STOCOS

acusmatrix@pablopalacio.com

http://www.pablopalacio.com/SONIC_DANCE.html

cell: +34 659958080

CONTENTS

1. GENERAL DESCRIPTION

Stocos is the third part of a trilogy centered on the analysis and development of the interaction between sonic gesture and dance gesture. This series of pieces are developed inside a set of loudspeakers surrounding both the stage and the audience, and within which sound objects move and transform following spatial trajectories associated with the movement of the dancers.The first and second parts are Acusmatrix and Catexis respectively. This project has been supported by Mercat de las Flors, Teatros del Canal, University Alcalá de Henares, La Casa Encendida, La Comunidad de Madrid, Hebel Halle (Heidelberg, Germany) and El Graner (Barcelona).

Stocos expands the scope of the trilogy in that it creates gestural relationships not only between dancers and music but also between simulated entities and computer generated imagery. The activities of the dancers, virtual entities, music and visuals relate to each other via underlying processes of brownian movement and flocking behavior. Accordingly, a dense network of mutual influences emerges that establishes coherency among the spatial, perceptional and behavioral properties of its natural and artificial participants. The simultaneity and causality of these activities and their spatially distributed multimodal presence transforms the stage into a hybrid ecosystem in which various forms of mutual dependencies coexist.

1.*Stochastic: A process in which the step or change from one state to another is defined by a probability function*.

Stocos creates a three-dimensional space in which natural and artificial entities coexist, interrelate and overlap. It relies on stochastic processes and swarm simulations for the creation of dance movements, musical compositions and visual imagery. Throughout the performance, a dense network of mutual interactions among algorithms, dance, music and visuals establishes coherence, simultaneity and presence in the behavioral and aesthetic characteristics of the piece.

The musical composition is based on the stochastic processes of brownian motion, a method that was initially devised by Iannis Xenakis. **Stocos** develops an extension of this approach using swarm simulations. These processes also define some of the dancer's movement sequences and they affect the swarm based live imagery. The spatial movements of the music are achieved via an octaphonic speaker ring that surrounds both the stage and audience space.

The video imagery is life generated and renders the spatial movements of various interactive swarm simulations that have been specifically developed for the piece. The imagery is projected seamlessly on the back of the stage, the stage floor and the dancers bodies in an attempt to create a behavioral and visual continuity between the natural properties of the space, its inhabitants and the simulated entities. The characteristics of these responsive visuals continually changes from a dynamic property of the entire space to that of autonomous virtual dancers improvising on stage up to that of a artificial skin that covers the dancer's bodies.

The dance performance combines pre-choreographed and improvised sequences for two human dancers and virtual dancers. The dancer's abstract gestures explore the network of mutual dependencies and causalities that relate them to the musical and visual activities on stage. The choreography reflects the properties of the hybrid ecosystem, that responds favorable or antagonistic but never neutral to the activities of its inhabitants.

·*CONCEPTION AND IDEA*: Pablo Palacio y Muriel Romero ·*CHOREOGRAPHY:* Muriel Romero
·*PERFORMANCE*: Begoña Quiñones and Muriel Romero ·*MUSIC COMPOSITION*: Pablo Palacio.
·*INTERACTIVE VISUALS AND SWARM SIMULATIONS*: Daniel Bisig.
·*PRODUCTION:* Muriel Romero y Pablo Palacio.
·*COPRODUCTION:* Mercat de las Flors.
·*SUPPORTS:* Teatros del Canal (Madrid, Spain), Comunidad de Madrid, Hebel Halle (Heidelberg, Germany), El Graner (Barcelona, Spain), Festival VAD (Girona, Spain).

2. DANCE MOTION AND RANDOM WALKS

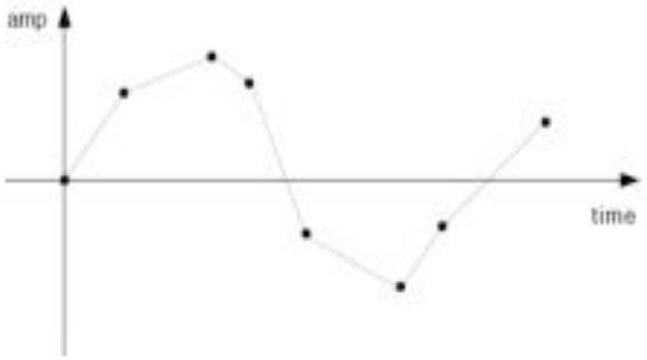
A choreography is composed of subsenquent steps. Each of these steps are connected in a more or less deterministic way. The steps that compose a *random walk* are connected using probability distributions that may generate trajectories that evolve in a more or less deterministic fashion.

From a formal point of view in Stocos, we will use random walks as a model to generate dance motion, starting from a disorder concept and then introduce means that increase or reduce it. In this manner each new step is obtained applying stochastic variations to the previous one.

Another choreographic approach in Stocos is to use random walks to "*walk"* among the different steps that comprise a previously composed variation. This produces a constant change in its structure. Different random walks are used for each dancer, thus creating a sort of reverberation of the original variation. These algorithmic procedure is generated in Supercollider language.

3. SOUND GENERATION IN STOCOS: STOCHASTIC SOUND SYNTHESIS.

Sound in Stocos is generated using a software implementation of dynamic stochastic synthesis, a rigorous algorithmic composition procedure conceived by Iannis Xenakis. It uses mathematical concept of random walks to produce both duration structure and timbral fluctuations in computer generated sound, resulting in a huge gamut of sonic entities.



Using Stochastic Synthesis to generate the amplitud pressure curve of sounds. Each breakpoint value is obtained using probability distributions.

An original version of the algorithm was written in Supercollider language.
The standard distribution of Supercollider comes with some unit generators that apply this procedure, but none of these were used in Stocos since they include several simplifications.

Stocos proposes an extension of the Xenakian algorithm using swarm simulations to modulate the parameters that define the dynamic stochastic algorithm. These parameters are, at some moments of the piece, controlled by the activity of the dancers.

Concerning the sound diffusion an eight loudspeaker array surrounds the audience and the stage. The sounds move through the speaker set developing their own choreography.

4. INTERACTIVE VISUAL SIMULATION: SWARM BEHAVIOUR.

Swarm behaviour is a branch of artificial intelligence based on the collective behaviour of self-organised systems. Swarm intelligence systems are composed of agents that interact among themselves and with their environment.

A biomimetic multi-agent simulation will be specifically developed for the piece.

The simulation synchronizes the dancer's activities on stage with the self-organized dynamics of groups of agents that engage into coherent movements.

The agent movements serve as a generative mechanism that underlies the real time creation and control of computer based video and music.

As a result, the stage becomes a responsive environment whose visual and acoustic properties emerge from the mutual interactions between dancer and simulation.

5. PERFORMANCES AND OTHER ACTIVITIES RELATED WITH THE PROJECT

· *Stocos* will be performed at Roma Europa Festival. Roma (Italy). November 17th. Supported by Instituto Cervantes.

· *Stocos* will be performed at Palacio de Festivales de Santander. Santander (Spain) on November 2nd, 2012.

· *Stocos* will be performed at Auditorio de Tenerife. Tenerife (Spain). Between October 27th and November 1st.

· *Stocos* will be performed at Dansa Valencia (Valencia, Spain), on June 2nd, 2012.

· *Master class on Stocos* at Dansa Valencia (Valencia, Spain), on June 1st, 2012.

· *Stocos* will be performed in Festival de Otoño en Primavera de Madrid on May 17th-18th, 2012.

· Performance of *Facing the Blank Page Installation* at Fabbrica Europa Festival (Florence, Italy). February 18th, 2012.

· *Stocos* will be performed at Hebel Halle (Heidelberg, Germany), on April 28th-29th, 2012.

· *Stocos* will be performed at BIPOD (Beirut International Platform of Dance)in Beirut (Lebanon) on April 25th, 2012. Supported by Instituto Cervantes.

· *Stocos* will be performed at Amman Contemporary Dance Festival in Amman (Jordan) on April 22nd 2012. Supported by Instituto Cervantes.

· *Stocos* will be performed at Ramallah Contemporary Dance Festival in Ramallah, on April 19th 2012 (to be confirmed).

· An interactive multichannel rhythmic environment will be presented at the CIRMMT is the Centre for Interdisciplinary Research in Music Media and Technology at McGill University (Montreal, Canada) . February 19th, 2011.

· Teaching *Sonic Space*. In the context of the Master in Performing Arts Practices and Visual Culture (UAH). At the National Museum Reina Sofía (Madrid, Spain). March 4th-11th, 2012.

· Performance of *Stocos* at Auditorio del Palacio de Congresos de Huesca (Huesca, Spain), March 2nd, 2012.

· Performance of *Stocos* at Teatro Circo Murcia (Murcia, Spain), February 16th, 2012.

· Lecture. At Franz Liszt Hochschule fur Musik. (Weimar, Germany), on February 12th.

· Residency at Bauhaus University (Weimar, Germany) as part of the Motion Composer project. November 14th-21st.

· Presenting virtual instruments for handicapped people at CYNETART, Festspielhaus Hellerau, Dresden. November 19th, 2011.

· *Stocos* performed at Mercat de las Flors. (Barcelona, Spain), on October 15th and 16th.

· *Stocos* performed at Temporada Alta (Gerona, Spain), on October 8th.

· *Stocos* production residence at Mercat de las Flors. Barcelona (Spain). In the period July 18th- August 8th, 2011.

· Seminar Workshop on sonic gesture at GVA Sessions 2011 Made in Festival Electron. Geneve (Switzerland). July 16th and 17th, 2011

· Performance of *Facing the Blank Page* at Festival Extra. Annecy (France). May 14th, 2011.

· Performance of *Catexis* at Bipod (Beirut Intenational Platform of Dance). (Beirut, Lebanon). April 28th, 2011.

· *Interactive Sonic Gesture* (Workshop). Conservatorio Superior María de Ávila. Madrid (Spain). March 15th and 16th.

· *Concert + conference with Palindrome*. March 7. Birmingham Conservatoire. (Birmingham, England).

· *Sonic Space (workshop)*. In the context of the Master in Performing Arts Practices and Visual Culture (UAH). National Museum Reina Sofía (Madrid, Spain). February 26th-27th and March 12th, 2011.

· *Project for handicapped (2010-2011)*. Developing interactive sonic technologies for handicapped people with Palindrome Intermedia performance group. Investigation residence in L'ARC, (Romainmotier, Switzerland). February 2011.

Performance of *Facing the Blank Page* at the Alliançe Française in Attakkalari India Biennal, Bangalore (India). January 30th 2011.

· Performance of *Catexis* at Art-Ort. (Heidelberg, Germany). October 8th, 2010.

· Workshop on Trevor Wishart's composition *Tongues of Fire* at Impresentables 2010, La Casa Encendida, (Madrid, Spain). June 23th, 2010.

· Performance of *Catexis* at MOVs, La Casa Encendida. (Madrid, Spain). June 11th and 12th, 2010.

· Performance of *Acusmatrix* at ARTe SONoro, La Casa Encendida. (Madrid, Spain). April 25th, 2010.

· Sonic compositon of *The Bending Line Project*, for Missouri State University (Missouri, EEUU). The piece will be premiered at the Ellis Hall for the Performing Arts on March 21, 2010.

6. ARTIST'S BIOS

Muriel Romero is a dancer and choreographer. Her work is currently focused on the investigation of generative choregraphic structures and the incorporation of abstractions taken from other disciplines such as music or mathematics. She has won several international prizes such as Moscow International Ballet Competition, Prix de la Fondation de Paris-Prix de Laussane and Premio Nacional de Danza. She's been first soloist in some the most prestigious companies around the world including Deutsche Oper Berlin, Dresden Semper Oper Ballet, Bayerisches Staatsballet Munchen, Gran Théatre de Genéve o Compañia Nacional de Danza. During her trayectory she's work with some choregraphers of our time like W. Forsythe, J.Kylian, Ohad Naharin or Saburo Teshigawara. She teaches at the Professional Conservatory of Madrid.

Pablo Palacio is an independent composer currently living in Madrid. His work has been focused on the transformation an perceptual connections of sonic images. He has held residences in Spain, Switzerland, Germany and Libanon, and his pieces have been performed in many countries from Europe and United States to China, India, Brasil, Australia or North Africa. He is also an active composer for dance and performing arts receiving commissions from, Palindrome Inter Media Performance Group (Weimar, Germany), Staatstheater Mainz (Mainz, Germany), Maqamat Dance Theater (Beirut, Libanon) or Cisco Aznar (Switzerland) among others. He also collaborates with several conservatories, universities and institutions through publications, workshops, and talks divulging new perspectives and technologies in sound composition. He is professor of sound space at the Master in Performing Arts and Visual Culture (UAH-Madrid).

Daniel Bisig was born in 1968 in Zürich, Switzerland. He holds a Master's and PhD degree in Natural Sciences, both from the Swiss Federal Institute of Technology. He is currently working at the Artificial Intelligence Laboratory of University of Zurich and at the Institute for Computer Music and Sound Technology, University of the Arts, Zurich.
Daniel Bisig is active as an artist in the fields of computer animation, experimental video and software art and has realized several interactive works for installation and performance. The simulation of biological behavior forms a central underlying commonality in all these works.
Daniel Bisig has collaborated with choreographers to realize generative visuals that respond in real time to the dancer's performance. In this sense he has collaborated in several occassions with Jiri Kylian or Pablo Ventura.

7. REFERENCES

Bateson, G. 1997: *Espíritu y Naturaleza,* Amorrortu Editores, Buenos Aires.

Bateson, G. 1998. *Pasos hacia una ecología de la mente,* LOHLÉ-LUMEN, Buenos Aires.

Forsythe, W. 1999 Improvisation Technologies, A Tool for the Analytical Dance Eye.(DVD). ZKM/Zentrum für Kunst und medientechnologie Karlsruhe.

Harrison, J. 1998. " Sound, Space, Sculpture: Some Thoughts on the 'What,' 'How,' and 'Why' of Sound Diffusion and Related Topics." *Journal of Electroacoustic Music*11:12–20.

Hawkins, D. 1958. "Mathematical Sieves." Scientific American199:105–112.

Laban, R. 1984. *A vision of dinamic space,* compiled by Lisa Ullman, Laban Archives in association with the Falmer Press, London and Philadelphia, 1984.

Luque, R. 2010. "The Stochastic Music of Iannis Xenakis". *Leonardo Music Journal, Volume 19. MIT Press. January 2010.*

Newlove, J.,and Dalby, J. 2004. *Laban for all*. Nick Hern Books. London

Serra, M.H. 1993. "Stochastic Composition and Stochastic Timbre :Gendy 3 by Iannis Xenakis. *Perspectives of New Music 39, no. 1.*

Smalley, D. 1997. " Spectromorphology: Explaining Sound Shapes." *Organised Sound* 2(2):107–126.

Wishart, T. 1996. *On Sonic Art*, S. Emmerson (ed.)

Xenakis, I. 1971 *Formalized Music*. Revised Edition: Pendragon Press(1992)