

Art, Multiplicity and Awareness

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Undeniably we live in a historical age which shows a wide art diffusion. Art is one of the most inflated words, and although we may think it is not enough, art permeates almost every realm of our culture and our expressions. Artistical production is often performed in mass media contexts and channels. There are major events, like the Venice Biennale, like ARCO or like monographic exhibitions on art masters of the past which are mediatic events before being cultural events, which attract thousands of people, if not hundreds of thousands¹, whose large majority are art amateurs. Art is also a form of economical investment with a solid although risky market, and experts encourage new investors and say that this market is growing².

This democratization of the art world in the sense Walter Benjamin outlined³ has lead our culture to a pervasive spreading of art ideas, but often simply reduced to styles, exteriority, behaviours, moods, fashions, communications, publicities. And the spreading of the art culture has enforced the awareness of what we can call the cultural and economical power of the art realm, which, especially in the latest decades, seemed to assume under its wings almost every new form of expression. Let's think here for instance of video art, computer art, art holography, interactive art, net.art, and so on...

¹ For instance the Venice Biennale attracted 243 thousands visitors in 2001 and 260 thousands in 2003. From <http://www.labiennale.org/en/biennale/history/4.html>

² See “The art market”, http://www.economist.com/finance/displayStory.cfm?story_id=3503888; “Art Market Watch”, <http://www.artnet.com/Magazine/news/artnetnews/artnetnews3-11-02.asp>; Nomisma, *Laboratorio sul Commercio dei Beni Artistici*, November 2004, <http://www.nomisma.it/upload/20041126-002.pdf>.

³ See Walter Benjamin, *Das Kunstwerk im Zeitalter seiner technischen Reproduzierbarkeit*, Frankfurt am Main, Suhrkamp Verlag, 1955. In English, in a recent edition: “The Work of Art in the Age of Mechanical Reproduction”, in Howard Eiland, Michael W. Jennings (eds.), *Walter Benjamin: Selected Writings, Volume 3, 1935-1938*, Cambridge MA, Harvard University Press, 2002.

The art's overturning

The spreading of art has lead to weaken its identity, so we assist to a sort of overturning. By the second half of the Nineteenth Century photography had to assume some of the styles of paintings and emulate pictures to become art, in order to share the power of imaging and representing. Baudelaire, who had understood the “natural alliance of photography with multitudes”, wrote in 1859 his famous letters to the *Revue Française* in defense of art⁴, which he feared would have been “ruined and substituted by photography”. We know that history went otherwise and that photography did not replace paintings but went alongside them. Only painting applications that photography could achieve better disappeared, like, as Walter Benjamin still recalls⁵, the miniature portraits, because photography could make them more reliably similar to the original subject and at a cheaper price. Instead, painting had to refocus its language, starting on the path which lead it to abstraction, that is precisely what photography cannot achieve. In fact a photograph is made by a process of recording the light reflected or emitted by the subject⁶. A photograph can be defined as a *trace* of the subject which it represents, because it is never possible to avoid the actual presence of its reference during the process of image achieving: without a subject which reflects or emits light during the shooting, there is no photography (according to Roland Barthes⁷, photography is a proof of reality; in front of a photograph I can never deny that what is in the image has been – for some occurrence, in some moment of its life, for some reason – in front of the objective). This is also true for photomontages, with the difference that it can be said for each photographic part of the image. And although photography can be considered a proof of reality, a photograph, like any other signs, can have no relation with truth, that is, as we know, a photograph can lie (which is precisely a definition of sign in semiotics).

What has been previously said can be of some use to understanding the rising of a new medium and its settlement inside the mediascape, the realm of the existing media. Every new medium evolves from an early self referential stage, especially keen on its language and on technical processes, to a mature stage where technics tend to become transparent, and allow the user to concentrate on the results, the goals. Any new media expands the mediascape – adding more chances of expression and communication – and steals space from the other media where it possibly works better than them, forcing the other media to refocus and redefine their languages. So the mediascape is in an endless adjustment state, or in a *remediation* process as Bolter and Grusin call it⁸, both because of the evolution of its inner media and because of the arrival of the new media.

So, to get back to our overturning, if in the past any new media had to emulate paintings to equal art's heights, in recent decades we often assist in the opposite: traditional art which emulates and takes inspiration from media events, mass communications, new media⁹. This is not negative *per se*, of course, but enforces the idea that maybe a better way of interpreting our current world and culture is achieved by art forms which use media and technological instruments. And exemplify the idea

⁴ From Charles Baudelaire's letters to the director of the *Revue Française*, published in June, 10 and 20, 1859, during the “Salon de 1859”, which opened at the Champs Élysées on April, 15 1859.

⁵ See Walter Benjamin, *op.cit.*

⁶ See Pier Luigi Capucci, *Realtà del virtuale. Rappresentazioni tecnologiche, comunicazione, arte*, Bologna, Clueb, 1993.

⁷ Roland Barthes, *La chambre claire*, Paris, Éditions du Seuil, 1980.

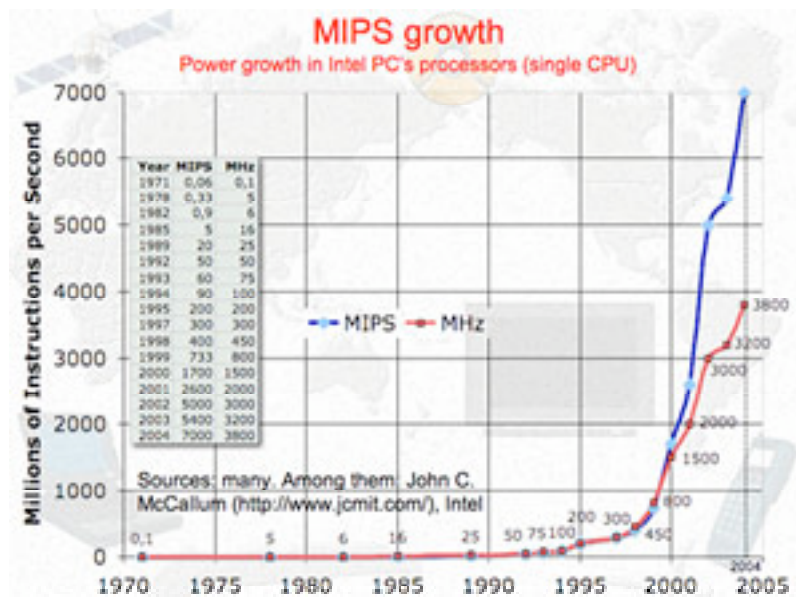
⁸ Jay D. Bolter, Richard Grusin, *Remediation: Understanding New Media*, Cambridge MA, The MIT Press, 2000.

⁹ Pier Luigi Capucci, *Arte e tecnologia. Comunicazione estetica e tecnoscienze*, Bologna, Edizioni dell'Ortica, 1996.

that media and communications are today a crucial topic for art.

A quick look at information and communication technologies

Maybe it can be useful to give a quick look at information and communication technologies, which are basically, although not only, digital based technologies. The advent of the microchip in 1971, by Intel, and hence the birth of the Personal Computer in 1976, by Apple, lead to evolving handy, flexible, general purpose, highly standardized and cheap machines. Especially in the last decade computational technologies have grown incredibly in power. [slide1]



This slide represents the spectacular growth of the computing power in the Personal Computer area (with one CPU), expressed both in MIPS (Millions of Instructions per Second, in blue) and in MHz (in red), starting from the invention of the microchip in 1971. This power growth rate has even been overcome by the evolution of the video boards, which today allow us to flawlessly work with images, video, multimedia, videogames, three dimensional graphics on larger monitors and at higher resolutions.

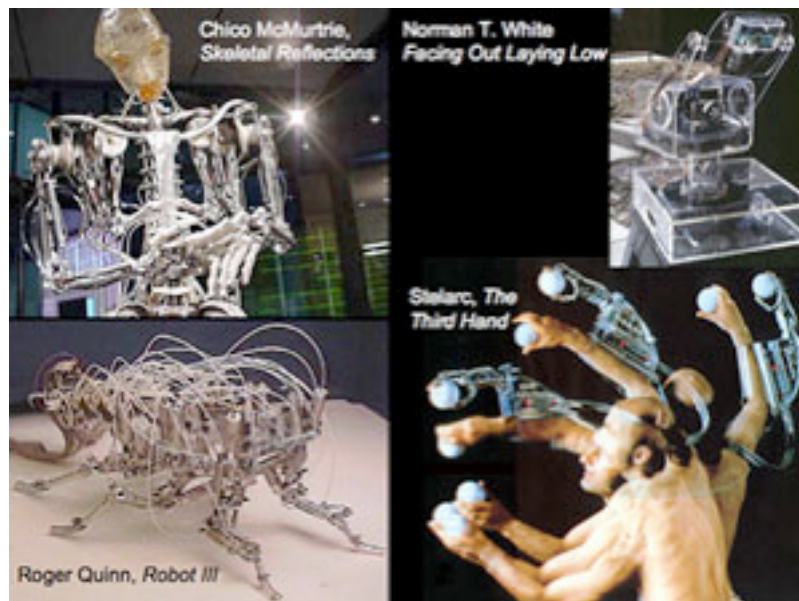
The Personal Computer area is most interesting for us and for artists too especially for being economical. But to give a more general idea of power computing growth, I can recall that *Deep Blue*, the machine which in 1997 defeated the chess world champion Gary Kasparov, had a computing power of roughly 3 millions MIPS, while one of today's most powerful supercomputers, the *NEC Earth Simulator* with 4096 CPUs, reaches about 30 millions MIPS.

One of the most complete and interesting studies about power computing trend, especially compared to the human brain power and the evolution of robotics, was made by Hans Moravec¹⁰, one of the most prominent scientists in this field. In his studies he

¹⁰ Hans Moravec, "When will computer hardware match the human brain?", *Journal of Evolution and Technology*, vol. 1, 1998. <http://www.jetpress.org/volume1/moravec.htm>

See also Hans Moravec, *Mind Children: The Future of Robot and Human Intelligence*, Cambridge MA, Harvard University Press, 1989.

foresees an evolution of robotics which in about fifty years from now will lead robots to surpass humans and progressively substitute them in all activities, leaving humanity suspended in a sort of limbo. These robots, that Moravec calls “the children of our minds” because they are the legitimate sons of our culture and no more of our biology, will evolve towards new conquests leaving humans in the dust. Although we may or may not agree with Moravec, undeniably robotics is going to become one of the hot sciences in a near future, posing huge questions about philosophy, ethics – both for humans and robots –, society, about the obsolete distinction/opposition between “natural” and “artificial”, and highlighting new approaches to the meaning of knowledge, life, biology, intelligence... And also artists started to work around these ideas, in many ways. [slide 2]

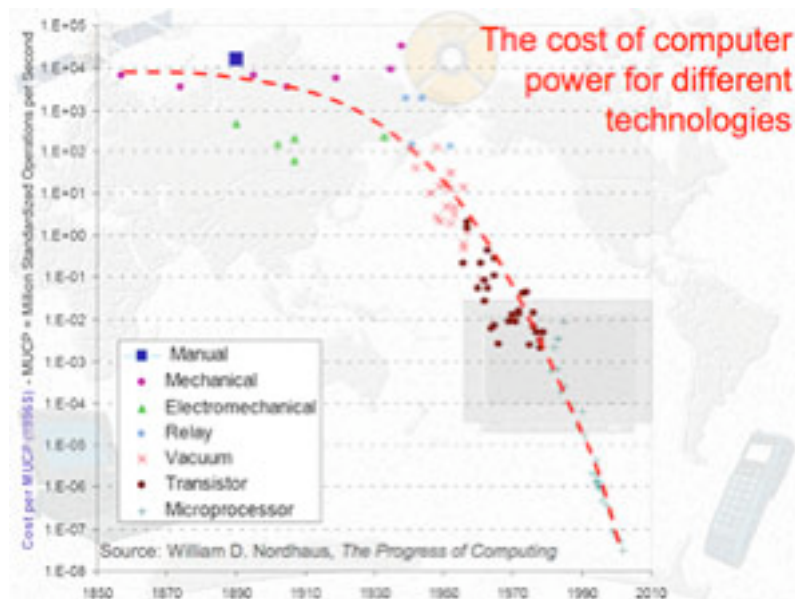


These and other technological acquisitions also lead to reconsider the role of the body, since sciences and technologies raise new possibilities of acting on the body's physiology, psychology and appearance. But what is even more important is the body's centrality in the cognitive processes raised by the biology of knowledge and robotics approaches¹¹. A new paradigm which recomposes the historical “mind *vs* body” opposition into a unitary and indivisible system, so undermining the famous cartesian statement “cogito ergo sum”, which in its consequences is still a pillar of our culture.

To get back to computers, the experts think that the exponential-like growth of calculation power will hold at least for a decade from now, possibly using different computing technologies (multicore, multiprocessing, clustering, optical technologies), and, in an unpredictable future, maybe also quantum computers.

But this growth in power would be of almost no interest for us without the decrease of calculation costs. [slide 3]

¹¹ See Maturana and Varela's work, and, before, Maurice Merleau-Ponty's approach in *La structure du comportement*, Paris, Presses Universitaires de France, 1942. On the biology of knowledge see in particular Humberto Maturana, Francisco Varela, *El árbol del conocimiento*, Santiago de Chile, Editorial Universitaria, 1984. On body-technologies issues see Pier Luigi Capucci (ed.), *Il corpo tecnologico*, Bologna, Baskerville, 1994. Among the many exhibitions on these topics, see in particular “Digitized Bodies – Virtual Spectacles”, curated by Nina Czegledy, a travelling exhibition held in 2001-2002 (<http://www.digibodies.org/>).



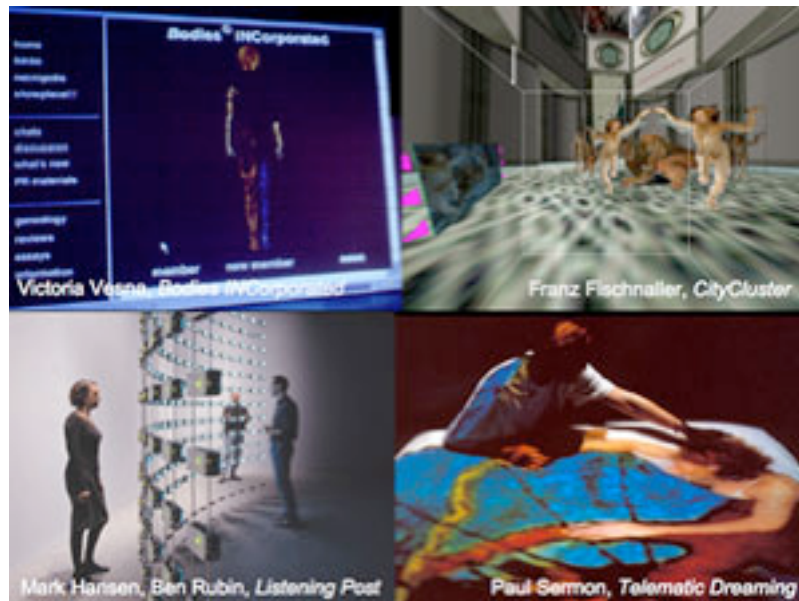
This graph by William Nordhaus¹², in some way specular to the first, shows that the power calculation has become cheaper and cheaper, spreading the use of computers as everyday tools. Moreover, since the microprocessors costs are continuously lowering and chips do not add significant costs to the objects which they can be added to, chips – and often dozens of chips – are embedded into any common objects and means: cars, watches, washers, toasters, telephones, TVs, toys, photo and video cameras, Hi-Fis, VCRs and DVDs, faxes, household appliances... And chips are also in artificial prosthesis or are implanted in human bodies. A population of obscure and obedient entities which untiredly work in a discreet and invisible way.

Another main acquisition of our culture is the so called “real time information”. Before the birth of the telegraph the information could be carried at a speed which had the same numerical order of the speed of humans, animals and things. Today people and things can be pushed to some thousands kilometers per hour, but the information instead can approximately reach the speed of light: that is today the information can be pushed to a speed which is about five hundred thousand times quicker than the speed of people and things¹³, and with a transfer cost which is much less expensive. And it should be noted that the human kind has achieved this relevant goal in roughly only two centuries of evolution.

On wired and wireless “real time information” many of the telecommunication tools we currently use or that every day keep us informed are based, with applications from telephony to television, from Internet to telepresence, from wireless networks to mobile communications... Many artists, with different approaches and objects, use these instruments in their works. [slide 4]

¹² See William D. Nordhaus, *The Progress of Computing*, March 4, 2002, version 5.2.2, http://www.j-bradford-delong.net/movable_type/refs/prog_030402_all.pdf, p. 43.

¹³ See Pier Luigi Capucci, “Tecnologie del vivente”, in Mario Morcellini, Michele Sorice (ed.), *Futuri immaginari*, Rome, Logica University Press, 1998. Also published in *Noema*, http://www.noemalab.org/sections/ideas/ideas_29.html and http://www.noemalab.org/sections/ideas/ideas_30.html



In this field there is also the evolution of an art of online cooperation, which roots are in the hacker philosophy, based on knowledge and resources condision, on peer participation, on collective working, which shows a totally different approach to the traditional art making and questions the classical artist's figure¹⁴.

Of course there should be many other topics worth discussing in the trend which lead computing systems from machines for a tecno-economical elite to simple tools for common people and artists ("the computer for the rest of us", as once Steve Jobs, one of the inventors of the personal computer, said). Here I can at least briefly recall the evolution of "user friendly" operating systems, the evolution of software and of graphical interfaces (GUIs), the proliferation of cheap peripherals for many tasks, the interoperability of many standards.

But although this process may seem in someway extraordinary, we are still in a sort of "stone age" of computing. In fact some experts, like for instance Michael Dertouzos, claimed about an "unfinished revolution" of information technologies, and on the desirable advent of an "anthropocentric informatics"¹⁵, that is an informatics centered on people instead of on machines, where computers should understand humans and not, as today happens, where humans have to understand computers. It is a vision which for many reasons has still a long way to go, and where informatics has to work in conjunction with other disciplines, like artificial intelligence. Other experts instead turn their interest in discussing on friendliness, ergonomy, usability – and we could add "transparency" – of machines use and software¹⁶.

And, of course, what is most important, we are in the "stone age" of computing also because only less than 10% of the World population can have access to these technologies, as cheap and "user friendly" as they may be.

¹⁴ In 2004 this concept was discussed in the international conference "Networks, Art & Collaboration", organized by Geert Lovink and Trebor Scholz at the Department of Media Study, The State University of New York, at Buffalo <http://www.freecooperation.org/>

¹⁵ See Michael Dertouzos, *The Unfinished Revolution*, London-San Francisco, HarperCollins, 2002.

¹⁶ Among the many texts on these topics see Donald Norman, *Defending Human Attributes in the Age of the Machine*, New York, Voyager, 1994 (CD-ROM); Of the same author: *The Invisible Computer*, Cambridge MA, The MIT Press, 1998. Jakob Nielsen, *Designing Web Usability*, Macmillan Computer Publishing, 2000. Jef Raskin, *The Humane Interface*, Reading MA, Addison-Wesley, 2000.

Art and interactivity

One of the consequences in art of the technological trends previously outlined is interactive art. With technological instruments artists can give a sort of life to their works. Artists can easily and quickly manage and modify the dynamics of the artworks, give them a memory of their logic states, of their operating conditions and of their behaviour. Artworks react to the environments they are put into, acquire a sensibility to the world and to the presence and activity of the user. Real interactive artworks can modify their morphostructure in response to the user's behavior and to the environment. The former classical and passive viewer or spectator becomes an active participant and sometimes a co-author of the artwork. The artwork shifts from the status of a closed object to the status of an open process of biunivocal relationships: the artwork itself resides in the interaction process, without which it is only hardware with a little or no artistic interest. And since interactivity varies because of the users' behaviour and because of their psychological and physiological states, the final artwork – the result of the interactive process – can never be completely predicted¹⁷. Hence the artwork is not based on *identity* – on a morphostructure which is stable and unchangeable, like that of a picture or a sculpture – but on *difference* – on a morphostructure which is unstable, metamorphic and ever changing. [slide 5]



Since these artforms are defined by the interaction with the user and the environment, the best suited places for their exhibition do not appear to be the traditional artplaces like museums and galleries. With some remarkable exceptions museums and galleries, as they normally work, are usually closed spaces, with a specialized public who is aware of and respects the physical distance requested by traditional artworks. Museums and galleries generally require “spectators” and not “participants”, “viewers” and not “users”. In these spaces traditionally devoted to art, there is a symbolic, cultural and sacral distance between the user and the artwork. A distance which can only be crossed with the eyes and the mind, while the artwork can only be contemplated and must never be touched or – worse – modified in order to preserve its main artistic value: the originary intention of the artist.

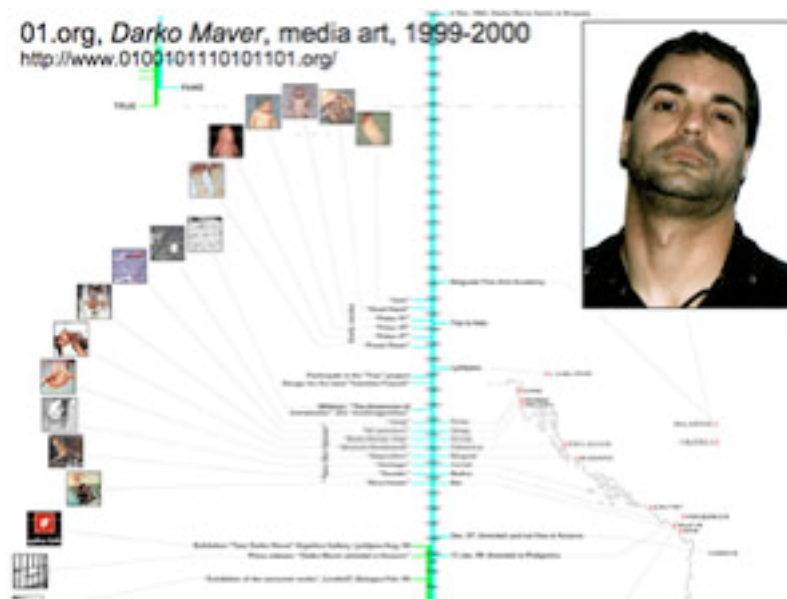
¹⁷ See Roger F. Malina, “The Beginning of a New Art Form”, in Hannes Leopoldseder (ed.), *Der Prix Ars Electronica*, Linz, Veritas Verlag, 1990. Also Pier Luigi Capucci, *Arte e tecnologie. Comunicazione estetica e tecnoscienze*, op.cit.

So maybe interactive artforms are better suited for places where interactions can get a higher quantitative and qualitative probability to take place: the social environment, the public spaces, the infosphere of communications, the Net. Or we have to invent new museums and galleries. Once Peter Weibel defined as “contextual art”¹⁸ these artforms sensible to and modifiable by the human and the environmental context. These forms of expression expand the chances of art thanks to the participation of the user, thanks to their social dimension and their versatility in communications, so recalling the utopias of a “diffuse aesthetics”¹⁹.

Art and communications

As we know, art could be defined by a sort of tautology: “art is what a society – a culture – decides to be art”. But in a world where from Duchamp onward literally anything can become “art” all the gaps tend to vanish. And the more the artfield broadens, the more art becomes uncertain, weak, contradictory. So mass media and mass communications become relevant in deciding what art can be and what it cannot be.

To exemplificate this concept let me present you one work, the *Darko Maver Project* by 01.org. As you may know, 01.org²⁰ is a duo working in the realm of media activism. In 1998 01.org invent an artist, Darko Maver, whose name is the real name of a Slovenian criminologist, gave him a birthplace (near Belgrade), a very detailed biography²¹, and a corpus of artworks, sculptures, performances, exhibitions and writings. [slide 6]



Briefly, Darko Maver was abandoned at eight by his parents and after being hosted in an orphanage was adopted by the family of an arms dealer. He studied at the Fine Arts Academy of Belgrade and his artworks and performances are violent, macabre, politically oriented, they show injured bodies, hypersimulations of violent murders. His artworks are reviewed in Yugoslavian newspapers and magazines which discuss Maver’s poetics, and since artists often theorize on their work, Darko Maver also

¹⁸ See Peter Weibel (ed.), *Kontext Kunst*, Köln, 1994.

¹⁹ See Filiberto Menna, *Profezia di una società estetica*, Milano, Lerici, 1968.

²⁰ See <http://www.0100101110101101.org/>

²¹ F.A.C., *Darko Maver Biography*, first published on the Internet, 1998.

becomes a poet. [slide 7]



Of course everything was invented. At the beginning there was a website with Darko Maver's curriculum. The artworks images were "actually photos of real crimes, horrifying images of corpses available on the Internet on websites like www.rottent.com, at the disposal of anybody whom has guts enough to watch them"²², and no magazine ever published about Maver. But everything was packaged for the media and the art realm, and in the summer of 1998 Maver became a "real" artist, with a series of exhibitions.

The story goes on: in October 1998 Darko Maver is imprisoned in Podgorica because of his anti-patriotic behaviour. [slide 8]



This has the effect of enhancing media coverage and opening some new exhibitions on his work. Specialists and art critics discuss his "provocative" work and poetics in newspapers and magazines, Darko Maver becomes a sort of dark and mysterious martyr of truth. [slide 9]

²² http://www.0100101110101101.org/home/darko_maver/story.html



So, when the situation in Kosovo breaks with the NATO intervention in the Balkans, for Darko Maver it's time to die, following his destiny, channelled by the media, of a damned icon living in a damned world, of an *artiste maudit*, a romantic idea which is perfectly suited for the artworld. In fact on May 15 1999, a laconic communicate with a photo of the body is sent to the press agencies announcing Maver's death in the prison of Podgorica. [slide 10]



The photograph, actually taken in a garret in the center of Bologna, rapidly circulates on the Internet and the press, and Darko Maver becomes a myth, dead under mysterious circumstances (Homicide? Suicide?), in a sort of last tragic performance in perfect synchrony to his work. Celebrations start with articles and exhibitions which culminate in an official invitation to the 48th Venice Biennale, where on September 23 an installation is presented to a large public with a documentary on the artist. [slide 11]



The real artwork, the art and media swindle, has come to its conclusion. At the beginning of 2000, in a long press release entitled “The Great Art Swindle. Do you ever get the feeling you're being cheated?”²³ 01.org reveal the fake, together with a photograph in which Darko Maver resurrects in the room where he was found dead. [slide 12]



This story can somehow exemplify how the art realm works today. What is often exhibited is not only – and sometimes not at all – the artwork itself, but the communication it evokes and which it is evoked from. We could say that, at least from the rising of the avantgardes in the second half of the 19th Century, the artworld has always worked in such a way. In the end, what are art critics and historians, museums and galleries, press offices, collectionists, amateurs, art events and exhibitions, art magazines, art merchants, academies and universities, if not also a wide, complex and articulated communication system which presents, contextualizes, promotes and possibly sells the artworks? But the difference with today maybe is that

²³ See 01.org and Luther Blissett disclosure, *Noema*, http://www.noemalab.org/sections/ideas/ideas_articles/maver.html

in the past at the beginning there was a real object to exhibit, document, contemplate, investigate, acquire, sell... Everything started from the real presence of that object. In the 20th Century, as the mass media progressively grow in power and diffusion the avantgardes progressively centralize the idea, the event, the project and its communication instead of the object, and in the end they disappear. Today, in the global communication era, the art object tends to vanish, its centrality is taken up from communications, it is substituted by communications to an extent that the art object can be simply an accessory or it may not even exist: today in the beginning there are communications. This trend is encouraged by technological media, which almost by definition tend to emphasize processes, information and communication processes. In the case of Darko Maver some galleries continued asking for his artworks also after 01.org declared he was a fake, although they knew that all the Darko Maver world was an invention. If they were interested in either showing the fake and its mediality or the 01.org media project, in any case they would have showed pure communications.

As I recalled before, “art is what a society decides to be art”. In our society of communications, especially mass communications decide what art is and what it isn’t, who an artist is and who she or he isn’t. And, more, mass communications can decide to be art. Yes, as we noted before, art has become more popular, “democratic”, but has reached this goal relying on communications. An italian philosopher, Mario Perniola, recently published a book entitled *Contro la comunicazione*²⁴ (*Against Communications*). With “communications” he actually means “mass communications”, which he defines as “the opposite of knowledge”, “the enemy of ideas” because communications tend to dissolve all the contents they deal with under an appearance of democracy and progressivism in directly addressing to people, while indeed they constitute a populist obscurantism²⁵. Mass media communications influence politics, culture and art. They are undetermined because they tend to be one thing, its opposite and what lies in between the two. So, Perniola states, communications are much more totalitarianist than the traditional political totalitarianisms because they comprehend also antitotalitarianism. Communications are global in the sense that they also include what denies globality²⁶.

So, to come back to us, have culture and art to be slave of communications? Has art to be managed and directed by the mass media and by the interests they pursue? In his book Perniola reaches a conclusion, which may not sound new but which is argued in a practical way: the only possible alternative to communications’ power are aesthetics and art, in their applications into real life. An alternative to the communication effects has to be found in an aesthetical feeling of things which is neither too far from the real needs and expectations of the individuals nor slave to the idolatry of immediate money and success. I think that the *Darko Maver Project* as well as other projects of artists working in the media field go in this direction, especially when they work at a wider, global level, like for instance, to cite another 01.org project, the *Nike Ground*²⁷. [slide 13]

²⁴ Mario Perniola, *Contro la comunicazione*, Torino, Einaudi, 2004.

²⁵ *Op.cit.*, p. 6.

²⁶ *Op.cit.*, p. 9.

²⁷ See <http://www.0100101110101101.org/home/nikeground/index.html> and <http://www.nikeground.com/>



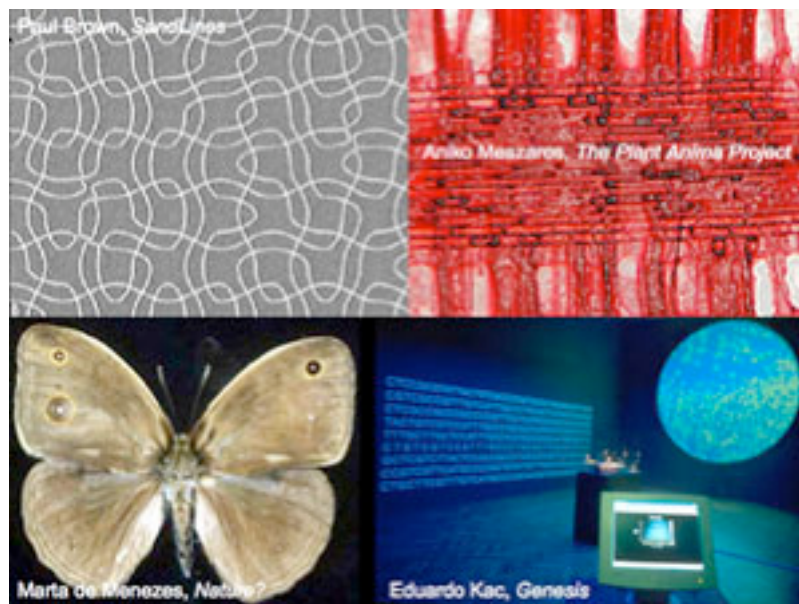
Publicity has always considered the artfield as an immense and free deposit of ideas, concepts, styles to use and often to sack. Why shouldn't art do the opposite, that is reuse publicity logos, mass media icons, marketing and communication techniques? The art of the 20th Century showed some remarkable examples in this direction (for instance collages, Dadaism, Pop Art, just to cite some), but undeniably net.art and media art give a new power to this topic, especially when they dismantle the languages and the logic of the communication establishment.

Some new fields for the artists

Although my intervention has been mainly focused on communication and art, I must recall that 2005 is the Year of Physics, and more generally, the year of science. In 1905, one hundred years ago, Albert Einstein wrote three important studies which posed the basis of modern science and which deeply influenced philosophy and technologies in the 20th Century. The first article was on the Brownian Motion and explained the apparently inexplicable motion of small particles suspended in a fluid, demonstrating that it is caused by the continuous striking of the molecules in the fluid on the particles. This writing opened the doors to the atomic and corpuscular theory of matter. The second article was on the Photoelectric Effect, and signs the beginning of the dualism wave-particle, of the light quanta that later would be called photons. The third article is on the Restricted Relativity, and ties the idea of time to the observer's motion and to the space/time structure. Although these ideas may seem far from everyday life, they gave birth to many technologies and tools we currently use, and which are used by artists. The Photoelectric Effect is at the basis of solar cells and of luminosity sensors in automatic devices and digital cameras. The stimulated emission of radiation is at the basis of the lasers, and gave birth to holography and to all such common devices like CD/DVD-ROM readers and writers, optical trackers and mice. The Restricted Relativity gives the necessary corrections in the making and working of Global Positioning Systems (GPS) mounted in cars, in palmtops, in PDAs and shortly in mobile phones.

Artists have always demonstrated they can use, discuss and enrich science and technology. And as "free spirits", as once Pierre Restany defined them, artists can both show us our inner dreams come true and raise a radical criticism on technologies' use. They can both give us awareness and possibly initiate a reflection on ethics, on the

technologies' impact on culture. [slide 14]



Artists have many paths today to investigate, and I'll quickly outline here a few which I think can be particularly interesting:

Robotics. It seems this century will be the century of robotics (and of communications). Besides all the reflections about conscience, evolution, social impact, this must lead to a sort of roboethic²⁸, and rediscover the anthropological positivity of the term “artificial” applied to technologies, as expression of freedom. There is a wide discussion running on these topics and we are preparing a special issue on robotics and art on our web magazine *Noema*²⁹.

Artificial life³⁰. Only some basic questions. Has carbon-based life only to be considered? What does life mean? How life can be defined? What are the borders between what can be considered as life and what cannot be defined as living?

Biogenetic, genomic and biotechnological art³¹. These are other hot topics with plenty of consequences, possibly even wider and more problematic than the ones raised by robotics, because they act on the basis of animal and human life and work on what we can call the “long term memory”. And sometimes the artists working in this field are discouraged or even opposed by the establishment, as some recent cases show³².

Indeed there are very interesting working realms for the artists, and, as far as I can see from today's works on these topics, I am sure I shall enjoy their research and they will help me to understand my time. Again.

²⁸ Gianmarco Veruggio, “Io, robotico”, *Le Scienze*, n. 434, October 2004.

²⁹ <http://www.noemalab.org>

³⁰ On the birth of this discipline see Charles G. Langton (ed.), *Artificial Life*, Reading MA, Addison-Wesley, 1989. Also Charles G. Langton, C. Taylor, J. D. Farmer, S. Rasmussen (eds.), *Artificial Life II*, Reading MA, Addison-Wesley, 1992. Domenico Parisi, “Vita artificiale e società umane”, *Sistemi Intelligenti*, Year VII, n. 3, December 1995.

³¹ See Jens Hauser (ed.), *L'art biotech*, Nantes, Filigranes Éditions, 2003. Many thanks to Franco Torriani for this rare catalogue.

³² It is, for instance, the case of the Critical Art Ensemble. About CAE see <http://www.critical-art.net/> and <http://www.caedefensefund.org/>

Thank you for your attention.

Images' references

Slide 2

Chico McMurtrie

<http://www.fundacion.telefonica.com/at/vida/paginas/v4/skeletal.html>

Roger Quinn

<http://biorobots.cwru.edu/>

Stelarc

<http://www.stelarc.va.com.au/>

Norman T. White

<http://home.golden.net/~sambi/machine/>

Slide 4

Franz Fischnaller – FABRICATORS

<http://www.fabricat.com/>

Mark Hansen, Ben Rubin

<http://www.earstudio.com/projects/listeningpost.html>

Paul Sermon

<http://www.medienkunstnetz.de/works/telematic-dreaming/>

Victoria Vesna

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Rafael Lozano-Hemmer

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Paul Brown

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Marta de Menezes

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Eduardo Kac

<http://www.ekac.org/>

Aniko Meszaros

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