and Humanities Foundation 1975-78 .

From 1979 to 1982 she was a dance evaluator for the New England Foundation for the Arts. She served as a member of the Massachusetts Cultural Council from 1986-1992. Jeanne Beaman received the Dance Alliance' s Dance Champion Award in 2004.

FERNANDO COCCHIARALE, PhD, professor and independent curator. He wrote the book Abstracionismo Geométrico e Informal, with Anna Bella Geiger Rio de Janeiro: Funarte, 1987 and has also written numerous articles and essays and books, catalogues, newspapers and art magazines in Brazil and abroad. He was Funarte Visual Arts Coordinator 1991-1999 and curator-coordinator for the Rumos ItauCultural Artes Visuais 1999-2000 and 2000-2002 . He participated on j uries and selection committees for more than 20 exhibitions such as 10th, 15th and 16th National Fine Art Salons in Rio de Janeiro 1987, 1995 and 1998, respectively . He was curator of the Museum of Modern Art of Rio de Janeiro 2000-2007 and Laura Alvim Cultural Center, Rio de Janeiro 2011-2012 . A fiew of the exhibitions he curated won important prizes like Hélio Oiticica: Museu é o Mundo ItauCultural, 2011 and Waldemar Cordeiro: Fantasia Exata ItauCultural, 2013 . He lives and works in Rio de Janeiro, Brazil.

GILBERTO DIMENSTEIN is a Brazilian journalist. He is currently the publisher of Catraca Livre, appointed by Financial Times as one of the most inspiring applications of digital technology for social good. He also keeps a column at CBN radio.

Dimestein has published many works regarding human, children'a and youth rights, besides works on citizenship. For 2011 he was a Fellow at Harvard's Advanced Leadership Initiative, where he worked in partnership with researchers at the Media Lab of MIT on an Internet program to help cities transform themselves into learning communities Open City Labs, known as Catraca Livre Free Turnstile in Brazil .

He started his career at Shalom, a magazine dedicated to the Jewish community. Subsequently, he worked in Veja, Jornal do Brasil, Correio Braziliense, ltima Hora. For his reporting on social issues and his experiences with educational projects, Gilberto Dimenstein was named by poca magazine in 2007 as one of the hundred most influential figures in the country. Dimenstein was one of the creators of Andi News Agency for Children's Rights , which is circulated in Brazil and several countries in Latin America. In 2009, a document prepared at Harvard Business School, named him as an example of community innovation for his neighborhood-school project initially developed in São Paulo and replicated across the country.

MARIA DUSCHENES Budapest, 26 August, 1922 São Paulo, 5 July, 2014 is a pioneer of modern dance in Brazil. As a teacher and choreographer was the main person disseminating the work of Laban in the country, offering practical and theoretical training in Laban Movement Theory for educators, psychologists, dancers, choreographers and actors.

JOHN LANSDOWN 2 January 1929 Cardiff, Wales 17 February 1999 was a British computer graphics pioneer, polymath and Professor Emeritus at Middlesex University Lansdown Centre for Electronic Arts, which was renamed in his honor in 2000. From the early 1970s to the 1990s, he had influential roles in several professional bodies, and chaired the Science Research Council's Computer Aided Building Design Panel, through which he implemented a world leading strategy for developing computer aided

architectural design in British universities. He had enormous influence as one of the founders and as secretary of the Computer Arts Society 1968 1991 .

The Science Research Council's Computer Aided Building Design Panel, through which he implemented a world leading strategy for developing computer aided architectural design in British universities. He had enormous in uence as one of the founders and as secretary of the Computer Arts Society 1968 1991 .

MARCELO LEITE is special reporter and columnist for the prestigious Brazilian newspaper, Folha de São Paulo Folha and also at the digital media version, Folha.com.

Graduated in Journalism by the School of Communications and Arts at USP 1979 , he was also the Ombudsman at Folha 1994-1996 , representing the interests of readers by the Writing Department. He was also editor of Science, Opinion and World and correspondent in Berlin.

His doctoral thesis in Social Sciences from the State University of Campinas Unicamp was published in March 2007 by Editora UNESP, with the title of Promises Genome . Despite the academic degree, he does not consider himself a social scientist.

He specialized in science journalism as a Fellow of the Krupp Foundation in Germany 1989-90 , where he apprenticed in the magazine Bild der Wissenschaft and the newspaper Stuttgarter Zeitung . In 1997-98, he was Nieman Fellow at Harvard University. In 2005, he received the José Reis Award for Scientific Journalism, the National Council for Scientific and Technological Development CNPq . In 2009, won the Esso Award for Scientific Information, Technological and Ecological with the special magazine staff In the Heart of the Antarctic .

ARLINDO MACHADO, born in Pompeia Sao Paulo state , on July 17, 1949, is a Brazilian researcher, professor of the Graduate Program in Communication and Semiotics at PUC-SP and the Department of Film, Radio and Television of ECA-USP and curator of art. Its field of action covers the universe of so-called imaging techniques , ie those images produced by various technological mediations, such as photography, film, video and digital media.

On these topics, he published some books, as Eisenstein: Geometry of Ecstasy Brasiliense , A speculate Illusion Brasiliense , The Video Art Brasiliense , Pre-cinemas & Post-cinemas Papirus , The Television Taken Seriously Senac , Art and Media Zahar and numerous articles in specialized journals. It is also co-author of Made in Brazil: Three Decades of Brazilian Video Ita cultural . It was critical of photography and video in the Folha de São Paulo journal during the period 1984-86. In the art area, he was curator of several exhibitions, including Art and Technology MAC, São Paulo, 1985 , Cinevideo MIS, Sao Paulo, 1992, 1993 , The Video Art in Brazil MAM, Rio de Janeiro, 1997 , Art and Technology, and Emotion Art.ficial II ItauCultural Institute, São Paulo, 1997, 2001, 2003, 2004 , Waldemar Cordeiro: Fantasia Exata ItauCultural, 2013 .

He also organized several exhibitions of Brazilian and international electronic art and directed six short films in 16 and 35 mm and three multimedia works on CD-ROM. He received the National Photography Award from FUNARTE in 1995 and the Art and Technology Award Sérgio Motta in 2007.

MARTIN J. TRACY, M.A. in Dance Ethnology; Ph.D. candidate in Biotechnology, University of California, Los Angeles; author of article on comparative movement notation and computer assisted choreography; currently teaching in the Department of Dance, University of California, Los Angeles, 1976.

LUIS VELHO is a Full Researcher/Professor at IMPA   Instituto de Matemática Pura e Aplicada of MCT, and the leading scientist of VISGRAF Laboratory. He received a BE in Industrial Design from ESDI/UERJ in 1979, a MS in Computer Graphics from the MIT/Media Lab in 1985, and a PhD in Computer Science in 1994 from the University of Toronto under the Graphics and Vision groups. His experience in computer graphics spans the fields of modeling, rendering, imaging and animation. He has published extensively in conferences and journals of the area. He is the author of several books and has taught many courses on graphics-related topics. He is a member of the editorial board of various technical publications. He has also served on numerous conference program committees.

ACKNOWLEDGEMENTS

ANALIVIA CORDEIRO
HUMAN MOTION – IMPRESSION/EXPRESSION

CONCEPTION
Analivia Cordeiro

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