ARS ELECTRONICA

NEW VIEWS OF HUMANKIND

BEGINNING JANUARY 2, 2009 IN THE ARS ELECTRONICA CENTER

OPEN HOUSE: January 2-4

www.aec.at

Bild: Ars Electronica Futurelab

LOCAL & INTERNATIONAL COLLABORATION

The New Ars Electronica Center

Molecular biology and genetic engineering are decoding the building blocks of life, manipulating them and creating artificial life forms. Imaging procedures are revealing processes taking place within our body and observing our brain while it thinks ... Technology and research are opening up insights that go far beyond what the naked eye can see. The findings that are emerging along with these images are changing our picture of the world and the way we regard our own species. NEW VIEWS OF HUMANKIND, the theme exhibition debuting in the Ars Electronica Center on January 2, 2009, is dedicated to the startling advances being made in the so-called life sciences. Four laboratories constitute this exhibition's core: BrainLab, BioLab, RoboLab and FabLab. Their extraordinary experimental arrays are designed to engender an active approach to explosive issues.

ART & SCIENCE

Like no other museum in the world, the new Ars Electronica Center showcases the interplay of art and science. Staging exhibitions, conducting research activities and running a program imparting knowledge & skills are no longer separate strands; at the AEC, they're completely intertwined. The watchwords: interaction and experimentation opening up new realms of ideas and images. Joint ventures with top-name research institutions in Austria and abroad sustain this facility's strong scientific orientation; collaboration with artists opens up unaccustomed perspectives. The new Ars Electronica Center presents worlds of imagery that are normally reserved for experts in the respective fields. Visitors to BioLab can experiment with raster electron and fluorescent microscopes. The FabLab makes available a laser cutter and a 3D printer. In RoboLab, there's a computer that can be controlled by thoughts. And the BrainLab's functional magnetic resonance imaging technology lets visitors observe their own brain while it's thinking.

OPENING ON JANUARY 2, 2009

The new Ars Electronica Center premiers on January 2, 2009. The opening ceremony kicks off at 11 AM; thereafter, invited guests will get a first glimpse of the new facility. An OPEN HOUSE with free admission for the general public gets underway at 2 PM. Quickie journeys of discovery and a feature-packed program of performances provide an initial glimpse into the world of experience inside the new Ars Electronica Center. The lineup continues on January 3 & 4, from 10 AM to 6 PM both days. Info about the opening program in the new Ars Electronica Center is available online at www.aec.at.

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Press Conference
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IN THE BRAINLAB

Some experts classify the human brain as the universe's most complicated system–100 billion nerve cells, and every single one connected to approximately 10,000 synapses. A gigantic network that controls our body and our sensations. The BrainLab takes a close-up look at the human brain and, in doing so, focuses how we perceive reality.

EYETRACKER

by Bernhard Fink (DE) / University of Göttingen

It's taken millions of years for the human brain to reach its present form and to acquire its current capabilities. Instincts and modes of behavior that once assured the survival of our kind are still stored in memory. Bernhard Fink is a behavioral biologist at the University of Göttingen, where he conducts research on this evolutionary legacy. Now, the Ars Electronica Center's EYETRACKER sheds light on his work. A test subject watches an image and a camera registers his/her eye movements. The resulting data are evaluated by a computer, which shows exactly what attracts a person's attention: Which points we concentrate on (fixation); among which points our glance jumps back and forth (saccade); and how long our glance remains focused on a particular spot (duration).

SEE++

by Siegfried Priglinger, Michael Buchberger, Thomas Kaltofen / RISC Software GmbH, Medical Computing Research Department

SEE++, 3D software developed in Upper Austria, simulates the sequence of movements of the human eye. Physicians can use it to individually model a patient's strabism (squinting) and determine the optimal treatment procedure, which can also be three-dimensionally visualized by computer. SEE++ is utilized by many clinics worldwide to diagnose and treat eye motility dysfunction, as well as to provide training and continuing professional education for surgeons and hospital staff.
SEE-KID (Software Engineering Environment for Knowledge-based Interactive Eye Motility Diagnostics) is a research project being conducted at RISC Software GmbH's Medical Computing Research Department. RISC Software GmbH is a non-profit organization wholly owned by the University of Linz and the UAR–Research Institute of the Province of Upper Austria.

fMRI STATION

by Franz Fellner / Linz General Hospital & Siemens Austria

The new Ars Electronica Center's one-of-a-kind fMRI STATION lets visitors experience real live brain scans. The Siemens Austria workstation is directly linked to the Radiology Department of Linz General Hospital. Regular live video conferences provide a foretaste of the future of telemedicine. Furthermore, in conjunction with the AEC's Artist-in-Residence Program, this facility will give artists the opportunity to create completely new graphic worlds.

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Magnetic resonance imaging (MRI) is a modern medical imaging procedure. The human body is subjected to a magnetic field to which each type of body tissue reacts differently. The visible result is a cross-section image of our tissue and our organs. A special form of MRI is functional MRI (fMRI). It delivers images not only of the brain but of its activities as well. The region of the brain active at any particular moment has a greater need for oxygen, and this, in turn, requires an increased supply of blood. The oxygen-rich blood delivered to that region has different magnetic properties than blood whose oxygen has already been used and is thus being returned for re-oxygenation. The active brain regions that are made visible in this way can thus be precisely positioned on the anatomical image of the brain produced by the MRI.

HAPTIC RADAR

by MetaPerception Group, University of Tokyo

HAPTIC RADAR is a headband with optical "feelers" that permanently scan their surroundings. The respective distances measured thereby are translated into vibrations of differing intensity that can be felt by the skin. The result is a tangible "picture" of the environment. Developed at the University of Tokyo, HAPTIC RADAR opens up a completely new experience of space. Potential applications include visual prostheses and obstacle recognition systems for automobiles.

BRAIN-COMPUTER INTERFACE

by Christoph Guger / g.tec medical engineering GmbH

A single thought ignites a veritable fireworks of electrical signals in our brain. These signals are the means of communication of the neurons located there. Electronencephalography (EEG) can "eavesdrop" on these conversations. To do so, metal plates (electrodes) are first applied to the scalp. They measure the electrical activity of the nerve cells. These readings are analyzed by computer and depicted as an electroencephalogram. Thanks to EEG, it's been possible for the last 80 years or so to investigate a living brain without performing surgery–a true revolution in brain research. Today, EEG is used above all to diagnose brain injuries and tumors as well as epilepsy, to establish brain death and the depth of a coma or anesthesia, and is also used in sleep research.
With the BRAIN-COMPUTER-INTERFACE, Christoph Guger and the Ars Electronica Center raise the prospect of potential future scenarios–for instance, EEG as the linkup between human being and computer. Example: Think of a word–EEG, for instance. A computer then displays one letter after another. When A comes up, nothing happens. The same with C. But as soon as E appears, the brain's neurons fire. The same occurs with the next E and then with the G. Finally, the computer analyzes which letters triggered neuronal reactions, and concludes that the word EEG is what the user means.

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IN THE BIOLAB

There is probably no field that has launched such heated debates as genetic engineering. The very fact that it has become–technically–feasible to intervene in a person's basic genetic makeup, to modify it, and even to clone a human being calls into question our worldview and our moral and ethical preconceptions. BioLab delivers insights into the inner structures of life, into the make-up of cells and DNA. And it also offers the opportunity to try out highly specialized equipment like a raster electron microscope.

BRANCHING MORPHOGENESIS

by Jenny E. Sabin (US)

BRANCHING MORPHOGENESIS combines the fascination of science with the beauty of an object of art. Inspired by the structures of cells, their fibrous interconnective tissue and the forces at work among them, the artist/researcher constructed a large-scale, walk-through sculpture consisting of 75,000 cable ties. Jenny E. Sabin is the first non-scientist on the faculty of the University of Pennsylvania's Institute for Medicine and Engineering, where she has been working together with Dr. Peter Lloyd Jones.

IN THE FABLAB

Think about this: you don't buy your sneakers in a sporting goods store any more; instead, you download them from the internet and simply print them out! A rather bizarre futuristic vision, but one that could soon become reality–with earth-shattering consequences for manufacturers and the whole economy. The Fab(rication)Lab is dedicated to the idea of being able to order digital objects from the Web and turn them out at home. And not (just) on paper, but as real objects. A 3D printer takes computer models and produces real things out of them; a computer-controlled laser cutter whips them up out of any material you choose. Clothing patterns or furniture designs will be obtainable via internet just like music and pictures are distributed today.

FLUID FORMS – INDIVIDUAL DESIGN

by Stephen Williams, Hannes Walter / FLUID FORMS

FLUID FORMS is a artistic duo that takes quite an original approach to implementing the idea of user-generated design. A punching bag studded with sensors becomes an easy-to-use tool–a formable model. The way the user "works it over" is transmitted to a computer, where software transforms the data into an individually formed designer object–for example, a lampshade. Once you've developed a design in this way, you can e-mail it to yourself at home and produce it via 3D pressure (selective laser sintering) that utilizes a laser and a powder mixture of plastic, metal, ceramic or glass. The laser heats the powder on precisely those points specified by the computer for the production of the object. In this way, the object is created layer by layer.

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ART+COM

The personal computer started to become really widespread in the mid-1980s. Even if it was initially used strictly as a tool for working with texts, spreadsheets and graphics, designers and artists associated with the UdK–Berlin University of the Arts and the ChaosComputerClub were aware even then of the computer's potential as a mass medium. The Web confirmed this only a few years later.
After some fledgling joint projects, the Berlin group formally established ART+COM in 1988. The aim was to carry out practical R&D on the medium's applicability in the fields of design, art, science and technology. Over the past 20 years, ART+COM has been at work on the leading edge of this medium's development, conceiving and bringing to fruition forms of communication, design principles and technologies that we now take completely for granted. As far as content is concerned, the spectrum ranges from works of art and design projects all the way to technological developments and inventions. With respect to form, the emphasis has been on four formats: screen-based applications, interactive objects & installations, medial spaces, and medial architecture.
In all these efforts, the focus has always been on the content to be conveyed and never on the technology itself. Though it's grown and become professionalized in the meantime, ART+COM's mission statement is the same as it was 20 years ago: to turn out innovative, unexpected, high-risk, experimental, interdisciplinary design projects that conceptually anticipate the future of medial communication. ART+COM – 20 YEARS OF MEDIA ART & MEDIA DESIGN is the Ars Electronica Center' retrospective look at 20 years of new media.

IN THE ROBOLAB

Some evince a striving for efficiency; others manifest a longing to create machines in our own image. It's the development of humanoid robots in particular that teaches us a lot about ourselves. What motion is. And what's intelligence. Or perception. In going about this, we recognize how highly developed we truly are, but also where we run up against our limitations. RoboLab delivers insights into the history of robotics and showcases the technical excellence of robots being created today.

EGGY BOY & 4D FISH

by Yoichiro Kawaguchi (JP)

It's not the slick, functional robots used in industrial production or R&D but rather the sometime quite klutzy humanoid robots that are beloved by so many people. The way they imitate our body and our sequences of movements exerts a fascination that's virtually irresistable. But when robots come to resemble us too closely, our enthusiasm quickly ceases and morphs into rejection or even fear. Uncanny Valley is the name scientists have given to this sudden decline in attractiveness on the part of extremely human-like robots.
Yoichiro Kawaguchi develops humanoid robot designs that take psychological, neurological and artistic aspects into account. This begins with purely external features such as cartoon-like bodies, short arms and legs, big eyes and soft skin, and

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includes seemingly emotional modes of behavior in certain situations. Here, Yoichiro Kawaguchi presents 4D FISH and EGGY BOY, two remarkable representatives of his colorful robo-collection.

EVOLTA

by Tomotaka Takahashi (JP)

17 centimeters tall and weighing in at 130 grams, the EVOLTA robot climbed a 530-meter sheer rock face in the Grand Canyon in 6 hours, 45 minutes. Panasonic's mascot embodies the playful-innovative approach of robot designer Tomotaka Takahashi. January 2-4, 2009, the little fellow will be doing a guest shot in the new Ars Electronica Center's 22-meter-tall Lobby.

MAGIC MOMENT

by Tomotaka Takahashi (JP), h.o (Yuichi Tamagawa), Ars Electronica Futurelab

Tomotaka Takahashi's FT and Manoi PF01 robots combine design artistry with leading-edge technology. The aim here was to counteract the cliché of robots as mere high-tech musclemen: big eyes and a broad forehead convey openness; the expansive chest radiates self-assurance. FT is one of the world's first female bipedal robots. Its slim feminine body was a real engineering challenge; the robo-lady has to be able to maintain balance while elegantly sauntering over the catwalk, and do so without any bulges indicating all the high-tech equipment hidden inside. In MAGIC MOMENTS, Tomotaka Takahashi and the Ars Electronica Center open up the possibility of interaction with these robots. MAGIC MOMENTS spans a bridge between the actual shadows of installation visitors and the virtual shadows of FT and Manoi PF01.

HALLUC II

by Shunji Yamanaka (JP) / Future Robotics Technology Center (Chiba Institute of Technology)

Halluc II is the high-tech prototype of a new generation of robots. Eight legs enable it to move in a variety of ways. Each individual leg is powered by seven motors; all legs feel out their surroundings and communicate with one another: 13 sensors measure distances and a pair of lasers detect obstacles. When overcoming an obstacle, Halluc II's legs are raised or lowered to compensate for the uneven terrain. This keeps the vehicle steady. Halluc II is steered by a central navigation computer that also evaluates the detailed information from the leg sensors. This enables the robot to independently, optimally adjust its mode of movement to the respective type of terrain. Someday, mobile robots like Halluc II will be used in conjunction with wheelchairs, cars and utility vehicles, as well as for rescue operations in difficult terrain.

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HYLOZOIC GROVE

by Philip Beesley (CA)

Canadian architect and artist Philip Beesley calls his sculpture "geotextile mesh." By this he expresses the combination of nature and technology within this electrokinetic intelligent machine. HYLOZOIC GROVE contains a dense net of proximity sensors, microcontrollers and actuators. When visitors come close, HYLOZOIC GROVE responds with waves of motion stirring the air and spreading over the whole structure. HYLOZOIC GROVE is based on shape memory alloy, so-called muscle wires. Similar to the way natural muscles pull and stretch, these artificial muscles can be returned to their original shape after being deformed by applying heat (via electricity) to the alloy (it "remembers" its shape). Artificial muscles are an alternative to conventional actuators such as hydraulic, pneumatic and motor-based systems. Shape memory alloys have numerous applications in the medical and aerospace industries.

LET YOUR MUSCLES PLAY

by Otto Bock Healthcare Products GmbH (AT)

Modern prosthetics design dramatically illustrates the tremendous innovation potential inherent in bringing together different fields of research. A combination of neuroscience and robotics is driving the development of prostheses that almost perfectly imitate natural sequences of movements. There are already prostheses that are directly connected to the muscles and nerves, and even implanting electrodes into the human brain is now a reality. Otto Bock Healthcare develops and produces so-called myoelectric prostheses. The Greek word Myos (meaning muscle) indicates how they work. Tensing a muscle produces a tiny electrical charge, which is conducted via electrodes to the prosthesis, where a motor converts it into the intended movement. Visitors to the Ars Electronica Center have the opportunity to try out such prostheses.

LEONDING MICROS

by Michael Rader, Martin Weber, Markus Kaltenbruner, Bernhard Öhlinger, Gerhard Gehrer, Gerhard Höfer, Josef Mundigler, Thomas Stütz, Harald Judtmann, Wolfgang Holzer, Manfred Mauerkirchner / Leonding Technical & Vocational School

The LEONDING MICROS fought their way to a 2nd, a 4th and a 5th place finish at Euroby 2008, the European robot football championship. And did so as the only non-university team in the competition! The Euroby was the framework for the first contact between Ars Electronica and the Leonding Technical & Vocational School, and it immediately generated a brainstorm: setting up a robot football team on a permanent basis at the new Ars Electronica Center. This collaboration is designed to give the students a chance to show what they can do to the general public and to experts in the field. What the crowd attending a match sees are robots, a camera and a computer processor. The robo-kickers (10-cm cubes) moving about independently on the pitch are registered by the camera. The processor interprets the image and devises the strategy appropriate for the respective situation. It's implemented in the form of commands to the individual robots, who then attempt to advance the ball into the opposing team's goal.

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IN DEEPSPACE

DEEP SPACE is a one-of-a-kind setting in which three-dimensional digital worlds and high-definition imagery can be experienced close-up. Its technical core consists of eight 1080p HD- and Active Stereo-capable Barco Galaxy NH12 projectors sending images to two jumbo-format 16x9-meter projection screens mounted on the wall and in the floor. The best view—and a refreshingly dizzying shift of perspective—is available from a viewing platform running along the wall at a height of about five meters.

LINZ – A SOMEWHAT DIFFERENT PERSPECTIVE

by Erich Pröll / Pröll Film Production GmbH © 2009

DEEP SPACE in the new Ars Electronica Center is showcasing Upper Austrian filmmaker Erich Pröll's lovingly-made presentation of very special places in Linz. This work opens up some surprising new perspectives for visitors and locals alike. Scampering, sniffing, swimming and flying through the city ... This film will make its TV debut on "Universe Linz – With the Eyes of Animals" to be broadcast in April 2009 on the Austrian Broadcasting Company's TV channel ORF2.

CYARK

cyark.org

The "On-Site" project series lets DEEP SPACE visitors do a virtual walk-through of the gigantic archive amassed by the non-profit organization CyArk. These are virtual reproductions of humankind's most important cultural treasures.

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Haltadefinizione utilizes extremely high resolution photographs as a method of preserving historical art masterpieces—for instance, "The Last Supper" by Leonardo da Vinci. 16,118,035,591 pixels make possible unequalled richness of detail that reveal da Vinci's artistic techniques, the decomposition of the materials, and minute elements in the imagery. In addition to "The Last Supper," visitors to DEEP SPACE can scrutinize impressive digital versions of Gaudenzio Ferrari's "Passion of Christ" and Andrea Pozzos trompe l'oeil ceiling in Sant'Ignazio Church.

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