fet^{11}

The European
Future Technologies
Conference and Exhibition

4-6 May 2011
Budapest, Hungary

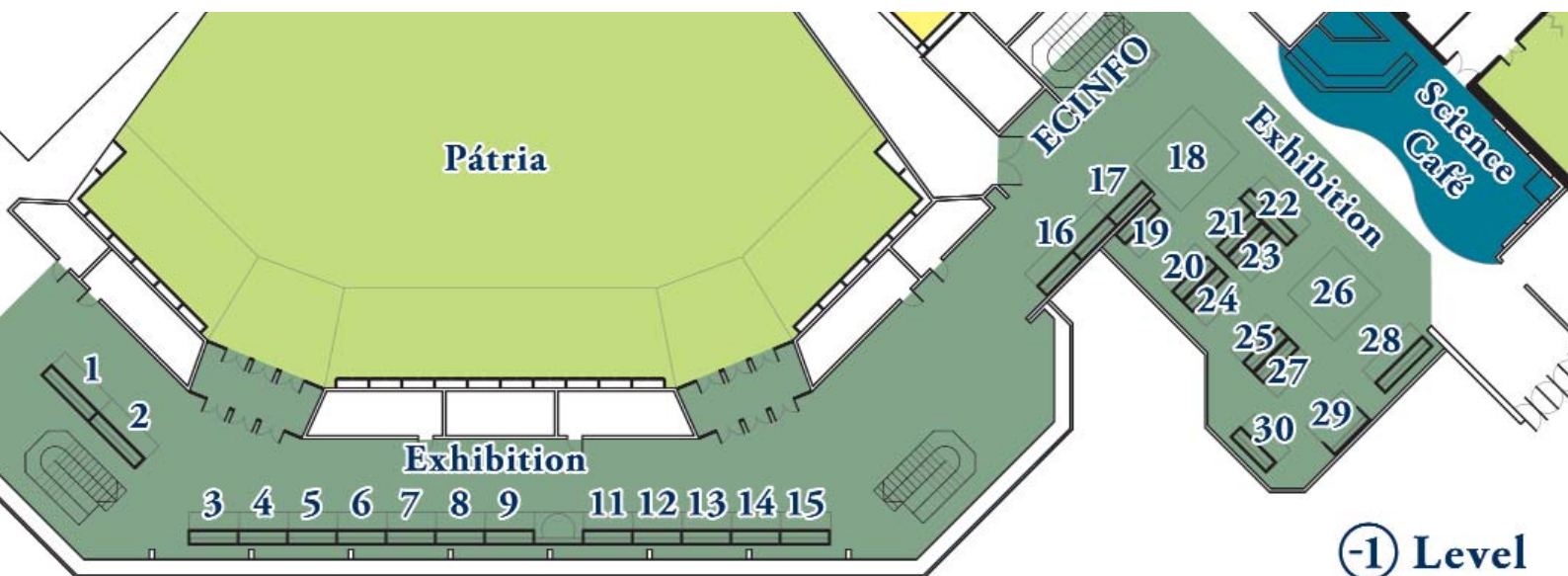# Science
beyond fiction

Exhibition

www.fet11.eu

European Commission
Information Society and Media

SEVENTH FRAMEWORK
PROGRAMME

ERCIM

MTA
SZTAKI

eu 2011.hu

Pátria

Exhibition

1 2 3 4 5 6 7 8 9 11 12 13 14 15

ECINFO

Exhibition

Science Café

16 17 18 19 20 21 22 23 24 25 26 27 28 29 30

(-1) Level

Stand 1: Brain-Computer Interaction

Stand 2: The future of biomimetic machines

Stand 3: Non visual floor augmentations

Stand 4: Restoring vestibular functions using an implantable neuroprosthesis

Stand 5: OCTOPUS - Novel Design Principles and Technologies for a New Generation of High Dexterity Soft-bodied Robots Inspired by the Morphology and Behaviour of the Octopus

Stand 6: CyberRat: High Resolution Bi-directional Brain-Chip Interface

Stand 7: Single Photon Imaging: from Dream to Reality

Stand 8: Pd-net - Towards Future Pervasive Display Networks

Stand 9: ANGELS Reconfigurable eel like robot with electric sense

Stand 11: Swimming bio-inspired artefacts with 3D vision

Stand 12: Synthetic Pathways to Bio-inspired Information Processing

Stand 13: Acroban the Humanoid: Playful and Compliant Physical Human-Robot Interaction

Stand 14: Brain-Inspired Computing - Theory, Technology and Education

Stand 15: A new kind of robot: ECCEROBOT

Stand 16: Future technologies to support collaborative solutions for grand challenges (Biological water safety, Augmented collaboration, e-Infrastructures for science)

Stand 17: Energy harvesting for powering wireless ICT devices

Stand 18: Swarmanoid

Stand 19: Exploring the Quantum world: from Games to Diamond Qubits and Secure Quantum Communication

Stand 20: Frontiers of Nanoscale, Opto- and Electro-Mechanical Technologies

Stand 21: Graphene based nanoelectronic devices

Stand 22: BIOmimetic Technology for vibrissal ACtive Touch (BIOTACT)

Stand 23: Living Knowledge diversity-aware technologies

Stand 24: The Eye, the Doctor and the Engineer

Stand 25: Browsing the digital traces of science

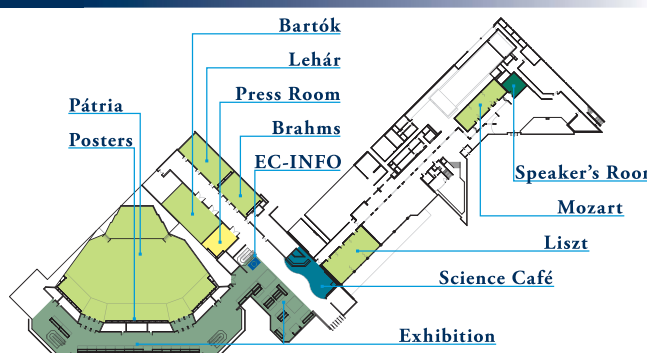**Stand 26:** Diving into the Internet

Stand 27: Adaptive Networked Societies of Tiny Artefacts

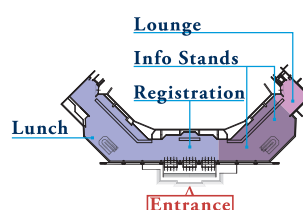**Stand 28:** Pervasive Adaptation: it's here!

Stand 29: Interview corner

Stand 30: Starlab, a high-tech SME in FET

-1 Level

Bartók
Lehár
Press Room
Brahms
EC-INFO
Pátria
Posters
Speaker's Room
Mozart
Liszt
Science Café
Exhibition
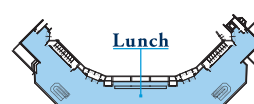
0 Level

Lounge
Info Stands
Registration
Lunch
Entrance

Info Stands

1 – Ideal-IST - Your Worldwide ICT support network
2 – e-ScienceTalk - Talking about e-Science
3 – CHIST-ERA : European Coordinated Research on Long term Challenges in ICST
4 – FRONTS Experiment - People Tracking
5 – ERCIM / W3C

1 Level

Lunch

Exhibits at *fet*[11]

Brain-Computer Interaction
Think it and it's done

Why not try out a brain computer interface for yourself? Four prototype applications are on show – you can write text using a mentally operated virtual keyboard, select pictures from a collection simply by focusing your attention on the desired picture, send a mental command to a functional electrical stimulation (FES) system that can deliver currents to forearm nerves to regain control of your hand for grasping, and control a small mobile robot designed for telepresence.

Stand 1 • contact: Jose del R. Millan • cnbi.epfl.ch

The future of biomimetic machines

This exhibit will feature a number of demonstrations showcasing the potential of biomimetic systems to transform the way ICT technologies are developed and deployed in society. On show: the world's first integrated neuroprosthetic device that in tests has successfully replaced a lesioned circuit in a rodent's brain; a biomimentic chemical sensing robot; a wearable device that allows exploration of complex brain data (EEG, ECG, gesture, movement, including eyes, etc.) and a live stream from an ongoing cognitive neuromorphic engineering workshop.

Stand 2 • contact: Anna Mura • csnetwork.eu

Non visual floor augmentations
ICT goes walkabout: interfacing your shoes with the floor

Slip on a pair of sandals, pop a knapsack on your back and experience the sensation of walking over creaking floorboards, mud or even snow without leaving the exhibition. Your shoes detect foot action through force sensors and exchange data with a mobile microphone-based sensing floor. The sensations underfoot increase as the wearer approaches a wall of the exhibit so his or her reaction can be observed as the snow or mud gets deeper.

Stand 3 • contact: Federico Fontana • www.niwproject.eu

Restoring vestibular function via an implantable neuroprosthesis

See how implantable neuroprosthetics can restore function for people with vestibular disorders. Vistors can see inertial sensors connected to a laptop showing the real-time movement of a mechanical system simulating the head of a subject, as well as implantable electrodes which are used during in-vivo experiments.

Stand 4 • contact: Silvestro Micera • www.clons-project.eu

OCTOPUS - Novel Design Principles and Technologies for a New Generation of High Dexterity Soft-bodied Robots Inspired by the Morphology and Behaviour of the Octopus

Welcome to the aquarium where you can try your hand at operating a robotic octopus, and at the same time gain a greater understanding of the principles of embodied intelligence which when applied to biomimetic soft-robotics technologies make possible the highly dexterous motor capabilities of this robotic octopus.

Stand 5 • contact: Cecilia Laschi • www.octopus-project.eu

CyberRat: a high resolution bi-directional brain-chip interface

Watch videos of brain-chip recording sessions made as part of the CyberRat project. CyberRat has developed an innovative interface between a semiconductor chip or an ensemble of chips and the brain of a living rat. Small CMOS chips featuring stimulation and recording sites integrated at high-density are implanted in several brain areas obtaining an unprecedented control of neuronal activity in the rat's brain.

Stand 6 • contact: Stefano Vassanelli • www.cyberrat.eu

Single photon imaging: from dream to reality

The MEGAFRAME project has designed a camera whose pixels can detect a single photon a million times per second. Take a look at recent prototypes of the system and interact with the single photon camera. You will also be able to see images obtained with various generations of single photon detectors, illustrating the development chain over the years.

Stand 7 • contact: Claudio Bruschini • www.spadnet.eu

Pd-net - Towards future pervasive display networks

Visitors can get to grips with different aspects of future pervasive display networks with this hands-on experience. The exhibit combines a number of interactive applications running on an initial version of the PD-NET middleware and acts as a starting point for understanding the underlying concept of pervasive display networks.

Stand 8 • contact: Nigel Davies • pd-net.org/

Reconfigurable eel-like robot with electric sense

A robot which swims like an eel is the main attraction at the ANGELS stand. The prototype is made up of nine modules with propellers which can be operated independently or joined together. The robot is equipped with an electrolocation sensor which enables it to avoid obstacles and walls, and to distinguish the basic shape of objects.

Stand 9 • contact: Alexis Girin • www.theangelsproject.eu

Swimming bio-inspired artefacts with 3D vision

Watch bio-inspired artefacts swimming in a small pool. The artefacts will move in a real adaptive way as a sort of natural "resonant" system, in which mechanical properties of skeletal apparatus and actuators stabilize the system during locomotion. Experimental sessions will be interleaved with presentations describing project relevance and its impact on technology.

Stand 11 • contact: Stefano Orofino • www.lampetra.org

Synthetic Pathways to Bio-inspired Information Processing
Towards the synthetic brain (of a pond snail)

Find out how organic memristor was used to fabricate a functional material structure capable of mimicking the associative learning of feeding behaviour in the pond snail. Watch films showing the experimental data on the signal propagation kinetics in basic memristors and their networks, or showing the insurgence of "hebbian" patterns during the training of a complex phase-separated molecular memristor-functionalized gold nanoparticles composite network. Visitors will be shown a preliminary prototype of this adaptive complex network.

Stand 12 • contact: Viktor Erokhin • www.fp7-bion.eu

Acroban the humanoid: playful and compliant human-robot interaction

Meet Acroban, the first humanoid robot that can move around, walk and play with children without losing its balance. Acroban exhibits a range of behaviours that it can combine, and can react intuitively, naturally and creatively to uncontrolled external human intervention. Visitors will be able to see Acroban in action and interact with him.

Stand 13 • contact: Olivier Ly • flowers.inria.fr

Brain-inspired computing - theory, technology and education

Come and see a brain-inspired or neuromorphic computer in action. Visitors will be able to choose from many different network architectures including biologically inspired cortical structures as well as generic concepts like "liquid computing". Staff will be on hand to modify network parameters interactively in order to demonstrate typical workflows for using these new architectures..

Stand 14 • contact: Björn Kindler • BrainScaleS.eu

A new kind of robot
Shed your skin – introducing ECCEROBOT

Shake hands with ECCEROBOT, a radically new kind of robot with a spectacular appearance. ECCEROBOT looks like a life-size human with the skin peeled off so that the bones, muscles, and tendons can be seen in motion. The stereotype of the robot is usually either dangerous or fragile. This exhibit attempts to move beyond this mindset, and this mindset must be overcome.

Stand 15 • contact: Owen Holland • eccerobot.org

Future technologies to support collaborative solutions for grand challenges (Biological water safety, Augmented collaboration, e-Infrastructures for science)

Fluorescence Digital Holographic Microscope for Biological Water safety Inspection System

Cleaner drinker water – thanks to a fluorescence digital holographic microscope

3D Virtual Collaboration Arena

VirCA is a loosely coupled modular, 3D Internet based interactive virtual environment for collaborative manipulation of robots and other hardware or software equipment.

21st Century Fuel for Research and Development

The dream of instant information at our fingertips is becoming a reality thanks to the broadband internet access, and only one step behind follows the promise of harnessing almost unlimited computational power through the interconnected mass of computers and devices now online.

Stand 16 • contact: Szabolcs Tökés • www.sztaki.hu

Energy harvesting for powering wireless ICT devices

Shaking, rattling and rolling: Alternative energy sources for wireless ICT devices.
Come and see how the vibrations from a car's engine, passenger compartment and shock absorbers can be harvested into electricity. Watch an animation which describes the science behind the "non-linear bistable energy harvester" that converts shaking, rattling and rolling into energy, and estimates how much energy can be produced. Or download an iPhone app which shows how much energy that you could generate just by giving your phone a shake.

Stand 17 • contact: Luca Gammaitoni • www.wisepower.it

Swarmanoid
Climbing, flying and getting the job done: Meet a new generation of swarmanoids

See robots fly, climb and wheel themselves around as they get on with their work. Or even set them an individual or collective task by writing a simple program. The exhibit aims to show how biologically inspired principles of swarm intelligence can be applied to robotics.

Stand 18 • contact: Marco Dorigo • www.swarmanoid.org

Exploring the quantum world of games, diamonds and secure communications

Roll up, roll up for a game of "quantum roulette". A quantum random number generator will be used to draw winning numbers in a roulette game where visitors can play to win small prizes. The game exploits the unique lattice properties of diamond which allows quantum devices to run in ambient conditions. This exhibit will demonstrate a number of other applications which explore the quantum world, and its promise of better performance at smaller scale with less power consumption.

Stand 19 • contact: Kamna Pruvost • qurope.eu/quie2t

Frontiers of nanoscale, opto- and electro-mechanical technologies
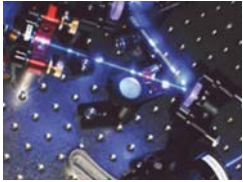
The aim of this exhibit is to promote understanding of the quantum phenomena of micro and nano-mechanical devices that can be harnessed for ICT and QIPC and for ultra-high sensitivity sensors. Visitors to the stand will get a hands-on experience of nanoscale, opto- and electro-mechanical devices at work and have the opportunity to discuss with top scientists in the field who will show-case key research outputs and link them to wider strategies.

Stand 20 • contact: Markus Aspelmeyer • www.minos-fp7.eu

Graphene based nanoelectronic devices
Getting to grips with graphene

Why not get to grips with graphene - the new shooting star of ICT. Visitors can touch and examine prototypes of transparent wafers coated by graphene and test its electrical conductivity. They can also test the protective nature of graphene by putting copper foils coated by a graphene layer on a hot-plate and observing the result.

Stand 21 • contact: Daniel Neumaier • www.grand-project.eu

BIOmimetic Technology for vibrissal ACtive Touch
Shrewbot is the cat's whiskers

Meet ShrewBot and his friends, a group of robots inspired by the sensory systems of animals with whiskers. Robots equipped with vibrissal sensors are designed to operate in places in which more conventional sensors fail, like smoke or dust-filled environments or in murky water. Visitors can also watch videos of animals using their whiskers to explore their environments.

Stand 22 • contact: Tony Prescott • www.biotact.org

Living knowledge diversity-aware technologies

Looking for a search engine to find images or web pages about David Beckham arranged in terms of the various clubs he has played for? This 15 minute demonstration of LivingKnowledge showcases technologies enabling bias-aware, diversity-aware and evolution-aware information access, including diversity-aware search within texts and images, analysis of future predictions as well as fact-and-opinion extraction.

Stand 23 • contact: Vincenzo Maltese • livingknowledge-project.eu

The Eye, the Doctor and the Engineer

Come and see what the Hungarian Bionic Vision Centre is doing to help and assist the visually impaired with technical inventions, such as retinal implants and special mobile devices. Our demonstration deeply relies on medical and engineering research when combining emerging technologies to revolutionize the tools for visually impaired people. Visitors will see retinal implants and short videos of patients with retinal implants. Visitors can try out some of these devices for themselves including the implementation of a bank-note recognition software program using a smart-phone.

Stand 24 • contact: Akos Kusnyerik • english.sote.hu • www.hbvc.hu

Browsing the digital traces of science

How is science evolving? Can we automatically reconstruct the history of a research field ? In this exhibition, people will dive into the phylogeny of science reconstructed from the analysis of decades of scientific literature. Participants will be able to select a particular FET topic and visualize its developments through time in terms of keywords, related papers, illustrations and scholars. In absence of interactions, the phylogeny explorer device will permanently unfold the digital traces of science, suggesting paths through the ever-fluctuating landscapes of science.

Stand 25 • contact: David Chavalarias • tinasoft.eu • sciencemapping.com

Diving into the Internet
Enter the Observatorium and get inside the web

This exhibit experiments on networks built from real-time Internet data, giving participants the feeling they are really "inside" the web and witnessing what is happening right now. The objective is to better understand the processes of knowledge generation and opinion dynamics. Visitors will be invited to enter a dark room where they can interact with a network of news extracted from the on-line press.

Stand 26 • contact: Jorge Louçã • theobservatorium.com

Adaptive networked societies of tiny artefacts

Discover for yourself the functionalities of an adaptive networked society of tiny artefacts! The networked society comprises 40 wireless sensor nodes and 3 mobile robots which together form a distributed self-organizing society. Visitors will be able to interact with this society using wireless controllers, a smart phone or a tablet PC.

Stand 27 • contact: Ioannis Chatzigiannakis • http://fronts.cti.gr/fet2011

Pervasive Adaptation: it's here!
Learning about pervasive adaptation through art and music

Fancy yourself as the next Jackson Pollock? Want to find out how music - from Mozart to Meatloaf - can affect your mood? These are just two of the interactive games, videos and interactive displays on show to demonstrate concepts embodied in pervasive adaptation, which refers to the ability of information and communication systems to adapt autonomously to dynamic user contexts. Artificial multi-robot organisms consisting of a swarm of robots, which can dock with each other and share energy and computational resources within a single artificial-life-form, will be demonstrated.

Stand 28 • contact: Jennifer Willies • www.perada.eu

Starlab, a high-tech SME in FET

Try out Starlab's Enobio Brain Computer Interface for yourself at this exhibit which sets out results and information from research projects on non-invasive brain stimulation and human computer confluence. Visitors can try on the wireless BCI system and test some basic BCI software. More complex demonstrations will also take place with exhibit staff wearing the system.

Stand 30 • contact: Stephen Dunne • starlab.es

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