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Centro de Arte y Creación Industrial

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IN COLLABORATION WITH:

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TRAVELLING TO (MARCH - JULY 2009)

ZKM
Center for Art and Media
Karlsruhe

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Banquete_nodos y redes

INTERACTIONS BETWEEN ART, SCIENCE, TECHNOLOGY AND SOCIETY IN SPAIN'S DIGITAL CULTURE

THE EXHIBITION

banquete_nodos y redes underscores an emerging interdisciplinary dynamics taking place in the art practices currently being made in Spain. Through over thirty projects of digital and interactive art creation, the show proposes a number of critical reflections and participative experiences to explore the Network as a shared matrix. Photographs, videos, Virtual Reality installations, artificial life robotic actions or net.art participative projects provide a wide range of postulates taking us from neuronal microworlds to the global dynamics of digital connection in contemporary societies.

IDEA AND CONCEPT: Karin Ohlenschläger and Luis Rico

Karin Ohlenschläger. An art critic and exhibition curator specialising in contemporary art and new technologies. From 2002 to 2006 she was the the co-founder and co-director of the MediaLabMadrid programme at Centro Cultural Conde Duque in Madrid and is a founding member of Fundación Banquete. Ohlenschläger has directed, among other initiatives, the *Chips Events: emerging Digital Culture Circuits* at the Instituto Europeo de Diseño in Madrid (2001), the International *Festival of Infoarchitecture*, Ministerio de Fomento, Madrid (1997), *IN ART* –International Cybernetic Art Festival, Tenerife (1996), and the *International Video Forum* at the former Spanish Museum of Contemporary Art of Madrid (1986-88). She has curated countless exhibitions of new media art.

Luis Rico. Artist, researcher and cultural producer. Co-founder and co-director of MediaLabMadrid, a transdisciplinary programme focused on the exploration of new models of cultural diffusion, research, education and production at the Conde Duque Cultural Centre (CCCD) in Madrid. Worth underscoring is Rico's co-direction of the 1st International Festival of Art, Science and Technology, Cybervision, at the CCCD in Madrid (2002), and the exhibitions banquete_metabolismo y comunicación (2003), banquete_comunicación en evolución, (2005), and Digital Transit at CCCD, co-produced by Ars Electronica Center from Linz and MediaLabMadrid. He is currently directing the R&D programme on ecophysiology of creation and knowledge transfer.

CURATED BY: Karin Ohlenschläger
DATES: 06.06 -03.11.2008
OPENING HOURS: Wednesday to Monday, 12:00 to 20:00
VENUE: Galleries 1A, 1B y 1C, LABoral Centro de Arte y Creación Industrial, Gijón
PRODUCED BY: Sociedad Estatal para la Acción Cultural Exterior (SEACEX), Fundación Telefónica and LABoral Centro de Arte y Creación Industrial
IN COLLABORATION WITH: Government of Spain, Spanish Ministry for Foreign Affairs and Cooperation, Spanish Ministry for Culture
EXHIBITION DESIGN: Jovino Martínez Sierra, Architect
TRAVELLING TO: March-July 2009, ZKM, Center for Art and Media, Karlsruhe, Germany

ARTISTS / WORKS:
Aetherbits. *Social Synthesizer_prototype* (2008)
Abad, Antoni. *canal*MOTOBOY* (2007/08)
Abad, Antoni. *GENEVE*accessible* (2008)
Ampudia, Eugenio. *Crédulos / Credulous* (2002)
Andújar, Daniel G. / Technologies To The People. *X-devian. The New Technologies to the People System* (2003)
Antúnez, Marcel.lí. *Protomembrana / Protomembrane* (2006)¡
Armesto, Pablo. *Secuencias 24 / Sequences 24* (2005/08)
Berenguer, José Manuel. *Luci.sin nombre y sin memoria / Luci.without name and without memory* (2008)
Boj, Clara and Díaz, Diego. *Observatorio / Observatory* (2008)
Canogar, Daniel. *Tangle* (2008)
Canogar, Daniel. *Otras Geologías 9 / Other geologies 9* (2005)
Castro, Álvaro. *Vaccuum Virtual Machine* (2008)
Colunga, Alfredo. *E-day for energy* (2008)
Escoitar. *Aire, sonido y poder: Tecnologías de control social con sonido en Gijón: una cartografía / Air, sound and power: technologies of social control with sound in Gijón, a map* (2008)
Evru. *Tecura 4.0* (2005/08)
Fontcuberta, Joan: *Googlegrame Ozono* (2006)
Fontcuberta, Joan: *Googlerame Prestige* (2007)
García, Dora. *Todas las historias / All the stories* (2001/08)
Gonzalo, Marta de and Prieto, Publio P. *La intención / The intention* (2008)
Hackitectura. *Wikiplaza* (2006)
Hackitectura. *Geografías Emergentes / Emergent geographies* (2006)
Iglesias, Ricardo. *José, un robot autista / José an autistic robot* (2007)
Influenza. *Madrid Mousaic / Madrid Mosaic* (2005)
Jerez, Concha and Iges, José. *Terre di nessuno: Arenas Movedizas Movedizas/ No man's land: Quicksand* (2002/08)
Kònic Thtr. *mur.muros/distopía# II* (2007/08)
Laboratorio de Luz. *Modulador de luz 3.0 / Light modulator 3.0* (2006/2008)
Leandre, Joan. *nostalG2//L'AGE D'OR NFO.EXE* (2003/08)
Neokinok TV. *Tvlata / TvTin* (2007)
Núñez, Marina. *Untitled (ciencia ficción)* (2001)
Núñez, Marina. *Sin título (ciencia ficción)* (2002)
Ortuño, Pedro. *Blanca sobre negra / White on black* (2004)
Paricio, Raquel and Moreno Aróstegui, J. Manuel *POEtic Cubes* (2007/2008)
Platoniq. *Banco común de conocimientos / The bank of common knowledge* (*BCC)* (2006/08)
Ruiz de Infante, Francisco. *Reina / Queen* (2007)
Simó, Águeda. Reflecting JCC Brain Research II (2007)

PROGRAMME OF ACTIVITIES

DIALOGUES WITH THE ARTISTS AND CURATOR

06.06.2008

With the programme DIÁLOGOS, presented for the first time at this exhibition, LABoral wishes to bring the public from Asturias into closer contact with the artistic object through its designers, artists, creators and curators.
OPENING HOUR: 18:00
VENUE: LABlounge.
DURATION: 1:30 minutes

WORKSHOPS

26-30.05.2008

Aire, sonido y poder: Tecnologías de control social con sonido (*Air, Sound and Power: Social Control Technologies with Sound*)
DIRECTED BY: Escoitar
The sound creation collaborative Escoitar directs this workshop developed in the La Calzada district in the city of Gijon in collaboration with Ateneo Obrero. The workshop focuses on the so-called social control technologies that use sound or music to exert power or control as a form of attack or defence (e.g. in the case of acoustic weapons).
OPENING HOURS: 16:00 to 21:00
VENUE: Ateneo Obrero de La Calzada and LABoral Centro de Arte y Creación Industrial

05.05.2008

Transmite, distribuye, comparte (*Transmit, Distribute, Share*)
DIRECTED BY: Platoniq
Platoniq's projects attempt to promote free access to culture, sharing media, contents and organisational processes, experimenting with new articulations of theory-action-dissemination. The workshop analysed the methodologies and tools of Platoniq's most recent projects, Open Server, Burn Station and Banco Común de Conocimientos, conceived to facilitate a better understanding of the strategies used as well as to generate working sessions around new roles and challenges of collective cultural production.
OPENING HOURS: 16:00 to 21:00
VENUE: LABoral Workshops

07.06 2008

Ojos que quieren más (*Eyes that want more*)
DIRECTED BY: Marta de Gonzalo and Publio Pérez Prieto
Artists and lecturers, the directors of the workshop propose the need for a democratic education empowering citizens with an audiovisual literacy of the deconstruction tools that are required for a correct response vis-à-vis the information they receive, differentiating the communicational strategies used and the underlying aims in a critical and subconscious way.
OPENING HOURS: 16:00 to 20:00
VENUE: LABcine

07.06.2008

DIT. Do it Together. Workshop Series .A theory-practice encounter of Technologies To The People and Daniel G. Andújar

DIRECTED BY: Daniel G. Andújar

The aim of this workshop is to forge a close dialogue among the participants, allowing a better understanding of the new transformative processes of our reality. The technical and cognitive change represents the emergence of new trades, the acquisition of new knowledge by artists and creators, and requires the implementation of new forms of organisation of the work of cultural creation and production in multidisciplinary teams.

OPENING HOURS: 16:00 to 20:00

VENUE: In the artist's installation

02-03.10.2008

Tecura 4.0

DIRECTED BY: Evru

Tecura 4.0 is a digital painting machine which, more than a simple entertainment artefact, is an external link to attain a conscious connection with a person's creativity. This painting workshop with tools created by Evru is targeted at school students with special needs. Under the slogan "Art for healing: every person has an artist inside himself", with this programme the artist attempts to involve disabled people in a process stimulating and fostering creativity, which encourages the production of personal works using tools and templates.

VENUE: LABoral Workshops

INVESTING IN CULTURAL COOPERATION NETWORKS

By **State Society for Exterior Cultural Action of Spain (SEACEX)**

Seduced by constantly changing images, one of the recurrent focuses of the contemporary gaze is the mobile surface of the screen, its increasingly fuzzy contours and its power to invent, reconstruct or interpret reality. Given this perspective, posing new and continuous challenges for the connection with science and technology, creative experimentation, assisted by the potential of digital advances, represents one of the most enthralling and promising realms for an activity overstepping the conventional boundaries of art. In this field, Spain's current contribution has a special value and deserves the kind of attention we are now seeing in this exhibition. Its goal is to develop a system of relations between personal and international initiatives fostering links between creation and research in consonance with present-day society. In this regard, this exhibition of digital art can be viewed as one of the core axes of a more ambitious project also embracing a project on computer research and a communication and production platform.

A project such as this fits in to perfection with the goals of SEACEX (State Society for Exterior Cultural Action of Spain), a public body acting as an agent for the promotion of our country's cultural reality, with a strategy for international dissemination based on high standards of rigor concerning knowledge and representing a concerted effort to contain all the contributions from the most varied fields of knowledge and art that make up the structure of a modern nation whose most telling sign of identity is plurality.

Banquete_nodos y redes is a project responding to a shared effort to create and consolidate local, national and international cultural cooperation networks, endorsing interdisciplinary digital communities and exploring the potential for symbiosis between art, new technologies and social demands. And all of it grounded in close dialogue between sciences and humanities.

The alliance of LABoral, Centro de Arte y Creación Industrial, ZKM Center for Art and Media, and Fundación Telefónica, allows SEACEX to continue furthering the profile of Spanish culture abroad, to increase and strengthen the presence of Spain's contemporary creation in international markets, to consolidate cultural cooperation, and to provide a framework for the relationship between art practitioners and professionals that will contribute to the emergence of sustainable networks.

A REFLECTION ON THE NEW PARADIGM OF THE INTERNET ERA

By **César Alierta.** President of Fundación Telefónica

Without the shadow of a doubt, the social transformations we are witnessing at the beginning of this new millennium have their origin in the impact of information and communication technologies, and very especially Internet.

The digital revolution is cutting across traditional space-time borders to make possible the phenomenon of communication at a global scale as well as the development of interactivity in a totally unprecedented fashion.

As a universal means of communication, Internet is a true web that not only enables traffic between opposite sides of the planet, but also to join and take part in virtual communities, that is, in what we know as *network society*.

In the same way as the invention of the printing press by Gutenberg meant a seachange in the then existing cultural model, the irruption of Internet is transforming the role of art and culture, aesthetic production and art and scientific techniques. Under the influence of Internet, we are seeing a true transformation in the ways of creating, producing and distributing artworks and indeed a questioning of the very concept of creation.

banquete_nodos y redes showcases over thirty digital projects combining technological innovation with art creation, exploring the connections between art, science and technology.

At this crossroads, I wish to celebrate Fundación Telefónica's collaboration with LABoral, the involvement of SEACEX, and the coordination with ZKM, in maintaining an ongoing line of research into the complexity of the art fact associated with supports, media and languages of expression, and also in the proposal for a reflection on the new paradigm of the Internet era contained in this exhibition.

METHODS IN ART AND SCIENCE

By **Peter Weibel**. Director of ZKM | Center for Art and Media Technology, Karlsruhe

Banquet_nodes and networks is an example for the current paradigm shift in curating contemporary art. The time of surfing on a hedonistic wave seems to be over. Works of art addressing science, technology and society are becoming more and more relevant. Traditional art after 1945 obscured the relationship between art and science, and only the media arts maintained a dialogue and contact with the sciences, because they themselves were based on technology.

Artists are attracted to the methods of science, because they sense their structural similarity to the methods of art. The methods of art are different from the methods of science, but are still methods. Art and science should be compared on the basis of the different methodologies and their parallels and differences. Science is not influenced on the level of production by art, but on the level of methods. Because any time that science develops a tendency for its methods to become too authoritarian, become too dogmatic, science turns to art and to the methodology of art, which is a plurality of methods. The methods of science are characterized by doctrines, by enforced methodology. Art lives on the tolerance of methods, on the diversity of methods. The success of Ramon y Cajal in discovering the true nature of the neural nets is not only due to the method of Camillo Golgi, who articulated a wrong theory about the dynamics of the neural nets. The success has also to do with Cajal's artistic virtuosity in drawing. Cajal is an example of the mutual influences of art and science of a higher order.

In his book from 1984 *Science as Art*, Paul Feyerabend tried to show the mechanisms of the social construction of science which are comparable to the mechanisms of the social construction of art. A community of institutions and individuals (artists, critics, curators, collectors, galleries, museums) creates a social consensus about what art is. Likewise a community of institutions and individuals agrees consensually what science is. From time to time there are individuals who challenge the consensus and propose a change of paradigms. In his books *Laboratory Life* (1979) and *Science in Action* (1987), Bruno Latour shows that our idea of modernity is based on a strict distinction between natural and social instances. But he shows that the distinction between culture and nature, between society and natural sciences is not totally clear. How much social instances helped to construct nature and how much have the natural sciences and their ideas of nature constructed culture and society? He claims that in reality there is an exchange between society and nature and art and natural sciences, which has created hybrids. The transfer of social

categories on the construction of nature through modern natural sciences has also transformed our society. The transfer of natural categories on the construction of culture through modern society has transformed and defined our ideas of society and culture. There is a mutual transfer going on between society and culture, nature and natural sciences, between culture and natural sciences. There is no objective nature any more, separated from social construction. Art and science meet and converge in the method of social construction. Art as social construction and science as social construction converge in the postmodern field. Just as the *banquet_nodes and network* exhibition shows, and Manuel Castells explained in "The Rise of the Network Society" (1996), volume one in his trilogy *The Information Age: Economy, Society and Culture*, our technological devices are social constructions too, and Internet doesn't make any exception.

AN OVERVIEW OF DIGITAL ART IN SPAIN

By **Rosina Gómez-Baeza**. Director of LABoral Centro de Arte y Creación Industrial, Gijón

Art, Science, Technology and Society: these are the four fundamental pillars upon which rests *banquete_nodos y redes* [*banquet_nodes and nets*], the thirteenth exhibition presented by LABoral since its inauguration merely 14 months ago. That these four fundamentals are also the cornerstones underpinning our activities as an Art and Industrial Creation Centre is no coincidence. LAB was created in order bring art, design, culture, industry and economic development into alliance, as established from the start by the Project Mission that still guides our every step. We are working to make LABoral a place for interaction and dialogue between art, new technologies and industrial creation. We understand that by continually fostering transversality between the most diverse forms of artistic, technical and scientific expressions we will be able to contribute to the dissemination and use of new technological resources, thereby facilitating interrelationships of the visual culture emerging today in Asturias, other communities in Spain and the widest range of countries around the world.

These are interesting times in which we live, as is shown by the ample variety of artistic expressions that this transversality potentiates. Technology has always been of use to art. As a living being, the idea of art has evolved – just as science has done – spurred on by concrete political, social and cultural contexts. Art has always revealed itself as a way to obtain knowledge.

banquete shows this most clearly by offering an overview, a penetrating X-Ray, of digital art in Spain today. With thirty artists and thirty-five art works, curator Karin Ohlenschläger invites us to a profound exploration of that place where experiences and fields of knowledge open up, form connections with one another and converge in the shared pattern of a network that currently characterises our global society.

Collaboration and networking: these are the objectives that animate each and every one of the programmes organised by LAB, as can be seen in some of the data that reflect our activity during the as yet brief existence of the Centro de Arte y Creación Industrial. Since March 2007, LAB has organised thirteen exhibitions featuring two hundred twenty-two art works by three hundred ninety-two artists. We have had remarkable support in carrying out this task: the invaluable collaboration of twenty-five internationally renowned curators. We have also established agreements and collaborative efforts with one hundred museums, centres and cultural institutions around the world. In educational terms, we have organised eight international symposia or conferences, thirty-one professional

workshops and, lastly, twenty-three creation and didactic workshops, intended for young people and their families, in the assumption our responsibility as an educational centre for future generations. Our goal to become a Centre of Production translates today into the thirty-six art works that we have produced. We will also be delving deeply into the research domain with upcoming launch of Creatic, a laboratory of creativity and innovation intended for university students. Our programme has also included the celebration of highly successful concerts and festivals, experimental sessions of video and dance and the bestowal of awards intended to encourage the creation and development of new artistic projects.

It is important to mention that none of this would have been possible without the iron-clad support given to us by our Board of Patrons, to whom I would like to give my thanks for their involvement and support, allowing LAB to consolidate itself as a centre of international relevance in the domain of new *media* art and industrial creation. We are also grateful for the collaboration of the Spanish Government, through the Ministries of Culture, of Industry, Tourism and Trade and of Foreign Affairs and Cooperation.

Of course, I also extend this gratitude and acknowledgement to SEACEX and Fundación Telefónica who, together with LAB, are producing *banquete_nodos y redes* and, further, have made it possible for the exhibition to be shown from March to June 2009 in ZKM, Center for Art and Media in Karlsruhe, Germany. This cooperation clearly demonstrates our shared pledge to increase and consolidate the presence of contemporary Spanish creation in the international marketplace and is a clear sign of the importance of networking -which is also manifest in the support they give to us.

BE A NODE

By **Erich Berger**. Chief Curator. LABoral Centro de Arte y Creación Industrial, Gijón

LABoral Centro de Arte y Creación Industrial is focusing on art which is able to act, speak, question and reflect on contemporary issues within our society and current times, in art which is actively participating in the process of the constitution and survey of the human condition. For this purpose LABoral Centro de Arte y Creación Industrial endorses an extended, open and interdisciplinarity view of visual arts from established practices to new and emerging artistic genres. With this strategy LAB fosters the ability for art to grow, expand and develop, to renew and refine its tools and capabilities for engagement, to be able to work on the contemporary issues of our times.

We have to recognize that technology and science are among the most potent forces transforming life on earth, influencing and shaping our society on every level. The integration of technology and its artefacts in our everyday life has advanced in a way that we perceive its presence as something natural, we live in it and we perceive it as our second nature, a hybrid nature.

Indisputable, the emergence of the electronic communication networks and the accompanying evolvement of a network or information society is one of the most significant recent transformations which happened on a historical timescale within no time. Art and creativity are not excluded from this process. Art always has been omnipresent. As a quintessentially human practice it embraces the world as a whole and is moving and developing with time, permanently producing within a diverse range of practices.

The exhibition *banquette_nodos y redes* is looking into art which explicitly attends to the importance of the concepts of networks, not only on a technical but also on a socio-cultural level. For art to be an active participant in our life it is necessary to update and develop itself, to find ways to express the contemporary and to be able to start a discourse and to lead a critique—it is a question of language. Media art is a form of art which encompasses manifold practices, but it grew out of the understanding that, to be able to act within an technological informed and electronically mediated environment one has to adapt the languages of technology and media itself.

Interestingly, the theory of communication itself offers us a very good picture on how traditional art and media art might differ. The philosopher Pierre Levy summarized the artistic phenomena in the western world in the

following manner[1] that since centuries, a person, the artist, signs an object or a special message, the work of art. The others, public, visitors, critics, perceive it, look at it and read it, interpret, evaluate and criticize it. No matter what the function of the work is, or how deeply it can touch somebody, one thing remains the same, the role of sender and receiver - everybody has his/her place, artist sends, others receive-. What we can observe currently in our network society is the development of new art forms in which this distinction between sender and receiver or producer and interpreter is not valid anymore. It allows the audience which is not an audience anymore to experiment and play with other modalities of communication and configuration. Instead of sending a message to a receiver who is outside of the creative process and who afterwards gives sense and meaning to this work of art, the media artist now creates an environment and structure for production and communication, which includes the receiver into an event of the collective and transmutes the former interpreter into an actor and which interfaces interpretation and collective acting in a loop.

What we can observe in art also happens on the level of society. Network technologies enable us to participate. These technologies are not one-way media like television where we still can see the clear distinction between sender and receiver. Everybody now has the possibility of becoming a node, a crossing for receiving, processing and sending information within the networks.

1 Levy, Pierre: *Collective Intelligence: Mankind's Emerging World in Cyberspace*, Perseus Books 1997

FROM NEURAL PATTERNS TO NETWORK SOCIETY

By Karin **Ohlenschläger** and **Luis Rico.** Idea and concept of *banquete_nodos y redes*

Barely a century separates Ramón y Cajal's discovery of the structure and function of neuronal networks from Manuel Castells theories about *The Rise of the Network Society*. Nonetheless, during that time, things on all levels of society have changed at one of the fastest rates ever. Our dizzying techno-scientific, social and cultural evolution has created a new paradigm based on both the complexity of the multiple realities we operate on simultaneously and the interconnection among processes and events that used to be seen as separate, incompatible or simply incomprehensible. This new scenario is structured as a network of networks, understood as our most advanced tool for interpreting and comprehending the diversity and complexity of contemporary experience. In the late 19th century, for the first time, the brain was able to observe its own neurons and nervous systems in an unprecedented exercise of self reflection. Today, at the beginning of the 21st century, global society is facing the need to think of and build itself based on this new paradigm. The absorbing reality of the Internet influences how we think and act. In fact, we are no longer the same as we used to be. Now we know we are interconnected on all levels of human activity. . Any pretensions at autarchy in the area of knowledge or creation have been gradually rendered obsolete by this new, fluid space we move in. Its very permeability is a new way to understand and construct reality. Through the Internet, identities are increasingly open, creation offers a way to communicate more than ever before, and it all provides a fresh outlook on the human condition. Through the Internet, identities are increasingly open, creation offers a way to communicate more than ever before, and it all provides a fresh outlook on the human condition.

Neurons operate as nodes in the nervous system and global society interacts in a similar manner. The hyper-connected Internet never sleeps, always humming away, and asking us questions. Its answers are always thoughts online. A text being written as it is projected over us all, a story that grows and branches out infinitely, like Borges' gardens and labyrinths. Nobody knows the shape or limits of this living labyrinth but all of us, from individuals to nation states, are aware that we take part in it, generating energy and information flows and, in the best of cases, producing knowledge. It's a Copernican revolution: we've moved from Sartre's "each man for himself" to Internet theorists' "person-as-node". Thus, just as the same information flows through all our cells, a universal story is created by our social and cultural interconnections, which we are actively creating

at every moment. There is no place for isolated stories in this forum where art, philosophy, literature and science are constantly engaged in dialogue, not only with and for themselves, but among each other and for all.
Being a citizen today means being part of a highly dynamic, changing system where huge flows of energy, matter, and knowledge are moving incessantly. Exploring our world is once again an adventure, where the image of a neural network, just as shown by Cajal, has grown and become the paradigm of Internet.

Banquete_nodos y redes (*banquet_nodes and networks*) grew out of this theoretical and practical need to research the new conditions of the Network Society and the flowing space that define the globalized world of the 21st century. In this context, the model of cultural production that has prevailed up until now, always based on a dominant center and unquestionable axes, has yielded to a new structure with multiple nodes and networks. This structure is characterized by its constant flow of information and exchanges, as well as by interaction, connected dialogue within a network where each point is a node, an outlook and a story. In short, we are talking about a new system of cultural production and transmission. It is multi-centered, dynamic, and horizontal, acting in an interconnected and interdependent way. It is an expansive system where ideas and concepts, as well as subjects, entities and institutions are all agents and catalysts for the process of cultural transformation.

BANQUET_NODES AND NETWORKS (*BANQUETE_NODOS Y REDES*) INTERACTIONS AMONG ART-SCIENCE-TECHNOLOGY-SOCIETY IN SPAIN'S DIGITAL CULTURE

By **Karin Ohlenschläger**. Exhibition's Curator

One of the outstanding discoveries of Santiago Ramón y Cajal (1852-1934) was that neural networks are not the closed, continuous circuits his contemporaries believed them to be.[2]. Cajal defined each nerve cell as a unit, connected to others through contact or adjacency. Therefore, neural networks are open, changing systems with temporary or permanent connections, depending on the intensity of the stimuli received. Their networks can grow in one direction and atrophy in another, producing new branches and generating other links that are pre-determined by genes, modulated by the internal hormonal system, and driven by external stimuli and movements. Cajal discovered these dynamic and evolving constructions of the brain, in spite of having only primitive scientific visualization technology available at that time, such as the selective staining and the microscope.

A century later, our knowledge of network dynamics is no longer limited to neural circuits. Today's information and telecommunications technologies have made us see that *life as a continuum is a process whose movement began millions of years ago and continues onward. And all thanks to networks*. [3] Today, the fabric of relationships –that is a web in itself- can be observed on both large and small space-time scales. Like neural circuits –as Cajal knew- the organizational networks among atoms and molecules are constantly changing[4], as are networks of relations among persons, communities and cultures.[5] The network pattern, present at all levels and spheres of life, organizes its parts in an open, dynamic, self-organized and evolving system. From water molecules to the World Wide Web, this organizational pattern runs throughout the continuum inhabited by life.

However, as members of societies undergoing techno-scientific development, we are faced with a significant change: current information technologies allow us not only to access networks but also to generate

[2] Javier DeFelipe, *Cajal and Neural Circuits,* (See accompanying excerpt).
[3] Diego Rasskin-Gutman and Ángela B.Buscalioni, *Networks, the Vital Principle* (See accompanying excerpt)
[4] Carlos Briones, Susanna C. Manrubia and José Angel Martín-Gago *Networks in the Nanoworld*, (See accompanying excerpt)
[5] Carlos Briones, Susanna C. Manrubia and José Ángel Martín-Gago, *Lenguaje, genealogía y herencia. La construcción de las redes sociales* (See accompanying excerpt)

them. In the radio and television era, production and distribution were still based on dominant centers and distribution channels from the few to the many (*broadcasting*). Since the late 20th century, via mobile telephones and the Internet, we have built networks of one-to-one relations (*peer-to-peer*) on a space-time scale - over distances and at speeds- without precedent in the entire history of humanity. In his extensive research and analysis on the Information Age, Manuel Castells reached the conclusion that networks (...) *constitute the new social morphology of our societies, and the diffusion of how their links are created substantially modifies the operation and results of production processes, experience, power and culture.*[6]

Given that technological systems are produced socially and that this social production is determined by culture, in the current Digital Era, culture is increasingly defined by a renewed network of transdisciplinary interactions among the arts, the sciences, technologies and societies. Today, the production of images, the collective imagination and discourse are equally in the hands of science, the audiovisual sector, and citizens themselves. Any user of the mobile telephone, the digital camera, the computer or Internet is also a potential producer and broadcaster of discourse, images and knowledge.

In fact, part of the projects exhibited in *banquet_nodes and networks* are fed by the Internet, the huge archive of our collective memory. Others arise from the collaboration between artists and scientific research centers, or artists and citizens. Some participants have been trained as architects, computer scientists, engineers or musicians; or they work collectively with activists, biologists, sociologists or urban planners.

That is because *banquet_nodes and networks* ventures into precisely those areas where closed borders and divisions between experiences and fields of knowledge are opened and reconnected. These are areas where identities and information are decontextualized and reconfigured in a way we cannot apply traditional methods of analysis any more. In fact, as things stand today, we are still lacking a science of information understood as *epistéme,* able to conceptually integrate the diversity of informational sources and processes. The construction and perception of reality is no longer carried out exclusively–as we mentioned before- at the centers and axes of dominant powers. With the current information and telecommunications technologies, other structures have emerged: new spaces for communication and relations among experience and knowledge that nourish multiples and collective dynamics.

The projects comprising this *banquet_nodes and networks* exhibition explore, visualize, or generate these networks of relationships at the frontiers between art, science, technology and society; between physical and virtual spaces; between urban and social networks; between the

[6] Manuel Castells, *La era de la información (The Information Age: Economy, Society and Culture), Vol.1, La sociedad red (The Network Society*), Alianza Editorial, p.549 (See accompanying excerpt)

commons and informational dynamics; between biological and technological connections:

-The emerging connections between physical and virtual spaces, territorial networks, local environments and their interdependence with global dynamics are investigated and visualized in different ways by the following artists or groups: Hackitectura, Escoitar, Influenza, Kònic Thtr, Clara Boj and Diego Díaz, and Pedro Ortuño.

-The relationship between social and urban dynamics; the creation of new participatory methods and tools to serve as catalysts for processes of self-organization, production, and distribution of experiences and knowledge are proposed by Antoni Abad, Alfredo Colunga, and groups such as Platoniq or Neokinok TV. Marta de Gonzalo and Publio Pérez Prieto's project is about the ideological, conceptual and functional relationships between education, creativity and life.

-Informational networks are the subject of the works by Aetherbits, Dora García, Concha Jerez and José Iges, or Joan Fontcuberta. The question of authorship, originality, and veracity is posed by some of their works; others look at new links among current artistic practices and their relation to other citizens, micro-producers and distributors of experience and knowledge online and on-site. The open source network culture is part of the project by Joan Leandre, Technologies To The People and Daniel García Andújar.

-Links between biosphere and infosphere, given that the *infosphere* and its networks of codes and languages are not only found in the field of information and telecommunication technology. Our biosphere is also an *infosphere,* and life itself is a network of communication and the transformation of matter, energy and information. In this field, we show projects that significantly broaden the art-life discourse toward the micro-spheres of cellular nodes and networks, or toward the hybrid macro-environments of the body-machine connection. The works and interactive installations by Eugenio Ampudia, Marcel.lí Antúnez, Pablo Armesto, José Manuel Berenguer, Daniel Canogar, Álvaro Castro, Ricardo Iglesias, Laboratorio de Luz, Marina Núñez or Raquel Parício and J. Manuel Moreno explore new modalities of conception, perception, and interaction between living and technological systems.

A GUIDED TOUR THROUGH THE EXHIBITION AT LABORAL

Banquet_nodes and networks brings together over 30 projects that address a set of critical reflections and participatory experiences which investigate this new common pattern of the network. Digital photography, videos, virtual reality installations, artificial life robotic performance, or participatory *net.art* projects offer a broad overview, taking us from networks of interactions among genes or software codes to the global dynamics arising from new relations among persons, communities and cultures.

Visitors to the exhibition starts with territorial and urban networks, where they can investigate a series of projects that take an open and plural approach to the new dynamics of collective selforganization. The **Hackitectura** group is presenting two works connecting the virtual environment of networks with the physical space of places. Their architectural urban project, *Wikiplaza*, transforms a place of bricks and concrete into an open space permeable to communication flows. Videos of the *Geografías emergentes* workshop portray the successful experience of coexistence and collaborations between artists, architects, open source developers and the inhabitants of a rural area of Extremadura, in a temporary laboratory installed in the area outside a dismantled nuclear power plant.

The city becomes a source of information and raw material for the creation of soundscapes in the production workshop *Aire, sonido y poder (Air, Sound and Power)* offered by the **Escoitar** group in the weeks prior to the opening of the exhibition at LABoral. They invite the inhabitants of Gijón to explore their urban environment and to generate collectively an interactive and participatory sound map of the city, which will be accessible to exhibition visitors, and available online to Internet users.

In *Observatorio*, **Clara Boj and Diego Díaz** apply augmented reality devices to visualize nodes of free access to wi-fi networks in the city. The close links between urban space and virtual communication connections also serve as the conceptual base for the interactive installation titled *Madrid Mousaic* by the **Influenza** group. Their work is a living, changing mosaic that portrays quite diverse social environments in Madrid and is sensitive to the sound intervention of visitors to the exhibit space at LABoral.

Incessant migratory flows and their influences on individual and group identities in an increasingly interconnected and interdependent world is what the interactive installation *Mur.muros/ Distopías II* by the **Kònic Thtr** group invites visitors to experience.

In *Terra di nessuno: Arenas Movedizas*, Concha Jerez and José Iges confront the user of their interactive installation with the uncertainties, tensions and conflicts generated on a virtual Parcheesi board where certain squares sink the player into the shifting sands of global information networks.

To stimulate the self-organization of new social links, **Antoni Abad** has been developing his artistic projects under the common denominator of *zexe.net*. Its concept is based on an operative system for mobile telephones and the Internet to serve the most marginal populations in urban settings. Two of his recent experiences, *Canal*Motoboy* and *Geneve*Accessible*, carried out with motorcyclists in Sao Paulo and the disabled in Geneva, are examples of how the visibility, self-management and self-determination of urban groups can be fostered by current artistic practices, using communication networks.

Direct participation in collective indexing of all kinds of knowledge, whether a recipe, a software application, or a relaxation course, is the subject addressed by the **Platoniq** group in *Banco Común de Conocimiento (BCC)*. It is a platform for exchanging experiences and knowledge and for connecting everyday oral culture with online digital communication networks that lie outside commercial, speculative circles. *BCC* is also a laboratory for experiencing new forms of production, learning, and citizen participation.

The **Neokinok TV** group works on creating educational tools and methods, generating communication networks and links to foster self-determination among those persons most disadvantaged by the growing digital gap. One of their most recent projects, called *Tvlata,* joins art to education to create an experimental online television channel with a group of young people in Los Alagados, a peripheral neighborhood of Salvador do Bahía, Brazil.

La intención is another artistic project linking art and education. This video installation by **Marta de Gonzalo and Publio Pérez Prieto** is a critical review of certain educational principles increasingly tied to the discourse of efficiency, competitiveness, and profitability. As an alternative, they offer an audiovisual education program that aims to restructure ideological, conceptual, and functional relations among education, creativity, and life.

Todas las historias is a pioneering work of micro-stories in blog format, conceived by **Dora García** as a *work in progress*. Since 2001 this project has continued to publish short stories about anonymous men and women, experiences, feelings and events interconnected by dates and keywords on the Internet.

In contrast, **Pedro Ortuño's** *Blanca sobre Negra* takes a look at rural lives, at people whose isolation, poverty, precarious employment and existential uncertainty is is increasing as fast as connectivity and wealth is growing for others.

The *Googlegrams Ozono* and *Prestig*E by **Joan Fontcuberta** use images tracked by an Internet search engine to visualize the new iconographies of a collective memory that is increasingly globalized, interconnected and interdependent.

E-day for energy, an Internet project by **Alfredo Colunga,** invites us to reflect individually and act collectively to support new energy sources for a planet with limited resources.

In *Social Synthesizer_Prototype*, by the **Aetherbits** group, calls received on a Skype Answering Machine are transformed into a collective composition of images and sounds that are fed back and evolve constantly, with participation by the visitors of the exhibition or Internet users.

The political, social, economic, and cultural implications of free distributed software on the one hand and centralized proprietary software on the other, form part of two settings and two narratives that make up the complete installation *X-devian* by **Technologies To The People** and **Daniel García Andujar**. This project stresses the cultural controversy about software, which some see as a product and others as an open and participatory process.

Joan Leandre offers a tribute in his installation *nostalG2//L'AGE D'OR NFO.EXE* to the seminal rituals and protocols of digital contamination; a global dataflow that no node can stop; an ambivalent network, both creative and destructive.

As mentioned above, the biosphere is also an *infosphere* comprising the network of codes, protocols, biochemical languages, and electric impulses. Among the works related to neural networks, **Águeda Simó** presents her virtual-reality installation, *Reflecting JCC Brain Research II*, which invites us to explore the mind, memory, and turbulent emotional life of a person with mental illness.

Minds connected to a playful, intuitive communication system called *Tecura 4.0* are the theme of the work by **Evru.** In this *net.art* project, the artist turns his own visual and sound language into an open source system that he shares with Internet users.

The video installation *Reina* by **Francisco Ruiz de Infante**, in contrast, leads us to disturbing reflections on neural networks and spaces connected via delocalized, omnipresent control systems with restricted access.

Complex systems are the subject of *Vacuum Virtual Machine* by young architect **Álvaro Castro.** Through artificial life graphics software, it visualizes the changing reticular self-organization of atoms and molecules. This project gives a visual form to the network as the structural, dynamic, and evolving basis for life.

The research project *POEtic Cubes* by **Raquel Paricio** and **J. Manuel Moreno** draws its inspiration from cellular communication networks, represented by nine luminous robotic cubes that behave as a sole artificial organism. Each robotic cell changes its behavior and relations through the process of interaction among all parts of the system -including the audience at their performances -illuminating a communication network that simultaneously includes robots and humans.

The version of the series of *Secuencias 24* by **Pablo Armesto** transforms the recombinatory relations of 48 chromosomes on luminous screens made of fiber optics. This work refers to the vast number of combinatory relations of the code of life, still beyond our grasp. The interactive installation *Luci. Sin nombre y sin memoria* by **José Manuel Berenguer** invites us to explore a network of luminous and sound interactions

inspired by the behavior of fireflies.

Modulador de luz 3.0 by the **Laboratorio de Luz** research group turns the exhibition visitor into the protagonist who explores and experiences the light-space-time / reflection-shadow-movement relation to generate new time, space, and sound combinations.

Communication links between users and machines become disturbing in *José, un robot autista* by **Ricardo Iglesias**. This project is part of his series of investigations about *Evolutional Machines.* In this case, he turns a meek robotic vacuum cleaner into an animated machine with dysfunctional behavior dictated by fear and autism. Interacting with this poorly adapted robot is an unusual experience for those accustomed to the servile machines in our everyday surroundings.

The relationship between humans and machines is also the central theme of **Marcel.lí Antúnez**´s *Protomembrana*, an interactive, visual and sound lesson on *systemplaywriting* –literally, playwriting for computational systems- which serves to weave a tale brimming with fables.

Satellite dishes, radars and other devices used in global communication networks give mobility to bodies floating in space, with which **Marina Núñez** is referring to the contemporary myth of the Cyborg, half man and half machine, a ubiquitous, weightless, "tele-present" digital being with expanded fields of action and perception.

In contrast, in one of the mural photos of the series *Otras Geologías* by **Daniel Canogar**, several human bodies appear as half-buried waste in an impassable tangle of debris made up of wires and computer equipment. His installation *Tangle* is a reflection on how technologies create complex emotional connections that unite yet at once confine the contemporary being. Across from this works, the visitor finds *Crédulos*, an interactive installation by **Eugenio Ampudia** where the user discovers other levels of existence, by experiencing a certain perceptive disorientation upon seeing him or herself projected as a tiny being surrounded by gigantic amoebas who respond to his or her presence in real-time.

This overview of the *banquet_nodes and networks* exhibition invites us to experience the emerging connections between living and technological systems. These connections are present not only in science, art, or our everyday environments, but also in the continuum of discontinuous, open and variable connections that make up a life and the relations among the parts. The network paradigm, which links the microscopic, the macroscopic, the biological, the social, and the cultural is explored in a plural and diverse way by all the exhibition participants. These works show the intense and fertile synergy established on the frontiers between art, science, technology and society in the current digital culture in Spain.

Aetherbits
Social Synthesizer_Prototype, 2008
Interactive online and on-site audiovisual project
Social Synthesizer examines and researches into the application of sound synthesis techniques for processing databases of audiovisual input from interactive computer networks with user-generated content (computer networks with an architecture of collective participation and social networking). Online music composition is the audio and data engine of *Social Synthesizer_Prototype* conceived as an audiovisual polyphonic synthesizer, the algorithmic music composition outputs sound functioning as data used by the software to process images. This audiovisual synthesizer prototype processes a flow of pictures in real time from Flickr. Using images from an archetypal social network such as Flickr, a sharing application with user-generated content of personal images, this audiovisual synthesizer allows us to create a collective artwork emerging from a global user community.

Aetherbits is an international new media artist collective comprising Mariela Cádiz (Spain), Kent Clelland (USA) and Denis Lelong (France). Their online collaborative platform is http://aetherbits.net
Cádiz, Clelland and Lelong met in 1994 while studying at California Institute of the Arts / CalArts (USA), since then they have collaborated regularly. Their works range from award winning computer animation films to interactive installations, live cinema performances and compositions for new media.
Mariela Cádiz studied Fine Arts in Madrid (Spain) and Denis Lelong studied metal sculpture in Paris (France). They both specialized in new technologies for visual media at CalArts. They currently live in France and work in new media. Computer musician Kent Clelland studied saxophone performance, music theory, and composition as a prelude to his Masters at CalArts in Composition for Interactive Media. He's currently living in Germany, designing tactile performance software for audio and video.
http://www.aetherbits.net

Abad, Antoni
GENEVE *accessible, 2008
canal *MOTOBOY, 2007/08
Installation. Variable dimensions
www.zexe.net/GENEVE / www.zexe.net/SAOPAULO
GENEVE *Accessible & canal *MOTOBOY. www.zexe.net is a project focused since 2003 on the creation of digital communities through the use of mobile phones with built-in cameras. The immediate dissemination capability in Internet of audiovisual footage recorded with these mobile devices, make them the loudspeakers of some collectives lacking an active presence within the mainstream mass media. Using mobile phones, some specific collectives have an opportunity both to build their own communication network and a map of their urban geopolitics. In *GENEVE accessible*, 40 disabled people from the city of Geneva take pictures of the

obstacles of the city with their mobile phones. Photos are then uploaded onto Internet and draw a multimedia map of the in/accessibility of the city. *Canal *MOTOBOY* also uses the Web as a communication tool, but in this case the reporters of experiences and environments are motorcycle couriers from Sao Paulo, generating in Internet a new mode of collective awareness and knowledge. Communication networks and urban networks are superimposed, connected and complementary within the same pattern of collective intelligence.

Antoni Abad (Lleida, 1956) lives in Barcelona. A multimedia artist and graduate in the History of Art from the University of Barcelona, Abad works in the field of sculpture, installation and net.art, using in his practice the new resources offered by digital technology. He was awarded a Golden Nica at the 2006 Ars Electronica Festival in the category of digital communities. In 1999, he won the ARCO Electrónico award with his piece *1.000.000*. His projects have been exhibited at the Museu d'Art Contemporani (MACBA), Barcelona; Museo Nacional Centro de Arte Reina Sofía (MNCARS), Madrid; P.S.1., Long Island City, New York; Hamburger Bahnhof; Museo de Arte Moderno de Buenos Aires; ZKM'net_condition, Karlsruhe; and Dapertutto/ Venice Biennale, among other venues.

Eugenio Ampudia

Crédulos *(Credulous)*, 2002
Interactive installation

By Courtesy: Titto Ferreira Collection

Crédulos. A space equipped with computer terminals and furniture, acting as a resting place and Internet access point, while ceiling projections cover the floor with images of amoebas wandering freely around the environment interacting with visitors. A ceiling-mounted camera captures images of this living space, providing an overview of what is going on inside this space: the pieces of furniture form the word *Crédulos* (*Credulous*) and visitors discover a different scale of their existence. Their presence is part of a weave of relationships with microbial worlds coexisting on the same level as the human scale and global networks of communication. Although physically we feel bigger within this environment, when looking at the digital networks our experience is of extremely small and insignificant beings. *Crédulos* recalls a state of uncertainty, a change of perception when seeing ourselves immersed in a network of relationships simultaneously interacting at very different space-time scales.

Eugenio Ampudia (Valladolid, 1958) lives and works in Madrid. Painter, sculptor, multimedia artist and exhibition curator, Ampudia studied at the School of Arts and Crafts in Zaragoza. Stripped from all things superfluous, his practice, rendered across many different media, questions the beholder about notions silently pervading the everyday. Ampudia's works have been seen at the Singapore and Caracas biennials (2006), and gone on display at Kunstverein, Copenhagen and LABoral, Gijon (2007); Artium of Vitoria, Museo Pablo Serrano of Zaragoza, and Project Room in Cologne (2006); and the Museo Nacional Centro de Arte Reina Sofía (MNCARS), Madrid (2004), Fundación Pilar y Joan Miró, Palma de Mallorca (1994), among others.

http://www.eugenioampudia.net

Technologies To The People/Daniel G. Andújar

***X-devian*, *The New Technologies To The People System*,** 2003
Interactive installation
Workshop

http://www.x-devian.com

X-devian. More than a question of programming, software is one of the most powerful tools of culture production in our times. With the slogan "access to technology is a human right" the installation and laboratory project by *X-Devian* takes us to the controversial world of free and proprietary software culture. Political, social, economic and cultural implications of free distributed software, on one hand, and centralised proprietary software, on the other, become part of two scenarios and two narratives making up a whole installation which combines reality and fiction, expectations and speculation. *X-devian* presents us with a mirror image of our own knowledge and ignorance with a view to increasing our attention and inviting the audience to become aware of current interests and the techno-economic and cultural dynamics of the world today.

Under the usual marketing rhetoric, plenty of logotypes and slogans, *X-devian* presents its software, on one hand, as a pure commercial product, whilst in the laboratory hidden behind the advertising scenario, the audience can experience and understand *X-devian's* software as an open, evolving and participative process where the citizen decides what to do with its technological environment.

Daniel García Andújar (Almoradí, 1966) lives and works in Barcelona. A multimedia artist, García Andújar began his art practice in the late 1980s, in the field of video art. A member of Irrational.org, in 1996 he founded the *Technologies To The People* (*TTTP*) project. Andújar explores concepts such as virtuality, authenticity, copyright, marketing strategies, relationship between media and power, as well as global access to the technological communication networks. His projects have been presented, among other venues, at Hartware MedienKunstVerein, PHOENIX Halle Dortmund; CCA Glasgow; PhotoEspaña2006, Matadero Madrid; Palau de la Virreina, Barcelona (2006); Manifiesta 4, Frankfurt (2002); ZKM, Karlsruhe; George Pompidou, Paris; Transmediale 01, Berlin (2001); Microwave Festival, Hong Kong; Portland Art Museum, USA (2000); ICA, London (1999); and Apex Art CP, New York (1998).

http://www.danielandujar.org

Marcel.lí Antúnez

***Protomembrana** (Protomembrane),* 2006
Video of interactive performance, 40 min.

Protomembrana is a theoretical and practical lesson on *systemturgy* (a compound of the words dramaturgy and computational systems). Using words, music and animated graphics as a multimedia whole controlled by interfaces, Marcel.li Antúnez organizes this action simultaneously as both performance and interactive conference. Together with the spoken narration of Marcel.li himself, computers, projections and pictures of the public taken through a gun-camera, interweave a narration under continuous construction.

Looking, on one hand, at cybernetics and communication issues between

machines and bodies, and on the other hand, at *connective* thinking modes, *Protomembrana*, focuses on the new narrativity plots underpinning network society. A framework of non-linear linguistic structures with feedback loops which can organise their own communication flow from audiovisual media. A textuality that is more autopoiesis than digital. A new form of telling, knowing and, consequently, of thinking about what is at stake in the transit to the new psychodynamics of digital culture.

Marcel.lí Antúnez Roca (Moià, Barcelona, 1959) lives in Barcelona. Multimedia artist and graduate in Fine Arts from the University of Barcelona. In the early 1980s, he was a founding member of the collective La Fura dels Baus. He gradually became detached from the group during the 1990s and began his solo work. Since 1994, the use of technology has acquired key importance in his practice, in which he tackles subject matters as timeless as affection, identity, scatology or death. His work has been seen at the Seoul Performing Arts Centre, Korea; Ars Electronica, Linz, Austria (2003); Cena Contemporánea, Rio de Janeiro, Brazil (1997); ICA London, UK (1996); and EMAF, Osnabrück, Germany (1995), among others.

http://www.marceliantunez.com

Pablo Armesto

Secuencias 24 *(Sequences 24)*, 2005/08

Installation. 24 panels fibreglass. Approx. 2.2m x 12m

Secuencias 24. . This installation offers a real environment of *augmented reality*, standing next to large scale chromosomes measuring in excess of two metres high. A series of 24 panels, representing each of the human chromosomes, is arranged on the wall and features colourful beams of lights, allowing a kind of visual synthesizing of the genome map.

The changing lights intuitively convey the complexity of the genome sequencing and the information network of which we are made as organisms. Entering this over-scaled environment is not only a recreation or staging of displayed data, of the written code we are made of; but also an immersion into the molecular network forming us as a system of changing information. Life schematised as a continuous flow of codes and a non-linear system of reciprocal relationships: the key of life presented as light.

Pablo Armesto (Schaffhausen, Switzerland, 1970) lives and works in Gijon. Visual Artist, he has a Diploma in Illustration and Design from the School of Fine Arts of Gijón. Trained in the field of the image, his work has been evolving towards installation and public art, a domain where he looks for interactivity between the medium and the user. In his pieces, Armesto explores and thematises critical issues of networks, displacements and the very concept of space. He has won several distinctions, including the Jovellanos (2006) and Alnorte (2005) grants. His work was included in a touring show on Visual Arts from the Principality of Asturias, presented in Salamanca, Madrid and Brussels, (2006); and Lorient, France (2005).

José Manuel Berenguer

Luci. Sin nombre y sin memoria *(Luci.without name and without memory)*, 2008

Interactive Installation

By Courtesy: Beep-Data Logic Collection

http://www.res-qualia.net/view_projecte.php?id=647

Luci. Sin nombre y sin memoria is an interactive installation which invites one to explore a network of sound and light interactions inspired by the real behaviour of fireflies. The work comprises 60 electronic devices and 128 computational artefacts. When the environmental light is intense, electronic devices start to beat independently. But when the amount of light drops below a specific limit (particularly when infrared signals can be captured by neighbouring receivers), the system tends to become stable, resulting in wide areas with artefacts beating in synchrony. Computational agents, lacking in individual name and memory, mimic this behaviour and project it on a dihedron located opposite the electronic devices. Taken from the individual behaviour of the latter, *Luci* is nothing more than an unexpected emergency exploring the complex behaviour resulting from the combination of very simple elements.

José Manuel Berenguer (Barcelona, 1955) lives and works in Barcelona. Conductor of Orquesta del Caos and Director of Festival Música13, founder of NauCôclea, a member of the Académie Internationale de Musique Eléctroacoustique of Bourges and Honorary President of the International Confederation of Electroacoustic Music of the UNESCO International Music Council, José Manuel Berenguer has earned many international distinctions awarded by institutions like Internationale Ferienkurse, Darmstadt; Gaudeamus Foundation; Prix de Musique Eléctroacoustique, Bourges; Concorso di Musica Elettronica. Fondazione Russolo-Pratella; International Rostrum of Electroacoustic Music of CIM-UNESCO; Festival de Músiques Contemporànies of Barcelona; Rádio Nacional de España; Castilla-La Mancha Video Award; 2008 ARCO/Beep Electronic Art Award. His practice focuses on installation, real time and interactivity, addressing issues like philosophy and history of science, the limits of language, ethics, artificial life and intelligence, robotics, information metabolism, as well as the very limits of human understanding and perception.

http://www.sonoscop.net/jmb/

Clara Boj & Diego Díaz

Observatorio *(Observatory),* 2008

Mobile installation, tracking tower, video screen, display (variable dimensions).

This device is placed in the Old Universidad Laboral Tower

Observatorio is a surveillance device consisting of an antenna and a video camera tracking available and open wireless networks in the outdoor urban space. This scanning urban tower includes a periscope allowing the user to watch those networks detected in real time appearing as images visually superimposed over the image of the city map. At the same time, in the exhibition space, a video projection shows this image of current networks, plus the ideal possible re-configuration of the same.

The configuration of networks (whether they are open or closed, limited or

unlimited) represents a significant social map in a society where citizens are determined and developed in relation with their access (to richness, information and services). The concept itself of access, connectivity, their constraints and distribution in space are highlighted and studied in *Observatorio* as emerging concepts necessary for a proper understanding of new social distributions and locations of power.

Clara Boj and **Diego Díaz** (Murcia, 1975) live and work in Valencia. A two-artist collective created in 2000. Clara Boj has a PhD in Fine Arts while Diego Díaz has a BA in Fine Arts both from the Polytechnic University of Valencia. They combine their art practice with wide-ranging research into the field of interactive environments, urban strategies, and network experiences, connecting physical and digital spaces and generating ongoing links between traditional and innovative forms of social interaction. They have been artists-in-residence at the Mixed Reality Lab, National University of Singapore, and their work has been exhibited at the Singapore Art Museum; Lonja del Pescado, Alicante, Spain; MediaLabMadrid; and Kiasma Museum, Helsinki, among others.
http://www.lalalab.org

Daniel Canogar
Tangle, 2008
Installation with projector. Variable dimensions
Tangle. A tangle of cables scattered in the exhibition space and ends up covering the walls and ceilings with unsettling images. The artist uses these delicates structures as a metaphor to reflect on the networks of our information society. In *Tangle* the woven spider web has been replaced by electrical cords, phone wires and computer cables found in rubbish dumps and junkyards all over the city of Madrid, further confirmation of the artist's ongoing interest in electronic rubbish and the excesses of the consumer society. The spider webs created by Daniel Canogar refer continuously to the movie screen. The flickering movie projection is captured by the screen surface in a similar way that an insect is trapped by a spider's web. Membranes made of technological cables have an almost textile touch, where the technological almost seems to mimic the biological. Above all, this piece is a reflection on how technologies create complex emotional connections that unite yet at once bind the contemporary being.

Daniel Canogar
Otras Geologías 9 *(Other geologies 9)*, 2005
Digital photography, variable dimensions
Otras Geologías 9. A large-scale photograph covering the whole wall shows a tangle of elements that could well be seen as a metaphor of communication society and of its most conspicuous offspring: the network society. The whole space is jam-packed with piles of cables, hardware apparatus and technological artefacts trapping human bodies. These "waste" materials comprising potential communicational rubbish co-opt human bodies as yet more waste. However, from a more critical perspective, the roles of subject and object can be interchanged so that ultimately we are unable to distinguish between the passive waste object

and the active subject. Man and artefacts, without distinction and even simultaneously, can be viewed as waste material in the same digital cartography; or simply, human bodies can work as mere nodes in a technological communication network.

Daniel Canogar (Madrid, 1964) lives and works in Madrid. He is a graduate in Visual Communications from the Universidad Complutense in Madrid. His photographs suggest a subversion of the traditional parameters of the role of the spectator, involving him/her in the very configuration of the work. Canogar tackles the big concepts of 21st century societies: the baroque nature of the electronic medium, the surplus of information or the society of the spectacle. His work has been exhibited at Photosynthetic Remembrance, Galeria Filomena Soares, Lisbon (2006); La Panera, Lleida (2005); Art + Public, Geneva (2004); Cairo Biennial; European Media Arts Festival, Osnabrück, Germany (2003); Oboro, Montreal (2000); Offenes Kulturhaus, Center for Contemporary Arts, Linz (1999); Espace d'Art Yvonamor Palix, Paris; Centre d'Art Contemporain de Basse Normandie; and Axe Neo-7, Quebec (1996).

http://www.danielcanogar.com

Álvaro Castro

Vacuum Virtual Machine, 2008

Software art installation, plasma screen, CPU, variable dimensions

In collaboration with Next Limit Technologies

Vacuum Virtual Machine. Different and changing shapes flow on a screen. What apparently seem like simple random, strictly plastic, configurations are actually 3D graphics displaying data observable by the visitors during its evolving process. However, these graphics are the external expression, the auto-mapping, of a virtual machine. Approaching the concept of artificial intelligence, this artefact without a physical existence works continuously to develop codes in order to change itself. This virtual machine breaks with the separation between hardware and software, operating in a cellular, autopoiesic and non-sequential way. The software created by Álvaro Castro is a generative model for the visualisation of complex behaviours through a simple interface. Adopting the appearance of membranes and tissues, the user finds a three-dimensional and synthetic understanding of the self-organization of living systems. Approaching these visual synthesis allows us to –intuitively- grasp the enormous complexity of the dynamic patterns of network systems -both neuronal or social- and their changing architectures.

Álvaro Castro Castilla (1983, Córdoba) lives and works in Madrid. A researcher and architect trained in computing languages and in the study of space, Castro's work focuses on the wider spectrum field of architecture and in the generation of visual solutions for urban environments and non-linear systems. At present, he is collaborating with the R&D division of Nextlimit Technologies. His work has been presented at the Ars Electronica Festival, MediaLabMadrid-Centro Cultural Conde Duque (2006), and CAB, Burgos (2004).

http://www.alvarocastro.es

Alfredo Colunga

El día E de la energía *(E-day for energy)*, 2008
Net.art, online collaborative project
www.edayforenergy.org

El día E de la energía. Networks need energy in order to operate properly. If there is enough energy available, then each node operates independently and the network is horizontal and democratic. If energy availability is restricted, then this situation tends to transform the network into a pyramid. Therefore, the only possibility of growing for nodes or companies is to take over others. This rapidly results in a concentration of resources. Apart from fossilized fuels, this also happens with raw materials, as well as with products directly obtained from raw materials. This will lead us to a world where only a few are the owners of the goods indispensable for everyone. The only possibility of reversing this tendency is finding new forms of energy, sufficiently abundant that we compete again for its use and not for its ownership. *El Día E de la Energía* is a proposal for a crucial pact. A necessary agreement between tomorrow's energy producers and today's energy owners.

Alfredo Colunga (Oviedo, 1963) lives and works in Oviedo. This multimedia artist studied technical engineering at the University of Oviedo, and has also studied History, Philosophy and Audiovisual Language. Literary experimentation, the research of new audiovisual media and processes and the development of a systemic perspective of reality, are some of the conceptual driving forces in Colunga's current practice. In recent years, he has taken part in the Big Social Game International Art Biennale (Turin, 2002), in the Transhumanism and Bioethics Conference (Yale University, 2004); and has exhibited his work at Galería Vértice (Oviedo, 2005), among other venues. In 2007 he presented the audiovisual piece *La palabra que falta* at the Gijon Film Festival. He has authored and directed over 60 scientific and didactic audiovisual pieces and patented a number of audiovisual processes.
http://www.alfredocolunga.com

Escoitar

Aire, sonido y poder (Tecnologías de control social con sonido de Gijón: una cartografía) *(Air, sound and power. Technologies of social control with sound in Gijón: a map)*, 2008
Interactive installation, monitor, CPU, Internet access, display
Workshop from 26th to 30th May

Aire, Sonido y Poder (Tecnologías de Control social con sonido en Gijón: una cartografía) is a critical, open and participative project, once a production workshop and an installation. As a workshop it is focused on so-called "technologies of social control" using sound or music in order to exert power, influence and control and to attack or protect oneself (such as acoustic guns). As an interactive installation this work offers a public tool adopting a cartography format where some of these social control devices with sound can be geolocalized in the city of Gijon. Using a self-produced *plug-in* called "GIS" -CMS Spip- and through the installation, the user can navigate its maps looking for the places where sounds were

recorded. Simultaneously, this specifically created software automatically locates latitude and longitude coordinates so that Internet users can locate themselves by clicking and listen to the recorded sound. This specific software allows us to build the collaborative construction of a social soundscape of the power technologies we are ascribed to.

Escoitar. A collective of sound artists and activists, Escoitar is made up by Carlos Suárez Sánchez, Julio Gómez, Juan Gil Rodríguez, Horacio González, Chiu Longuina and Bernio Molina. Anthropologists, musicologists, fine art graduates or multimedia artists, the work of Escoitar members focuses on sound, sound memory and the ethical engagement of cultural action. They develop their activity online using open source as a key concept for social activation. They have recently created an interactive sound map of Galicia offering telematic access to the sounds of the landscape and to the life of a specific geographic area.
www.escoitar.org

Evru
Tecura 4.0, 2008
Net.art and wokshop

Tecura 4.0 is an interactive application for visual and sound creation in Internet. Indeed, it is more than this; it is a factory of images and sounds with in excess of thirty creation and communication tools designed by Evru. Each graphic comes with a specific sound in synchrony with hand movements. This interface allows any visitor to easily produce his/her own work using the backgrounds created by Evru, and subsequently to print, send via Internet or save the work in the *Tecura* online archive.

Here the artist becomes a meta-artist establishing a symbiotic connection with the user, and simultaneously presenting a didactic and therapeutic tool through art. By making his own visual and sound language available to Internet users, Evru is offering an open source that encourages and generates a shared process of creation. After all, a mental connectivity can emerge from an artistic -playful and intuitive- coparticipation.

Evru (Barcelona, 1946) lives and works in Barcelona. He is one of the first digital artists in Spain. In 1968, the artist Albert Porta transformed himself into Zush and later, with the arrival of the new millennium, into Evru. In 1975, a scholarship from the Juan March Foundation allowed him to study holography at M.I.T., Boston. In the 1980s he began to apply digital technology to his work. His practice is based on a concept he has coined himself as *PsicoManualDigital*. He has exhibited his works in major retrospective shows, including The Art of Today Museum, Beijing (2007), MACBA (2001), or MNCARS (2000). In 1999, he won the Laus Prize for his piece *Psicomanualdigital*. He has works included in the collections of the MoMA and the Guggenheim Museum, New York.
http://www.evru.org

Joan Fontcuberta
Googlegrama: Ozono, 2006
Googlegrama: Prestige, 2007
Two digital photographs, 120 x 160cm
Ozono and ***Prestige*** are part of a wider series called *Googlegrams*. Technically, a *Googlegram* is the result of the collision of two apparently different worlds: the Google search engine and the mosaic tradition. Photographs culled from Internet have been recombined using an online photomosaic freeware application with the Google search engine. The final result is a photomontage made of 10,000 pictures readily available on Internet arranged like tiles in a mosaic. For each image, the search criteria applied by Fontcuberta are photography-related words, and the search variable is at the same time the plastic result of the tracking.
For *Googlegrama Prestige*, 10,000 pictures have been located using Google, applying as search criteria the names of ships responsible for the worst dumpings of oil at sea, from 1960 up until the *Prestige* disaster in 2002: Sinclair Petrolore, Assimi, Heimvard, Torrey Canyon, Mandoil, World Glory, Julius Schindler, Othelo, Ennerdale, Wafra, Texano Denmark, Trader, Taxanita-Oswego Guardian, See Star, Napier, Polycommander, Olimpyc Braveary, Urquiola, Hawaiian Patriot, Amoco Cádiz, Tadotsu, Andros Paria, Ixtoc I, Atlantic Empress, Patianna, Burmah Agate, Independenza, Irenes Odyssey, Exxon Valdez, Prestige…
As for *Googlegrama Ozono*, the image of the ozone depletion over the Antarctica was also built with thousands of pictures taken from Internet. The search criteria applied for locating the pictures was the names of harmful substances damaging the ozone layer. These substances are fundamentally used in cooling systems, air-conditioning equipments, aerosols, synthetic foams, fire extinguishers, spraying products and solvents used for cleaning precision instruments. The list of substances comprises: Halon [halón-1301, halon-1211], Chlorofluorocarbon [CFC 11, 12, 113,114, 115], Hydrochlorofluorocarbon [HCFC 22, 123, 124, 141b, 142b, 225], Methyl bromide, Tricloroetano, Carbon tetrachloride…
Joan Fontcuberta (Barcelona, 1955) lives and works in Barcelona. He is photographer, theoretician, critic, teacher, exhibition curator and guest lecturer at international universities and at the UPF (Barcelona) since 1993. For decades, every work made by Fontcuberta has advocated the need for profound self-reflection through the image. He has authored several books, including *El beso de Judas, Fotografía. Crisis de historia* or *Estética Fotográfica*. His work has been exhibited at Galerie VU, Quebec, (2007); Aperture Foundation, New York (2006); the Cervantes Institute (Paris, 2005); Galerie Synopsis, Lausanne (2004); ARTIUM, Vitoria (2003); Zabriskie Gallery, New York (2003 and 2004); Palazzo delle Esposizioni, Rome (2001); Museum of Fine Arts, Fukui, Japan; Redpath Museum, Montreal; Canada (1999); and Graves Art Gallery Sheffield, UK (1998).
http://www.fontcuberta.com

Dora García
Todas las historias (*All the stories*), 2001-2008
Net.art, participative online project
http://www.doragarcia.net/insertos/todaslashistorias/weblog/
Todas las historias, an online work in progress with a participative

narrative, is basically an archive of short narrations on Internet. An open process consisting of a library of micro life stories is generated from the collaboration between the readers and the artist. In no more than four lines, these micro-stories are charged with emotions, sensations and paradigms of human behaviour. The utopian drive of this project is to gather as many stories, all the experiences and human situations possible to contain as words in the same story. In consonance with new online narrative modes this project exemplifies the dynamics of recombination, recontextualisation and interrelation as the continuous and all-embracing groundbase of dialogue of Internet. Each story functions as a node registered in the Web: the world wide web of all stories. An evolving and open system which, although limitless by definition, demonstrates its relational dynamic in every one of its elements.

Dora García (Valladolid, 1965) lives and works in Brussels. Fine Arts graduate from the University of Salamanca and the Rijksakademie, Amsterdam. García focuses her work mainly on the creation of contexts and situations in which the traditional emitter-message-receiver communicational pattern is altered. In her works, García questions the beholder while exploring issues like social conditioning, chance, determinism and all types of paradoxes. She has exhibited her work, among other venues, in SMAK, Ghent (2006); Galerie Michel Rein, Paris; Fundación Telefónica, Madrid (2005); Frac Lorraine, France (2004); Museo Patio Herreriano, Valladolid; MACBA, Barcelona (2003); Galerie Jan Mot, Brussels (2002); Ellen de Bruyne Projects, Amsterdam (2001); and ARCO Project Rooms, Madrid (2000).

Marta de Gonzalo y Publio Pérez Prieto
La intención *(The intention)*, 2008
Instalation and workshop
Four audiovisual works (20' each)

La intención .In the exhibition space the visitor comes across four units reminiscent of school classrooms, each equipped with a monitor plus a series of drawings and various objects. As an installation and project, *La intención* is rooted in an extensive reflection on education, conceived as an individual and collective task that lasts a lifetime and mirrors a chosen evolutionary path. Childhood, adolescence, adulthood and old age videos are displayed on the four monitors and in the projected interventions or are shown directly on the walls. This project is presented as a multimedia performance for *audiovisual literacy*. Furthermore, *La intención* posits a critical review of a series of educational principles increasingly associated with the discourse of efficiency, competitiveness and profitability. Its proposal works in the opposite direction, imagining an audiovisual education programme which endeavours to re-articulate ideological, conceptual and functional relationships between education, creativity and life.

Marta de Gonzalo & Publio Pérez Prieto (Madrid, 1971 and Mérida, 1973). Live and work in Madrid. These two artists work collectively since 1996. Graduates in Fine Arts from the Universidad Complutense of Madrid and the University of Salamanca, respectively, they use a variety of

vehicles including installation, video or seminars to give their works a strong human teleological underpinning. They bring to this theme, the ultimate aim of their research, the possibility of active thought based on the potentiality for other images and other worlds. They have exhibited their work at Matadero Madrid (2008); Fundación "la Caixa", Lérida, Spain, (2006); MediaLabMadrid (2005); MNCARS, Madrid (2003); MEIAC, Badajoz, Spain; GAMVideoFestival; Galleria Civica d'arte Moderna e Contemporanea, Turin, Italy; Galerie Art & Essai, Rennes, France; and Casa de América, Madrid (2002).
http://www.martaypublio.net

Hackitectura
Geografías emergentes *(Emergent geographies)*, 2006
Video installation
Geografías emergentes is a project of singular territorial experiments grounded in a peripheral situation within the European and global context yet pivotal in the contemporary redefinition of relationships between technology, creativity and society.
Geografías emergentes, taking place in Mérida, Latvia and the Spanish region of Extremadura), explores the potential of a cultural exchange within a local and at once global free context, bridging peripheral territories from different countries and cultures. The documentary focuses on the actions and coexistence processes developed in Extremadura, a forerunner region in the migration to free software through OS Linux. Outside the dismantled Valdecaballeros nuclear power station, the collective Hackitectura set in place a temporary laboratory of artistic and technological experiments inviting artists, free software developers and local inhabitants of the region to participate.
WikiPlaza/Plaza de las Libertades, Seville, 2006
Architectural project
In collaboration with: Morales de Giles Arquitectos and Esther Pizarro
WikiPlaza/Plaza de las Libertades (Seville) explores the translation of practices and tools used by digital communities into the construction of a public hybrid space, a cyborg citizen territory. This project won the International Competition of Ideas for the distribution and construction of a space for freedom organised by the City Council of Seville. A public space of 30,000 m2, containing a social-cultural building with an area of 3,000 m2, located opposite the Santa Justa High-Speed Railway Station, one the city's main accesses and intermodal modes.
This urban proposal functions as a continuous, free-flowing and no-hierarchical topological space. The contribution of Hackitectura.net consists of a multi-layered architecture of networks, hardware, software and digital data enabling the social, participative production of public space as imagined by Lefebvre or the Situationists. This space would be a citizen laboratory conceived to explore the social uses of technologies and, particularly, issues such as architecture as an operating system, public space as active node of the Web, construction of social and urban interfaces, electromagnetic public space.
Hackitectura (Seville, 1999) is a collective comprising architects, artists, computer specialists and activists, devoted to the research and

visualisation of territories emerging in the interstices between physical spaces and the social and communicational dynamics of the Net. Founded by Pablo de Soto, Sergio Moreno and José Pérez de Lama, *aka* Osfa, Hackitectura collaborates on a regular basis with other groups and projects related with the exploration and articulation of emerging cartographies of political, social, economic and cultural relations in certain geographic areas, with the goal of intervening in them through the construction of new architectures of communication.
http://mcs.hackitectura.net
http://fadaiat.net

Ricardo Iglesias
José, un robot autista *(José an autistic robot)*, 2007
Robotic performance
José, un robot autista. Cybernetics is the working and experimental field dealing with the relationship between humans and machines, in order to seek the most efficient way of functional communication between both. Obviously, the already existing relationship between men and machines was underpinned by the usage and management of the action of machines, in other words, simply by its operational use. However, in *José, un robot autista* these traditional communication links between users and the technological device acquire a disturbing nuance when turning a docile vacuum-cleaner into a machine with serious communication problems with its environment.
Indeed, *José* does not respond to external stimuli, but usually isolates itself and reproduces movements and sounds demonstrating different levels of excitement and rejection of the human presence. The idea is not that of reproducing an "autistic child", but trying to express how machines can also adopt virtually pathological behaviours of non-communication which modify their interaction patterns with their environment.
Ricardo Iglesias (Madrid, 1965) lives and works in Barcelona. After graduating in Humanities at the Universidad Autónoma of Madrid, Iglesias furthered his studies in the field of creation with digital means. Co-founder of the interdisciplinary collaborative *Proyecto ß*, he currently imparts courses on interactive systems and interfaces in various universities and educational centres. In his installations and robots, Iglesias explores the complex world of relationships taking place between the subject, controlling powers and the boundaries separating the natural from the artificial. He has taken part in many Spanish and international art events, including Observatori. Valencia (2006); Hannover World Expo; SFMOMA, San Francisco; MEIAC, Cáceres, Spain; ARCO 2000, Madrid (2000); ZKM, Karlsruhe, Germany; Sónar 99, Barcelona; and MECAD, Barcelona (1999).
www.mediainterventions.net

Influenza (Rafael Marchetti y Raquel Rennó)
Madrid Mousaic *(Madrid Mosaic)*, 2005
Interactive Installation
Madrid Mousaic, is an interactive installation that explores the

relationship between urban space and communication networks, between communication "noise" and the informational and cognitive saturation of our hyper-communicated urban spaces. Through 500 pictures taken in different streets and places in Madrid, this work presents the visitor a constantly changing urban labyrinth. By combining different points of view, infinite narrative possibilities are generated. Every cluster of images forms a mosaic which is re-arranged and changed in real time when new picture fragments are incorporated. This modification of the whole mosaic results from the data flow output by the audio recorded from the streets of Madrid, and by the noises generated within the exhibition space itself. By means of this pre-recorded connection (between the distant and close, between the before and now), a fragmentary discourse of interconnected changing and dynamic data gradually evolves.

Influenza. A creation and research collective comprising Raquel Rennó and Rafael Marchetti. A Fine Arts graduate **Rafael Marchetti** (Argentina) has been working since 1990 in programming and since 2000 in the creation of digital media. In turn, **Raquel Rennó** (Brazil) is a university lecturer who is currently preparing a doctorate on residual communication modes in the urban spaces of megalopolises. Both have been artists-in-residence at MedialabMadrid. They live and work between Barcelona and Sao Paulo. Their projects have won distinctions in FILE (2004) and Prog:me (2005). Their work has been exhibited, among others, at ACM Multimedia (Singapore), FILE (Sao Paulo and Rio de Janeiro), Tohu Bohu Gallery (Marseilles), Comafosca, Nuevas Geografías (Mexico), Accea (Armenia), Soundtoys, Runme, Break 2.3 (Ljubljana), Viper (Basel), VII Digital Art Salon in Havana, and Ars Electronica Linz.

http://www.influenza.etc.br

Concha Jerez y José Iges

Terre di nessuno. Arenas Movedizas *(No-man's land. Quicksand)*, 2002/2008

Interactive Installation

http://www.terredinessuno.com

Terre di nessuno. Arenas Movedizas uses a ludo board, a game based on strong territorial leanings, as a device for mapping the no man's land of Internet. In this unprecedented version titled *Arenas Movedizas* [*Quicksand]* from the series of projects *Terre di nessuno*, visitors can play with an electronic dice on a ludo board projected on the wall. When the tokens of this virtual game board are moved and placed on some specific squares, certain windows linked to Internet sites will pop up, inviting the player to take a random journey through the map of the (un)consciousness of post-capitalism society.

Thanks to this random, interactive and visual trip through the geography of the World Wide Web, we will be given an X-ray of our surrounding network of contents. While visitors comply with the rules of ludo to open gateways towards fragmented reflections of the discourse of web portals, video projections on the side walls show juxtaposed and interweaved excerpts of news. A display of random plays of globalization.

Concha Jerez & José Iges (Las Palmas de Gran Canaria, 1941/ Madrid,

1951) live and work in Madrid. Intermedia artists and pioneers of electronic art in Spain. They have been collaborating together since 1989, when they first began to render their ideas in works of radio art, performances, installations and intermedia concerts. They have taken part in many international exhibitions and festivals, like the Ars Electronica Festival (Linz) in 1997 and 2004. **Concha Jerez** is a political scientist. She studied piano at the Royal Conservatory of Music of Madrid. From her early work developing installations in large spaces, she evolved towards performance, intermedia concerts and radio artworks. **José Iges** is an Industrial Engineer with a PhD in Information Science. In 1989 he began to collaborate with Concha Jerez on radio art and in performances, installations and intermedia concerts. Since 1985 he works as a programmer for Radio Nacional de España and directs the Ars Sonora programme in Radio Clásica (RNE).
www.joseiges.com
http://modisti.com/webs/jerez/

Kònic Thtr
Mur.muros / Distopía #II, 2007/08
Interactive installation
In ***Mur.muros / Distopía #II***, the macro and micro, the local and global, emerge as environments from the same network of dynamic and interconnected processes. This work invites the visitor to experience the complex relationships established between identity, mobility and displacement. A cylindrical space allows the visitor to access a multidimensional experience. A dynamic and interactive image reminiscent of Gaia is projected on the floor of this sensitive architecture. This image of augmented reality evolves, adopting new forms and registers through the terra_i_vida software, which allows an interaction with the sound environment of the exhibition room and its visitors. A series of sensors capturing the surrounding sounds are installed in each of the cardinal points outside the module. By fragmentizing and rebuilding them, these sounds generate the input which activates the software digital data and its continuous process of reconstruction.
At the same time, the small screens on the walls reflect different point of view related to the idea of Europe. The multisensorial network established in Mur/muros is consequently an exploration of a wide variety of perceptions of Europe through its people.
Kònic Thtr (Barcelona, 1990). Live and work in Barcelona. **Rosa Sánchez** and **Alain Baumann** comprise this Barcelona-based multimedia art platform. Rosa Sánchez is, apart from a performer and a choreographer, the art director of Kònic Thtr. Alain Baumann is a musician and a researcher in new sound generating systems. He is also in charge of developing the interactive systems used in Kònic Thtr projects. Both work at the intersection of art, science and new technologies, focusing their operations on the research and use of interactive technology applied to performative projects involving dance, performance and multimedia, as well as to the field of video-art, interactive installations and Augmented Reality. They have presented their work, among other events and venues,

at the BODIG Festival, Istanbul (2008); CECN- Centre des Écritures Contemporaines et Numériques, Mons, Belgium (2008); File Festival. São Paulo; (2006) or Mercat de les Flors, Festival d'Òpera de Butxaca i Noves Creacions and Festival neo, Noves Escenes Obertes. Barcelona (2006).
www.koniclab.info

Laboratorio de Luz
Modulador de Luz 3.0 *(Light Modulator 3.0)*,, 2008
Interactive installation
Modulador de Luz 3.0 is based on kinetic relations of projected light, and explores the possibilities of the different relationships and behaviours between light and sound depending on the sound actions executed by users. The relationship light-space-time/reflection-shadow-movement originally formulated by Moholy-Nagy's *Modulator*, is now expanded with the addition of sound in pursuit of new space-time relationships including the challenge to build a network of relationships in an empty space.
Hidden among microphones which act as sensors and three automated spotlights there is a software specifically designed to create a bright interactive semi-autonomous environment. This network of relationships feeds off ambient sounds in real time. Like fixed platforms within changeable flows, the points, nodes and agents regulate the structure of their relationships.
Laboratorio de Luz. UPV. Since 1990, Laboratorio de Luz, located at the School of Fine Arts of Valencia, works as a space for encounter, study and research into aesthetic and expressive principles related to image-light. At present, members of the laboratory come from a variety of backgrounds and their number changes depending on the projects being developed at any given time: working between the collective and the individual, between university research and art practice, between project production and the publication of texts, as a space open to all those who want to develop their work under the umbrella of this cross-disciplinary structure.
In the specific case of the *Modulador de Luz 3.0 project*, Laboratorio de Luz comprised Amparo Carbonell, Salomé Cuesta, Maribel Doménech, Dolores Furió, Carlos García Miragall, Trinidad Gracia, Moisés Mañas, Emilio Martínez, María José Martínez de Pisón, Emanuele Mazza, Dolores Piqueras, Francisco Sanmartín, Ulrike Gollner and Jeldrik Schmuch. Since 1992, the lab publishes the magazine Arte: Proyectos e Ideas, currently an e-zine available at http://www.upv.es/laboluz/revista/
http://www.laboluz.org

Joan Leandre
nostalG2 \\ L'AGE D'OR NFO.EXE, 2008
Installation, application for DOS terminal, computer, plotter
nostalG2 \\ L'AGE D'OR NFO.EXE .An application for DOS terminal is projected on the wall of the exhibition room. The program is a receptacle of historical and future excerpts of .NFO files. Most of these files contain information about commercial programs and usually about its manipulation outside the law, and instructions for unlocking through a

crack or keygen. Serial numbers of computer programs, operating failures in the terminal, historical chronology, delirium and continuous update, encrypted codes, logarithms and random programming operations. This flow of codes is executed independently by a system of cycles where visitor interaction is not possible.

Computing archaeology and history shape this tribute to seminal protocols and rituals of digital contamination and to its legal restrictions in a past largely unknown. The archaeological sense of this variety of protocols and altering syntaxes enables an encounter with the dysfunction of worldwide connectivity. A flow of global data unstoppable by any node; an ambivalent network, simultaneously creative and destructive.

Joan Leandre (Barcelona, 1968) lives and works in Barcelona. A member of the OVNI group since 1993. From 1994 to 1996 Leandre worked on the series MAP (Mega Assemble Project). Then in 1996 he created the *Oigo Project Room*. Later, after embracing the archive as a subject matter for his work, he started *Retroyou* (RC) and *Retroyou (NostalG),* two projects he is still working on. His projects have been presented at Ars Electronica, Linz; Círculo de Bellas Artes, Madrid; MEIAC, Badajoz, Spain (2006); ARCO; MediaLabMadrid-Centro Cultural Conde Duque (2005); Sonar, Transmediale, Berlin, and La Chafferie, Strasbourg (2002), among many other venues and events.

http://www.retroyou.org

Neokinok TV

TVlata *(TvTin)*, 2007

Installation, 2 monitors, DVD loop (10"),

http://www.tvlata.org

TVlata is a self-organised, independent TV project developed in Algados, a neighbourhood on the outskirts of Salvador do Bahia, in Brazil. *TVlata* is simultaneously an educational, creative, political and communication experience. Using the tools and basic knowledge to create TV broadcast footage, a group of adolescents produce texts, images, music and autonomous audiovisual narrations exercising their right to their own voice.

The collective Neokinok TV has been continuously working on the creation of didactic tools and methods for the generation of communication networks and links aimed at fostering the self-management and self-determination of citizens living on the most disadvantaged side of the growing digital divide. *TVlata* as strategy of (social, technological, activist and artistic) communication acts as an emerging mechanism of self-expression and generation of horizontal communication networks on the fringes of broadcasting companies in the mass media industry.

TVlata team: Jacob, Jairo, Luciano, Edvaldo, Ricardo, Eduardo, Anderson, Elvis, Everton, Mauro, Josinan, Tiago, Walber, Jefferson, Juliana, Leonaldo, Bruno and Josue.

Neokinok TV team: Daniel Mirakle, Félix Pérez Hita, Mónica Hernández, Susana Zaragoza and Iñigo García, in collaboration with the non-profit organization Bagunçaço.

Neokinok TV. An experimental television project started in 1998 and

coordinated by Daniel Miracle. An Arts Graduate from the University of Cuenca, Miracle was born in Barcelona in 1970, where he lives and develops his work exploring the fields of video, television, his performing arts and sound art. Neokinok has created temporary television channels using both UHF broadcasting technologies and free software through the Net, promoting active social participation. His work has been shown at a variety of venues and events, including Citemor.tv, Montemor O Velho, Portugal (2005); MediaLabMadrid (2003); Espai D'art Contemporani, Castellón, Spain (2002); XXVI Bienal de Arte, Pontevedra, Spain (2000); and the Museo de Electrografía, Cuenca, Spain (1999).
www.neokinok.tv

Marina Núñez
Sin título (ciencia ficción), 2001
Installation of fluorescent painting on wood and cables, four aluminium boxes
By Courtesy: Galería Salvador Díaz, Madrid and Collection of Contemporary Art of Castilla y León, Junta de Castilla y León
Sin título (ciencia ficción), *2002*
Installation of nine fluorescent paintings on perspex, variable dimensions, black light.
By Courtesy: Galería Salvador Díaz and the Region of Murcia
Sin título (ciencia ficción) consist in two installations in the same space exploring the hybrid and connective nature of new bodies. On one hand, nine visualizations of prosthetic bodies floating over visitors seductively proffered by technoscience and its promise of unlimited progress. Nine cyborgs bodies combining flesh and technological artefacts in an operative symbiosis suspended over the exhibition room. Men and women far beyond any mere evolution of their capabilities through technology in order to become new beings, half human, half machines (satellites, antennas…)
On the other hand, below these bodies, four black boxes provide a detailed look of the symbiosis between artificial network and biology. Each cube contains a different connection position between human body and an external undefined network. A technobiological network pinpointing the post-human body as a state of things where the flow of information and augmented biological reality transform the individual into a simple node within a network of interconnected atoms and bits.
Marina Núñez (Palencia, 1966) lives and works in Madrid. A doctor in Fine Arts from the University of Castilla La Mancha, and a painting teacher at the School of Fine Arts in Pontevedra, Spain. Her works maps the geography of posthuman beings, a cyborg hybridisation of the subject. That intersection of the body and digital technology is a recurrent feature in her videos, paintings, infographs and installations. Nuñez has exhibited her work at the Cervantes Institute, Paris (2006); Neue Spanische Kunst, Hamburger Bahnhof, Berlin (2002); Cairo Biennial (2001); Fundación Pilar y Joan Miró, Palma de Mallorca (2000); and Museo Nacional Centro de Arte Reina Sofía, Madrid (1997).
http://www.marinanunez.net

Pedro Ortuño

Blanca sobre negra *(White on black)*, 2004
Video-installation, 12 min., Spanish, colour, audio

Blanca sobre negra tells us little stories of the inhabitants of a quiet little town called Blanca. Using the registers of the documentary, the camera explores the micro-stories of three weavers talking about their jobs and routines, stories of precarious work, of social injustice and of lack of future prospects for their children. A network of lives, shaping, together with other similar lives, a social and production system built at the expense of its participants. Each subject (female worker) relies on a completely external pattern of social behaviour in order to keep the system operative, although economically and humanly unsustainable.

This work is part of a series of videos by Pedro Ortuño presenting country areas that are becoming impoverished and marginalized by techno-economical and globalizing networks of wealth and power. On the other hand, the social, cultural and labour environment of this small town in Murcia is engaged in a micro-political dynamics of exploitation, deregulation and deprivation.

Pedro Ortuño (Valencia, 1966) lives and works in Murcia. A graduate in Fine Arts from the universities of Valencia and Barcelona and a lecturer at the School of Fine Arts in Murcia, since 1989 Ortuño has regularly exhibited his videos and installations. His work explores three conceptual axes: gender and social identity, the media as a reflection of the social and public art as a means for social protest. He bases his work on the existing links between sculptural elements and the implications of image, sound, the time vector and the impression of movement. Ortuño's works have been seen at Museo Nacional Centro de Arte Reina Sofía, Madrid; Museo Patio Herreriano, Valladolid (2006); PhotoEspaña 04, Madrid; Fundación Metrònom, Barcelona (2002); Museo de Arte Moderno, Buenos Aires (2000); and Centro Cultural de España, Lima (1999), among other places.

http://www.pedrortu.com

Raquel Paricio y y J.Manuel Moreno Aróstegui

POEtic-Cubes, 2007/08
Interactive Installation

(…) This organism exists as a result of cellular cooperation where individual elements cannot discharge the duties of the group, where each unit is essential for the function and in the global form (…)

POEtic-Cubes is a robotic installation conceived to facilitate this evolution. POE is an acronym for Phylogenesis, Ontogenesis and Epigenesis (namely, Evolution, Development and Learning), the basic principles of any living being. Artificial life has taken these principles as a reference in order to resolve conflicts or satisfy daily needs, learning from the laws of nature in order to keep evolving. Through a bio-inspired process we learn from biological laws applicable to our prosthetic environment; which enables the artificial environment created as an extension of our bodies to adapt to us.

This complex bio-inspired system proposes the idea of adaptable

environments as perception systems through individual systems demonstrating the adaptation, emergency and self-organization development.

POEtic-Cubes has been created in collaboration with the Department of Culture and Mass Media of the Catalan Regional Government-EADC.

Raquel Paricio (Barcelona, 1968) lives and works in Barcelona. A Fine Arts graduate, Paricio is currently devoted to art research and production. Her interests, related with the PhD she is currently preparing at the Universidad Politécnica de Cataluña, include the study of space, devices and interfaces helping to enlarge perception through work with applications of evolutive hardware in artificial life. Paricio currently manages the on-line project: www.res-qualia.net. On this subject, she has exhibited or published at: Transmediale, Planetary Collegium, Consciousness Reframed, Technoetic Arts, Leonardo on-line, IST, Mendel Art Gallery, Fundació Tapies, Museum of Contemporary Art, Chicago, Institute for Scientific Interchange foundation, ACM, Fundació La Caixa, KRTU, Complex System Network of Excellence, Computers & Graphics (Elsevier) etc. She was co-chair at the *Aesthetical Computing* conference, June 2007. Banff, Canada, and VIDA 9.0.

http://www.evolvable.net

J. Manuel Moreno Aróstegui lives and works in Barcelona. PhD in Telecommunications Engineering, Aróstegui is currently a teacher at the Department of Electronic Engineering at the Polytechnic University of Catalonia. He has coordinated POETIC, a European research project that has led to a new family of electronic devices allowing the construction of bio-inspired electronic tissues. He has also been involved in European projects related to programmable electronic devices (RECONF 2 and FIPSOC), and with artificial neuronal networks (ELENA project). His research interests include bio-inspired computing techniques, architectures of programmable devices, models for artificial neuronal networks and design of analogical-digital microelectronics. He has more than 100 publications on this topic.

Platoniq

Banco Común de Conocimientos (BCC) (*The bank of common knowledge*), 2006/08

Performance and interactive installation

BCC (The bank of common knowledge) is a pilot experience in the exchange of knowledge. This initiative is directed at the exploitation and collective indexation of meaningful knowledge boosted with the expansion of new technologies and digital networks. *BCC* proposes a combination of activities organised from encounters and meetings taking place in public spaces where exchange experiences can be materialized (through workshops, games, expert advisory, promotion of audiovisual productions and live demos). Information, tools and knowledge are shared in an exchange network over and above commercial logic, namely, strictly based on the transfer of knowledge. A laboratory for experimenting with new modes of production, learning and citizen participation. Sharing, transferring and organising information is the most clear and practical

example of how the networked organisational pattern is in the nature itself of the social.
http://www.bancocomun.org

Platoniq. A Barcelona-based collective comprising Susana Noguero, Oliver Schulbaum, Ignacio García and Joan Villa Puig, Platoniq could be defined as a co-operative cultural system or a platform for the production and distribution of digital contents. Inspired by the Net and forms of inhabiting it, Platoniq strives to bring Internet down to street level and produce, inform and share connected culture, information and knowledge and other ways of acing. They have collaborated with institutions and organisations like the Duolum Museum of Modern Art, Shanghai; Bootlab, Berlin (2007); MediaLabMadrid (2006); CCCB, Barcelona (2005 & 2008); MACBA (2003); and the Goethe Institute (2002).
http://www.platoniq.net

Francisco Ruiz de Infante

***Reina** (Queen)*, 2007
Installation

Reina. A room almost completely closed is presented to the visitor's gaze, yet it cannot be entered because it only has a small 20cm opening. Located inside this inaccessible space is the Control Cabinet. Next to a complex network of electrical wires, the room has a socket-table powering external artefacts for their proper operation. This system is simultaneously observed by a surveillance camera and its corresponding monitor controlling the switch is always on. As the social logic (and its control systems) has migrated from mechanistic parameters to digital forms, more vivid, large and subtle new forms of control have emerged. And they are invisible. The power of surveillance techniques is grounded in the fact that they are located everywhere in the network society. The *control cabinet* is in fact the network itself.

Francisco Ruiz de Infante (Vitoria, 1966) lives and works between Paris, Strasburg and Auberive. A graduate in Painting and Audiovisuals from the University of the Basque Country, Ruiz de Infante is an artist and teacher at ESAD in Strasburg. His work focuses on the field of audiovisuals and installation. Recurrent in his visual universe are claustrophobic and dark spaces submerging the beholder in something akin to a nightmare and driving him/her on a journey through the most hidden places of memory and the subconscious. His work has been seen at CEAAC, Strasburg, France; Metrónom, Barcelona (2005); the Cervantes Institute in Casablanca, Morocco; Grand Theatre in Reims, France (2004); La Gallera de Valencia. Musée d'Art et d'Histoire de Langres, France. (2003); and at Galería Elba Benítez at Art Basel (2002).
http://www.mediatecaonline.net/ruizdeinfante

Águeda Simó

Reflecting JCC Brain Research II, 2007
VR Interactive Installation

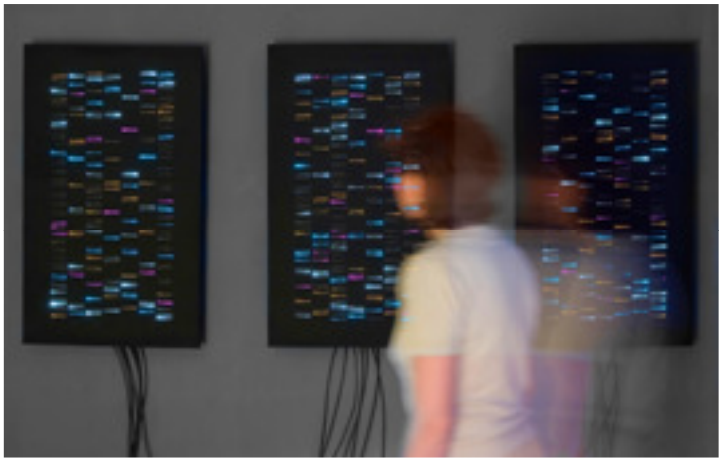
In ***Reflecting JCC Brain Research II*** the user can examine the mysteries

of the human mind navigating through the brain of a patient who has undergone brain surgery and whose nervous tissues between the prefrontal lobes and the thalamus have been sectioned. Equipped with a map (the JCC brain) the user makes connections between his/her perceptions, thoughts, remembrances, and the outside world. The user reshuffles his/her mind and awareness, feelings… Simultaneously, he/she studies how the brain works at different levels, some of them more scientific, others more fantastic. 21st century neuro-science reality and fiction are mixed in this installation with the user transformed into Descartes' animal spirits flowing through the inside and outside world of a human being whose nervous system has been partially disconnected.

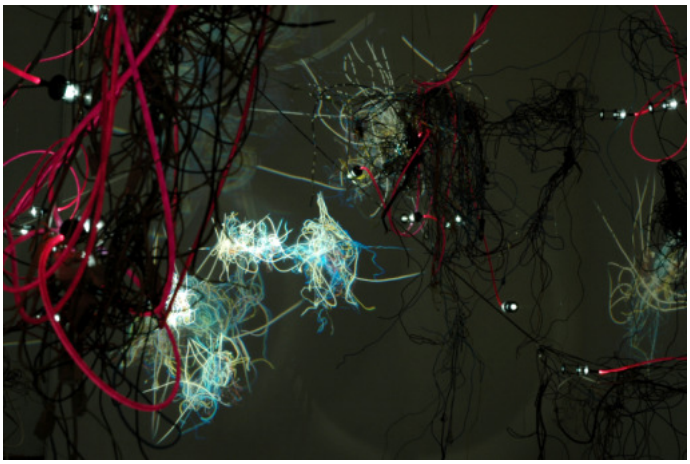
Águeda Simó (Bilbao) a multimedia artist who investigates the interaction between art and science using new technologies, Simó started her projects in the field of video developing an aesthetic that led her to work with computer graphics, and afterwards on interactive installations and virtual reality. Her work has been exhibited at Siggraph, Imagina, ArtFutura, ICMC, etc., and is exhibited in the permanent collection of the Museum of Science of San Sebastian, Spain. She has received numerous awards including a Postdoctoral Research Grant from the Basque Government, an award by the Annenberg Center for Communication, USC, a Fulbright fellowship, etc.

She taught the first Virtual Reality courses at the University of Southern California, and at the California Institute of the Arts (CalArts). She is currently director of the Program in Multimedia Design at the University of Beira Interior, Portugal. She holds a PhD in Fine Arts from the University of the Basque Country, an MA in Image Synthesis and Computer Animation from Middlesex University, a BA in Fine Arts, and a BA in Communication Science, both from the University of the Basque Country.

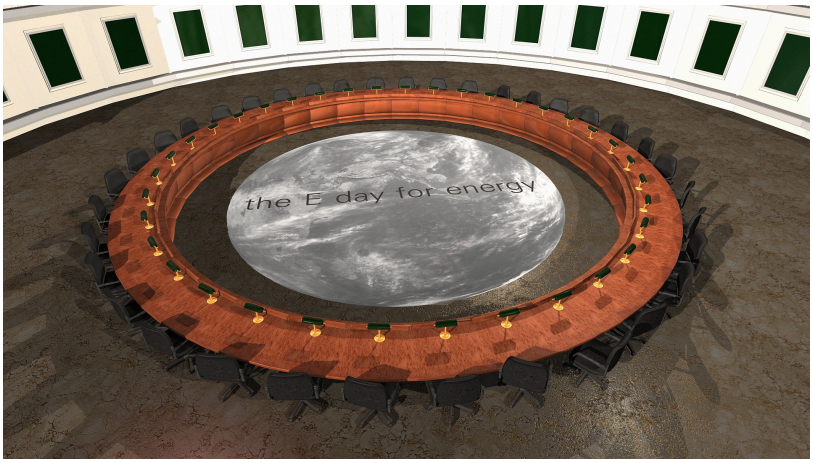
http://www.aguedasimo.net



Pablo Armesto. ***Secuencias 24*** (2005/08)
Installation

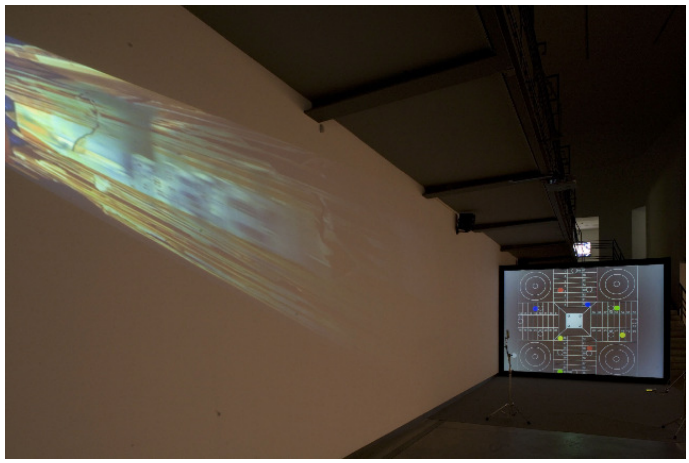


Daniel Canogar. ***Tangle*** (2008)
Installation



Alfredo Colunga. ***E-day for energy*** (2008)
Net.art

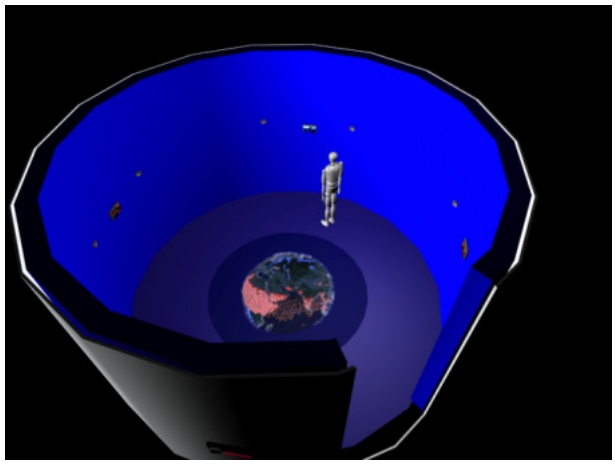
Joan Fontcuberta. ***Googlegrama Prestige*** (2007)
Digital Picture



Concha Jerez y José Iges. ***Terre di nessuno: Arenas Movedizas*** (2002/08)
Interactive Installation

Núñez, Marina. ***Sin título (ciencia ficción)*** (2001/02)
Installation

Influenza. ***Madrid Mousaic*** (2005)
Interactive Installation



Kònic Thtr. ***Mur.muros/distopía# II*** (2007/08)
Interactive Installation

Raquel Paricio y J. Manuel Moreno Aróstegui. ***POEtic Cubes*** (2007/2008)
Robotic Action

AN INTERCONNECTED NETWORK SYSTEM

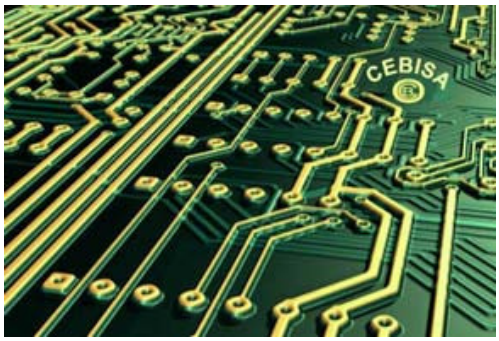
By **Jovino Martínez Sierra**, Architect

The concept of network induces us to read space as a system generating a flow of energy that is transformed and interpreted in possible pathways connecting the various works and generating an interconnected network supporting them through systems or circuits linking nodes and nets.

Each work acts like a node, an element, a differentiated gaze connected to others within that network, and activating the relations among the various pieces, generating a polyhedral and interactive landscape. These approaches will take shape through spatial systems, adapted to the nature of the works in each gallery. At LABoral - Centro de Arte y Creación Industrial, the spaces housing this installation are located in one of the former workshops projected by Luis Moya, whose spatial structure is divided into two stages or galleries on different levels.

The two galleries intervene with different ambiences and scales, linked by the shared concept of the net and the circuits that will be reflected in a contextualised way with the theme of each gallery, thus connecting the two spatial levels containing the exhibition.

Gallery 1A – Urban, Social and Information Networks

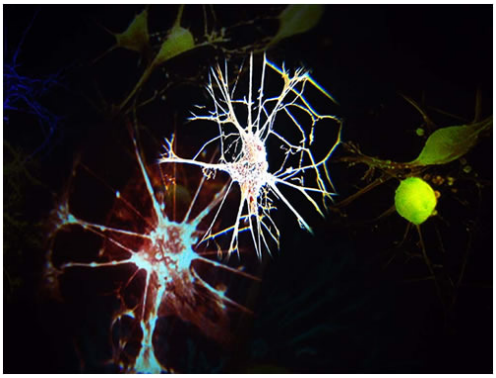


The upper level is the entrance to the space. It is the starting point for the exhibition, and a point of contact with the urban networks, whose interconnecting circuits, in lively bright colours, convey the idea that we are part of that network. From there, we enter into a gallery containing a number of works, addressing various perspectives yet mutually connected by circuits indicated on the floor and at the same time revealed by a system of vertical filters relating them with the space of the workshop. From the upper space we can visualise the lower area which presents another and adjunct perspective of nodos y redes.

Much of the current configuration of the building is used for the show, introducing a geometric system of bands connecting the existing architecture of the space with the exhibition design. These bands mirror the curved trusses of the ceiling vaults. The result is the coexistence of

various systems engaged in mutual dialogue with overlayered readings.

Gallery 1B – Biological and Interactive Networks

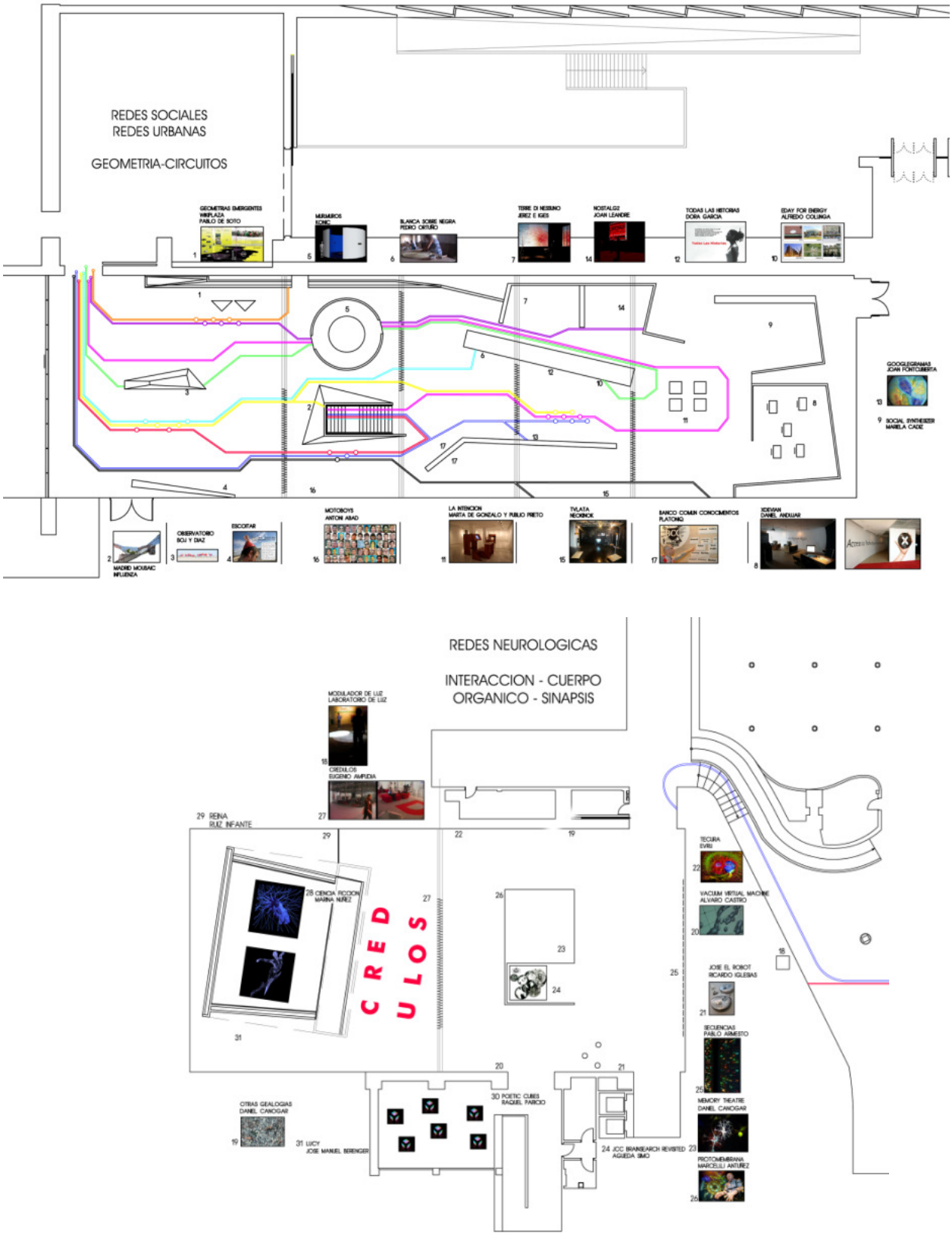


At the bottom level of the building we see a number of works related with biological networks.

The space becomes more private, reflecting the nature of the works on display. The scale makes us feel smaller, as if entering into the brain *imaginaire* through neuronal networks. The lighting is subtler, incorporating the light from the projections or exhibited installations.

The intention is to create, with the assistance of the exhibited works, a visit allowing us to move further into the more human and organic nature of biological networks, often using the interactivity of the beholder with the works.

The overall exhibition has been conceived as a journey through circuits; one outer journey through communicational links with external and social networks and with technology, and another one displaying an intimate and introspective atmosphere inducing us to reflect and to confront the nodes and networks we carry inside ourselves. And all that, intertwined with the evocative spaces of the former workshops of the *Universidad Laboral* designed by Luis Moya.



Itinerary of the exhibition in 1A, 1B and 1C Galleries according to the design of Jovino Martínez Sierra

CAJAL AND NEURAL CIRCUITS

Javier De Felipe. Instituto Cajal (CSIC)

A hypothesis on the organisation of the nervous system

In the times of Cajal, the prevalent hypothesis on the organisation of the nervous system was the reticular theory, which argued that the elements of the nervous system formed a web-like *continuum* by means of their propagations (dendrites and axons). This theory, later proven wrong, was conceived originally by Joseph von Gerlach (1820-1896). The success of this theory was due partly to the thought that if the nervous system was a continuous, uninterrupted web of propagations, it would be easy to explain how the flow of nervous information passed from one part of the brain to another. That is, the flow of information from one nervous cell to another could happen thanks to the continuity between their propagations. And then, in 1873, Golgi created the method of the *reazione nera* (black reaction.) For the first time, a histological preparation allowed the observation of all the parts of a nervous cell (the soma, dendrites and axon.) So it was observed that neurons have a very complex arborisation at the axons and dendrites, to the extent that if a region of the brain was chosen and every neuron in it, with its dendrites and axons, were to be stained, the result would be such an extraordinarily dense tangle of somata, axons and dendrites that it would be impossible to analyse it. Another advantage of the Golgi method is that several cells could be stained in a single preparation—albeit only a small number of them—so that individual nervous cells could be studied as well as the possible connections between them. Yet, despite the excellent results of the Golgi staining method, Golgi himself remained the most salient supporter of the reticular theory, proposing that dendrites had open ends but that axon collaterals anastomosized and formed an extensive network, thus suggesting that the nervous system consisted of a *rete nervosa diffusa* (diffuse nervous web), supporting in part the reticular theory of Gerlach. Golgi always held on to this conviction, which he defended even in the lecture he gave when he was awarded the Nobel Prize along with con Cajal.

In the first article he published after using the Golgi method, Cajal confirmed Golgi's observation that dendrites had free ends, but also added another, crucial to the neuron doctrine, that this was also the case of axon collaterals, which would then form a "free" arborisation (without anastomosis.) He asserted that "each [nervous cell] is a fully autonomous physiological canton" (Cajal, 1888). Thus, from the beginning Cajal conceived of nervous cells as functional and anatomical units that communicated with each other by means of contact or contiguity, not by continuity. Cajal continued to furnish numerous observations that supported the neural doctrine in various parts of the nervous system in

different animal species. Between 1888 and 1892 he published over 30 articles, which were summarised in his first review of the structure of the nervous system (Cajal, 1892), clearly formulating the neuron doctrine. The results of these early studies were so decisive that they constituted the core of the classical and influential literature review article in support of the neuron doctrine published by Wilhelm von Waldeyer-Hartz (1836-1921) in 1891. In it, this scientist used the term *neuron* to refer to the nervous cell (Waldeyer, 1891). Cajal summarised his own contributions to the neuron doctrine in several articles and books, particularly in the essay *¿Neuronismo o reticularismo?* (Neuronism or reticularism? Cajal, 1933). Thanks to the introduction of the electronic microscope in the 1950s, along with the development of new methods to prepare nervous tissue for ultrastructural analysis, it was possible to examine the ultrastructure of the synapsis to confirm one of the main tenets of the neural doctrine: the presynaptic and postsynaptic elements are separated physically by a space about 10 to 20 nanometres wide, which is known as the synaptic cleft (*see* DeFelipe, 2007).

The law of dynamic polarisation

The neuron doctrine involved a radical shift in the conception of how information could flow within an "infinitely fragmented" brain, as opposed to a continuous neural reticulum. That is, it remained to be known how the nerve impulse travelled from one nerve cell to another across a physical gap. One of the significant offshoots of Cajal's neuron doctrine was the theory of the law of dynamic polarization of nerve cells, which he proposed to explain the transit of nerve impulses through neural circuits. At the time it was believed that the function of dendrites was mainly one of nourishment, and that axons transmitted nerve impulses out of the cell (a generalisation based particularly in the logical conduction pattern shown by motor neurons from the spinal cord to skeletal muscles.) In 1889, Cajal proposed that at least in some cases dendrites functioned as current receptors (Cajal 1889), and two years later (Cajal 1891) he attempted to generalise this idea with the law of dynamic polarization, which was based on the direction followed by impulses in different regions of the nervous system where the anatomical path that had to be followed by nerve impulses was evident, such as the retina and the olfactory bulb (from the outer world to the inner world of the nervous system.) Thus, he proposed that neurons could be divided in three different functional regions: a receptor apparatus (consisting of the dendrites and the axon), an emitting apparatus (the axon), and a distribution apparatus (the axonal terminal arborisations.) Later on, Cajal realised that the soma does not always intervene directly in the conduction of the impulses, and that sometimes the nervous current goes directly from the dendrites to the axon (Cajal, 1897). Consequently, the law of dynamic polarisation gave way to the theory of axipetal polarisation. These studies had a great influence on the scientists of his age, and the observations and theories of Cajal were proven in their essence.

NETWORKS, THE VITAL PRINCIPLE

By **Diego Rasskin-Gutman y Ángela D. Buscalioni**

The genetic code of this article: sequence in time: red, black, blue, green (red and blue, text by Rasskin-Gutman) (black and green, text by Ángela D. Buscalioni). The sequence in space, as it appears delimited by the formatting. The rule or imitation is the coherence of the text.

In the early 20th century, modern biology experienced a series of great discoveries; the theory of evolution had established itself in textbooks, Mendelian genetics had been rediscovered, and cellular theory provided a coherent foundation to the substrate of living beings. Many of the ideas and concepts of this time rested on the intuition of the researcher, who despite his lack of knowledge was eager to probe and discover new horizons. The nature of the phenomenon of life was the stuff of scientific, metaphysical and religious debate. Answering the question "what is life?" was a task that seemed increasingly possible as discoveries succeeded one another. Two opposing theses dominated this debate, offering two fundamentally different answers to the "issue of life." On one hand, the vitalists supported the existence of a substance or some other indeterminate source of the vital phenomenon, one completely unrelated to the subject matter of physics and chemistry, the "*élan vital*" of Henri Bergson. On the other hand were the mechanists, scientists convinced that biological complexity could be reduced to the physico-chemical study of its components. The debate dwindled gradually as the 20th century unfolded. Molecular biology has taken on the task of ridding the inside of cells of all its mysteries, and has been unravelling the biochemical components that place the phenomenon of life in the domain of natural phenomena. Mechanicism has won the battle. Yet, any biologist would admit that living organisms have a structure and functioning that cannot be reduced to or fully accounted for in molecular terms. This singular structure of the vital phenomenon is its organisation, the interconnections between the elements that make up cells.

Networks, interconnections, relationships established between the parts of a system. Events take place, possible *elective affinities* in the words of the great German poet, the result of the synchronic and diachronic repetition of these relationships.

To individuate the parts, there is more individuality within a context of

sympathetic individualities. How can an affinity be recognised if not through the establishment of relationships? Networks provide an identity to the parts of the system. We are built, life is built, organised and selected in the rhythms of the system's relationships.

How not to see life, this phenomenon that drives us to pursue knowledge and know each other, as a web of networks. Networks. Networks of networks. Meta-networks. The world is defined by facts rather than things—this time our motto comes from the Vienna of positivism—and facts are what happens, what takes place and what occurs. In the language of science, which may always seem cryptic and needlessly defiant, it is processes, and not patterns, that make the machinery of the vital phenomena run its endless course. Come to think of it, it is a true perpetuum mobile. Life as a continuum is a process whose motion started thousands of millions of years ago, and it is still revolving. All of it thanks to networks.

But networks are not organised matter, they are but a pulse, a message, differences in energy potentials, information bits, a series of functions. They are the lights and shadows that rhythmically draw the various routes in time and space that a system can follow. Yes, they are part of the vital phenomenon, but would there be infinite networks if they were not limited by patterns or matter? Networks are trapped in the material patterns of natural forms, those patterns that have been recognised as the parts of a system. Our beliefs and social networks are restricted in the ways in which individuals are organised within a society, or in the way in which we define individuality. We could incorporate to our beliefs each of the animals in nature and we would have a network of the spiritual world with a cosmogony different from monotheism.

The notion that networks have no structure could be challenged, and depends on the level of biological organisation of which we speak. A network of interaction among genes is an information transfer network, but a network of interacting cells is a properly differentiated structure, and the network of the circulatory system, or neural networks, or the connectivity networks in the skeletons of vertebrates all present a defined structure that mediate their functionality.

In the definition we are constructing of how networks are structured by the dynamics that they can generate, the object (or individuality) that generates the network is in turn influenced by it, even in the case of cellular interactions. However, an organism is an open system since its inception, so if only to consider the degree of complexity in which we operate, we should also mention the role played by the fluctuations and the noise of the environment (physical, chemical and spatial) in which these interactions take place.

Every organism, from bacteria to animals, including seaweed, fungi and plants, have clearly delimited parts composed by highly specific chemical entities known to all of us: carbohydrates, fats, proteins, DNA, RNA, and

hundreds of minerals and other special molecules that are repeated over and over, that are being built constantly within the living unit par excellence: the cell. These parts and these compounds are organisational levels of organisms. They are modules with a specific structure and function which derive from the interaction of those components. They are networks. And when an interactive network pursues a behaviour defined by properties generated by itself in a process that we define as self-organisational, this gives rise to the phenomenon of stability, of repetition, of circularity, and of behaviours that recur with alarming precision (...)

NETWORKS IN THE NANOWORLD

Carlos Briones, Susanna C. Manrubia y **Jose Ángel Martin-Gago**.
Centre of Astrobiology (CSIC-INTA), Madrid

When we observe the world around us, we perceive that inorganic as well as organic matter, inert materials as well as living beings, are characterised by an ability to self-organise forming ordered structures and networks. Atoms arrange their electrons in a rigorous manner, molecules assemble or adjust to each other in coordination to construct structures of higher complexity… Nature's fixation with organisation has aroused the curiosity of researchers, who have attempted to make out the hidden order of multiple systems and processes to better understand the fundamental mechanisms and laws that govern such organisational networks at every level.

It is obvious that in order to form organised structures, an electron, an atom or a molecule need to recognise similar units and have them behave in a specific manner by means of some sort of *force*. Today we know that four types of interactions or forces govern natural processes. The influence of the first two can only be felt at minute distances, shorter than atomic nuclei (of the order of a *femtometre*, that is, a billionth of a millimetre): the strong nuclear force is responsible for holding the units of the atomic nucleus together (protons and neutrons); on the other hand, the weak nuclear force has to do with the interactions between the particles that form protons and neutrons (known as *quarks*) and makes possible certain types of natural radioactivity.

In contrast to these, the other two fundamental forces have a *long scope of action,* since their effects can reach any distance, theoretically an infinite range. Besides, we are much more familiarised with these two forces, since they govern the processes that our senses can perceive. Gravitation, or gravity, is the mutual attraction experienced by two objects as a function of their mass, and it is responsible for large-scale movement in the universe, for instance the organisation of the planets around the Sun. It is also responsible for our having "our feet on the ground" and for apples falling off trees. Last of all, electromagnetism or the electromagnetic force governs the behaviour of matter as a function of its electric charge, and can be attractive (between particles with different-sign charges, such as the electron and the proton) or repulsive (between same-sign charges). The electromagnetic force is involved in the physical and chemical transformations undergone by atoms and molecules, and is responsible for the formation of structures—and networks—among them. Thus, at the scale typical of molecules (of the order of a nanometre, that is, a millionth of a millimetre) electromagnetic interactions are the only ones that have a perceivable effect. In other words, electromagnetism is

the basis of chemistry, the engine of the *nanoworld.* There are many manifestations of this force in our daily life (in fact, our life *is* electromagnetism): objects have colour, there are foods that we like and foods we do not, our car and mobile phone work… and when we shake somebody's hand, our hands do not blend with each other, and we do not permanently fuse with the person we are greeting.

Thus, rooted in the domain of molecules and dominated by electromagnetic interactions, *nanoscience* has emerged as the experimental framework destined to shape the relationship between mankind and matter in the 21st century. Two of its derivatives, *nanotechnology* and *bionanotechnology,* are the interdisciplinary tool used in laboratories to coordinate atoms, inorganic molecules or biomolecules in order to construct higher structures with specific functionalities, just as atoms get arranged in a lattice or the way that living beings assemble simple molecules to synthesize larger and more complex ones. Just like physics was the "star among the sciences" in the first half of the 20th century, and molecular biology the star of its second half, nanotechnology will rule over the century that has just opened. Much remains to be known about the organising capabilities of nature before it can be imitated with accuracy, but there is no doubt that we are on our way: today's nanoscience will be tomorrow's nanotechnology.

Among the *nano-objects* that have been designed already in the labs, perhaps the most promising are carbon nanotubes. These are constructed by folding planes of carbon atoms (connected to each other in a hexagonal lattice reminiscent of honeycombs) to generate three-dimensional arrangements. The 2-D lattice becomes a 3-D lattice. It is as if the net of a fisherman was folded or curled upon itself and at the same time its size shrunk to a thousand-millionth of the original. This generates a tunnel of nanometric dimensions that can be used to conduct electrical currents or store molecules, among other applications.

The technique that has contributed most to the development of nanotechnology has been electron microscopy, which includes the "atomic force microscope" and the "scanning tunnelling microscope". These new and revolutionary technologies derive from the *quantum* properties of matter, that is, of the laws and behaviours that rule the world below the nanometre (inhabited by atoms, electrons, atomic nuclei…). The quantum world is ruled by laws different from the ones we take for granted in our Cartesian world: what our reason may dismiss as absurd and nonsensical (for instance, the idea of an object not being in one specific spot, but rather delocalised and with a certain probability of being in any of a number of accessible places) is a perfect description of the organisation among and within atoms. In addition to the peculiarities of the quantum world, the new scanning probe microscopy techniques have been a technological revolution, and made possible what scientists had been dreaming about for at least the whole past century: to see not only the molecules… but the atoms! They have been called, deservedly, "the eyes of nanotechnology". But they are also its hands, for these microscopy

techniques also allow us to act on the molecules or atoms, to move, manipulate, and arrange them, or to alter the structures or the networks of electromagnetic interactions in which they are embedded. The new technologies allow us to not only see the network, but to construct it too.

LANGUAGE, GENEALOGY AND INHERITANCE.THE CONSTRUCTION OF SOCIAL NETWORKS

In one of its countless branching events, the evolutionary process had certain multicellular eukaryotes turn into animals, and then some primates develop their brains enormously. Evolution made us human. Nowadays, social beings that we are, when we think of our relational networks we tend to overemphasize the significance of a (contingent) history, family inheritance, our memory. But the behaviour of large groups is ruled by statistical principles, not by personal volition. There are forces among us that pull us toward or away from others, that make us prefer one group to another. At times, our personalities vanish and we seem to have become a group of social insects rather than a society of distinct individuals. Perhaps we are but particles sustaining interactions, photons that interweave their existence to that of others and partake in a relational network encompassing all of mankind, a network whose reach we would recognise were we not this short-sighted. When we define our being in the world by the immediacy of the here and now we narrow our perspective. Our own relational dynamics dictate who is or is not in our neighbouring nodes, and conditions the building of circuits which, from a bird's eye view, traverse all of society. Percolate through it. On certain occasions, the plan of a city is but a surface covered in atoms in which the network is defined by their absence. Just like the nanoworld constructed the chemical universe with the aid of the fundamental forces, a universe that set the principles which allowed the evolution of life and of complex brains, and the latter are the foundation that makes society and culture possible, so we must imagine higher levels of organisation that transcend us and in which we are the equivalent of those simple RNA molecules that travel within a boundless space of sequences subjected to the currents of evolution.

At the foundation of our social being, of our being trapped within a network, is our cultural and biological baggage. It is an enormous amount of inherited information that links us to each and every other human being in this dense world. We are the children of two individuals of different sexes. One gave us our surname, the other our mitochondria; both passed on their nuclear genes, intimately entwined, and their language. What we brandish as our individuality is in fact the complex articulation of what has been given us, and their expression within an environment that conditions us in a thousand imperceptible ways. We are beings in context, inextricable nodes in the network of humanity.

Our inheritance is visible in our genealogies, among other things. We have two parents, four grandparents, eight great-grandparents, and so on, in an explosion of individuals that lived in the past and who have bequeathed to us part of their genomes, as shown in the family tree (figure 3). This is our local version of the tree of life, the one that eventually links us to fungi,

plants, bacteria, and every other living being. The surname or the language that we speak, two features to which we tend to feel overly attached, are but a minute fraction of what we accumulate constructively. If we go back but two hundred years in our family tree, the number of our ancestors increases to about a thousand individuals. Probably all of them contributed to our genome. Only one contributed to our surname.

The situation becomes paradoxical if we continue to look back. A hundred thousand years ago, between ten and a hundred thousand modern humans populated the Earth. Our family tree, then, should show an inexpressible number of individuals: one followed by about fourteen hundred zeroes. But only the humans who existed at that time can be part of the family tree. There is a simple solution to the riddle. As we go back in our tree, the frequency of individuals who are repeated increases: we all know examples of more or less distant relatives who have married among themselves. This is the source of the repetitions, and also an evident example of how society builds its networks… and how the networks in turn shape society. The similarities among the family trees of any two individuals chose at random increase as we go back in time. We do not need to go far. Let us picture a population of a thousand individuals in which couplings occur randomly and whose size has remained more or less constant through time. It only takes eighteen generations for the family trees of every individual to be identical, a point in which an ancestral population appears (about 80% of the total) who are the forebears of all of the present individuals. In a population of size N of the above characteristics it takes an average time of about 1.77 log N to find the first common ancestor of two randomly chosen individuals. And the leap from the first common ancestor in two family trees to a full match happens in about fourteen generations, regardless of population size. This is too short a time to assert that our differences are due to inheritance.

Geographic isolation, much more common in preceding centuries than in our globalised present, has fostered diversity among humans. Those populations that remained isolated the longest have cultural features farther from the average than other populations that have sustained regular exchanges. Linguistic diversity is the clearest example of how the sole factor of geographical barriers that constrain mobility can lead to the emergence of multiple detached communities as far as language is concerned. On the other hand, the effect of such barriers disappears as soon as regular relations are established between two groups that differ in their languages. The more than 500 languages spoken in Papua New Guinea are an example of the first situation; the development of the Creole dialects in the span of a few generations out of a need to establish trade contacts, and the loss of grammatical complexity that it entails, is an instance of the second. Our world has experienced an irreversible transition toward homogeneity with the development of means of transport and the global information network. The population flows, the ease with which we travel long distances, the increasing probability of living in several different places far from each other, and the mingling of cultures involved in all of the above have changed the structure of the

cultural and linguistic inheritance process. In the European farming societies of the past few centuries, the typical distance between the original residences of a husband and a wife ranged between 5 and 10 kilometres. At present, this distance is much larger. Worldwide population flows, which do nothing but increase, configure a new social structure. Languages are lost irreparably, and their transmission is no longer ruled by parent-child inheritance, but by a socio-cultural engine that pushes individuals to move in search of a life that may not be better, but is certainly more Westernised. And plugged into the net.

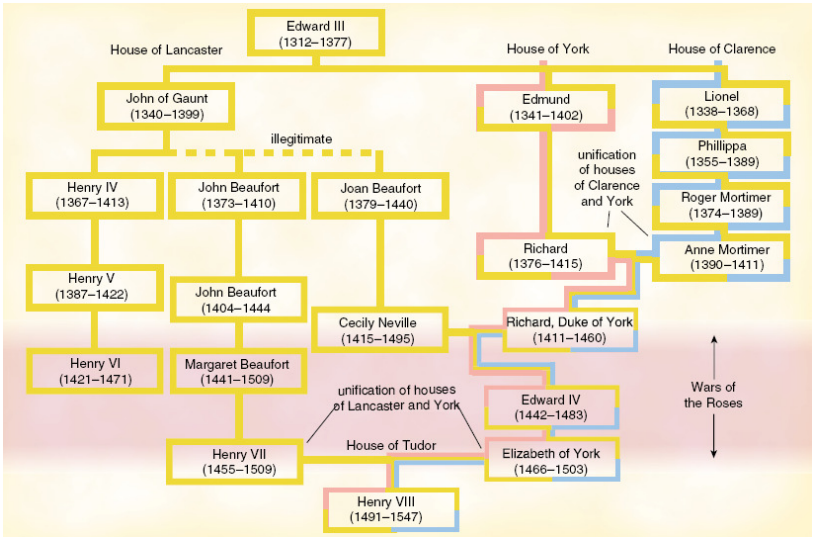


Figure: *The family tree of Henry VIII or the social network of his ancestors? Repetitions in genealogy are common not only in small populations (such as aristocracy, which consists of individuals historically bound to marry others in their own class) but in any population as long as we go far back enough in time [Figure extracted from the article "Genealogy in the Era of Genomics" by S. C. Manrubia, B. Derrida and D. Zanette published in American Scientist 91, 158-165 (2003)].*

(Excerpt from *Atrapados en la red: nanomundo, vida sociedad,* from Carlos Briones, Susanna C. Manrubia y Jose Ángel Martín-Gago

THE ROLE OF INFORMATION NETWORKS IN THE EVOLUTION OF SOCIAL COMPLEXITY

By **Pedro C. Marijuán**. SAMCA (CPS-I3A) Professorship, University of Zaragoza

1. The evolution of societies toward complexity

One of the themes most discussed in the social sciences pertains to the sources and evolution of social complexity. Here, we will explore how current studies of *networks* and certain discussions around the construct of *information* are opening new conceptual avenues toward the understanding of social complexity, including knowledge structures, which we ought to research in detail. By the way, it may be a sign of our times that there is an even greater interest in the "collapse" of societies than in their complexity per se (Tainter, 1989, was one of its pioneers).

If we take the work of Diamond (1996) as a starting point in regards to the social, it affords us a dense table that provides support for the argument of the *adaptive* nature of social complexity. This table details various features invariably shown by societies as they increase in complexity. It consists of a series of social elaborations and institutions of great variety (kinship systems, labour divisions, exchanges, codes and norms, numbers, writing, religions, knowledge systems, legal systems, administrative and political bureaucracies, et cetera,) many of which were clearly "informational."

Rather than associating them with a hypothetical "progress" of the social order, such elaborations must be understood as *adaptations* of the social structure to the possibilities offered by the environment. And one of the original factors that historically allowed mankind to go beyond their basic group size and structure—the hunting-gathering bands of about one hundred members—was the acquisition of knowledge toward the creation of artificial ecosystems: The domestication of plants and animals (agriculture and stockbreeding.) The development of very different sets of foods, singularly marked by continental axes ("the axes of history") is what defined the relative strength of each of the geographical areas devoted to the production of food and the distribution of the corresponding human populations, along with their genes, cultures, languages—and even their germs! (Diamond, 1996).

When classical anthropology approached the discussion of the evolution of the successive organisational stages (of "progress") in terms of *bands, tribes, fiefs* and *states* or empires, or when more recently it adopted a newer perspective based on adaptation, it is worth noting that each organisational stage or gradation of the social system brought an increase of at least one order of magnitude: from tens or hundreds, to thousands, tends of thousands, hundreds of thousands, millions of individuals. This is

crucial in terms of networks. We could argue that each organisational stage brings forth a linear increase of the *diameter* (the logarithm of size) and a geometric increase of the *crossing speed* (the time associated to the diameter), both essential factors for the effective interaction of individuals within their corresponding social network.

The above would offer a new approach to understanding the correlations of social complexity. The emergence of new societies of higher complexity and organisation requires the development of informational systems for communication between individuals capable of covering the new social diameters, which are comparatively much larger, at substantially higher crossing speeds. Furthermore, these new relational tools would enable the emergence of multiple networks and sub-networks overlaying the basic fabric of social relationships, of variable complexity (harder to regiment hierarchically) and of equally variable duration, no longer limited strictly to the "strong" or permanent quality of family and kinship bonds characteristic of tribal groups.

In other words, the great informational and communications inventions that mark history—the alphabet, codes, seafaring, digits, the printing press, modern science, the steam engine, motor vehicles, computers—can also be seen as abstract tools for the articulation of multiple social networks and coalitions of a new kind, which partake in the deconstruction and reconstruction process of the existing social order by means of the heterogeneous types of "weak" ties that they foster, paradoxically with higher efficiency and with a broader range of action than the former so-called "strong" ties. Historically, what we here label as *weak ties* are constituted as authentic "bonds of civility" (Ikegami, 2005). Would the industrial revolution have been possible without the collaborative networks of modern science? Or the scientific revolution without the communication afforded by books and other printed materials" Or the current process of globalisation without computers and the Internet?

The concept of the network is directly tied to the concept of information. Though some studies have already researched experimentally the role of information and of communication networks (particularly electronic ones) in the complex world of social bonds and ties, analysing the resilience, diversity and complexity of its emerging structures (Bohannon, 2006), this direction hardly seems sufficient. For many reasons, some of which we will present momentarily, the informational study of societies is in a most rudimentary stage (Howard and Schiffman, 1998; Marijuán, 2002), despite the fact that we are living in the *Information Age*.

2. What information is conveyed through communication networks?

A historical review of what was communicated in the Sumerian tablets, the Greek and Roman papyruses, or in much more modern media, would reveal an interesting coincidence. In any age, the unfathomable blend of "the human" is what permeates the social communications media.
As McLuhan posited (1964), *"the medium is the message"*. Media exist to

contribute content to each other, to feed one another, starting from the basis of oral communication (though this is not their only source). Consequently, we cannot escape the problem of the "meaning" of all this circulating information, generated verbally and transmitted by the media, as McLuhan pointed out as well. We need a new conceptualisation or theory, beyond Shannon's physico-theoretical information and the logic systems of artificial intelligence, one allowing the analysis of the "signification", the "meaning" of information as generator and vehicle of social relations, at the levels of both the individual and society.

THE NETWORK SOCIETY*

By **Manuel Castells**. University of California (Berkeley)

Our exploration of emergent social structures across domains of human activity and experience leads to an over-arching conclusion: as an historical trend, dominant functions and processes in the Information Age are increasingly organized around networks. Networks constitute the new social morphology of our societies, and the diffusion of networking logic substantially modifies the operation and outcomes in processes of production, experience, power and culture. While the networking form of social organization has existed in other times and spaces, the new information technology paradigm provides the material basis for its pervasive expansion throughout the entire social structure. Furthermore, I would argue that this networking logic induces a social determination of a higher level than that of the specific social interests expressed through the networks: the power of flows takes precedence over the flows of power. Presence or absence in the network and the dynamics of each network *vis-à-vis* others are critical sources of domination and change in our society: a society that, therefore, we may properly call the network society, characterized by the pre-eminence of social morphology over social action.

A network is a set of interconnected nodes. A node is the point at which a curve intersects itself. What a node is, concretely speaking, depends on the kind of concrete networks of which we speak. They are stock exchange markets, and their ancillary advanced service centers, in the network of global financial flows. They are national councils of ministers and European Commissioners in the political network that governs the European Union. They are coca fields and poppy fields, clandestine laboratories, secret landing strips, street gangs, and money-laundering financial institutions in the network of drug traffic that penetrates economies, societies and throughout the world. They are television systems, entertainment studios, computer graphics milieux, news teams, and mobile devices generating, transmitting and receiving signals in the global network of the new media at the roots of cultural expression and public opinion in the Information Age. The topology defined by networks determines that the distance (or intensity and frequency of interaction) between two points (or social positions) is shorter (or more frequent, or more intense) if both points are nodes in a network than if they do not belong to the same network. On the other hand, within a given network, flows have no distance, or the same distance, between nodes. Thus, distance (physical, social, economic, political, cultural) for a given point or

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***** (Excerpt from *The Rise of the Network Society (New Edition) (The Information Age: Economy, Society and Culture Volume 1)*)

position varies between zero (for any node in the same network) and infinite (for any point external to the network). The inclusion/exclusion in networks, and the architecture of relationships between networks, enacted by light-speed-operating information technologies, configure dominant processes and functions in our societies.

Networks are open structures, able to expand without limits, integrating new nodes as long as they are able to communicate within the network, namely as long as they share the same communication codes (for example, values of performance goals). A network-based social structure is a highly dynamic, open system, susceptible to innovating without threatening its balance. Networks are appropriate instruments for a capitalist economy based on innovation, globalization, and decentralized concentration; for work, workers and firms based on flexibility and adaptability; for a culture of endless deconstruction and reconstruction; for a polity geared toward the instant processing of new values and public moods; and for a social organization aiming at the supersession of space and the annihilation of time. Yet the network morphology is also a source of dramatic reorganization of power relationships. Switches connecting the networks (for example, financial flows taking control of media empires that influence political processes) are the privileged instruments of power. Thus, the switchers are the power-holders. Since networks are multiple, the inter-operating codes and switches between networks become the fundamental sources in shaping, guiding and misguiding societies. The convergence of social evolution and information technologies has created a new material basis for the performance of activities throughout the social structure. This material basis, built in networks, earmarks dominant social processes, thus shaping social structure itself (...)

THE FRAMEWORK FOR LABORAL CENTRO DE ARTE Y CREACIÓN INDUSTRIAL

In March 2000, the Lisbon Extraordinary European Council decided to boost community policies at a moment when the economic map of the European Union member countries held out the promise of competitive development. All the leaders taking part at the Summit agreed on a commitment to place Europe at the forefront of the Information Society (IS).

The globalisation of the economy and the growth of Information and Communication Technologies (ICT) provide clear evidence of the progress and trends in contemporary society, and this is particularly true in the sphere of culture, entertainment and leisure. The technological challenge consists of ensuring that economic and social transition does not leave behind any segment of the citizenry and that its fruits are shared equally. That is the main goal of the "e-Europe" initiatives organised by this Commission.

The Information Society defines a new social model that aims to enable the whole of the citizenry to generate access, use and obtain information and knowledge from any place and at any given time.

With the aim of contributing to this new society, the Government of the Principality of Asturias has devised a "Strategy for the Development of the Information Society in the Principality of Asturias" (e-Asturias 2007), a programme incorporating the European and international principles commonly accepted and ratified at the World Summit on the Information Society (Geneva, December 2003), adapting them to the specificities of Asturias.

LABoral Centro de Arte y Creación Industrial can be placed within that general design, and lays its foundations on the idea of fostering the production and consumption of new media art.

The initiative is implemented along three lines:

- Creation of an environment for development with the participation of an open network of multidisciplinary creators and users working at the LABoral Centro de Arte.
- Execution of tasks of research, production of exhibitions and events, and coordination and documentation concerning the use of new media in both theory and practice.
- Generation of web communication channels open to the public, allowing its involvement in the artist's creative process.

The target of the LABoral project are artists and creators in general, as well as all those members of the public interested in art and technology.

AUDIOVISUAL CONSUMPTION IN ASTURIAS

In 2005, the Information Society registered a positive evolution in Spain as shown by the indicators related with the proportion of Internet users (37.1%) and the level of technological equipment, which are transforming leisure and entertainment habits and the configuration of Spanish homes, according to data from the INE, Spain's official statistics board.

In Asturias, according to first wave of EGM (General Media Studies) in February March 2006, 36.2% of the population was connected in the last month.

Internet has produced new digital habits, like talking to friends in chat rooms, listening to music downloaded from the Net, sharing music, reading digital press, etc. New uses occupying a long consumption time (131.9 minutes at home and 81.9 at work).

According to sources from INE, half of Asturias population from ages 16 to 74 uses Internet. There are no differences regarding gender, but there do exist when we look at level of education and the economic circumstances of the homes, a factor that makes a big difference in access to new technological equipment and, therefore, to new ICT.

In the first half of 2006, 56.1% of families in Asturias had a PC, and 40.5%, Internet connection.

Asturias leads Spain's regions in access to Internet through cable network, and stands third in the ranking of homes connected with broadband, with the Canaries in the lead.

THE LABORAL FOUNDATION. BOARD OF TRUSTEES

The LABoral Centro de Arte y Creación Industrial Foundation is a cultural body to serve the general interest, as well as the governing body of the art centre. The aims of the Foundation as described in Article 6.1 of the statutes are "*to promote and disseminate art and industrial creation through the management of LABoral Centro de Arte y Creación Industrial*."

The following corporations, public organizations and companies are listed as founders of Fundación La Laboral Centro de Arte y Creación Industrial:
Principality of Asturias
City Council of Gijón
Acciona, S.A.
Alcoa, S.A.
Caja de Ahorros de Asturias.
Constructora San José, S.A.
Dragados, S.A.
FCC Construcción, S.A.
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WHAT IS LABORAL?

The LABoral Centre for Art and Creative Industries is a space for artistic exchange. It was born with the aim of establishing an alliance between art, design, culture, industry and economic development, and aspires to become a space for interaction and dialogue between art, new technologies and industrial creation. Between its walls, it opens the way to the production, creation and research into the most recent artistic concepts.

LABoral Centro de Arte y Creación Industrial is in the old Universidad Laboral as part of the set of projects developed by the Principality of Asturias for its City of Culture. Gijón, Asturias.

LOCATION

LABoral Centro de Arte y Creación Industrial is located in Gijon, Asturias, at around three kilometres from the city centre. Premises originally conceived for vocational training now house the over 14,400 functional square metres that are devoted to the exhibition, research, training and production of new art and creative industries.

Address: LABoral Centro de Arte y Creación Industrial
Los Prados, 121
33394 Gijón (Asturias)

Getting There

By car
A-8 motorway. Take bypass on arrival to Gijon. Salida (exit) km. 385 Viesques. Follow directions to Hospital Cabueñes. Take third exit at third roundabout.
The Centre has a public car park.

By bus from Gijón
The bus stop for the Centre is "Parada Universidad Laboral". The bus lines available are the following:
Line 1 Cerillero- Hospital de Cabueñes
Line 2 Roces- Hospital de Cabueñes
Line 4 Cerillero- Viesques- Hospital de Cabueñes
Line 18 Nuevo Gijón- Hospital de Cabueñes

By plane
Closest airport: Asturias (Castrillón). Around 40 km from the Centre.
A8 motorway, direction Gijón.

OPENING HOURS

OPEN 12 noon to 8 pm
CLOSED Tuesdays (except public holidays); 1st January and 25th December

ADMISSION

General public	€5
Reduced	€2

Students (University card, Youth card or International Student card); > 65 years old and unemployed
Free: Friends of LABoral, <10 years old, journalists, members from ICOM (International Council of Museums)
Days of free admission: All Wednesdays of the year plus 18th May (International Museum Day)

Joined tours Ciudad de la Cultura:
General fee: 6,00 €
Reduced fee: 4,25 €

SERVICES

Info LABlounge

Lounge area in lobby for browsing publications.

LABdesk

Information and admission in lobby. The Centre provides audioguides and guided tour services in several languages for the exhibitions.

LABcloakroom

Free cloakroom service for all visitors.

Labshop

LABoral has a shop on the ground floor where visitors can find written materials published by the Centre as well as limited edition original objects. You can also purchase on line.

Projects Office

LABoral Centro de Arte y Creación Industrial puts its Projects Office at the service of the cultural sector. The Projects Office welcomes new proposals on a permanent ongoing basis. Proposals received will be assessed by an Experts Committee for possible production and later exhibition at the Centre. The initiative is a response to LABoral´s goal to encourage the production of art projects and their introduction in professional art circuits.