FUTURE AND EMERGING TECHNOLOGIES

FACTS & FIGURES

European Research in Action

Future and Emerging Technologies (FET) promote **long-term** & **high risk** research that aims to advance scientific and technological knowledge in Information and Communication Technologies (ICT). FET projects target research breakthroughs that have the potential to radically transform our scientific and technological basis for tomorrow's society.

FET research has contributed to Europe's leadership in areas like **quantum computing and communications, nanoelectronics, neuro- and bio- information science, advanced robotics and complex systems**.

FET attracts many **top scientists** whose outstanding work throughout their careers has earned them international recognition. For example, partners in several FET-funded European research projects have received top rewards such as the *Nobel Prize in Physics* awarded to **Albert Fert (FR)** and **Peter Grünberg (DE)** in 2007 and to **Theodor Hänsch (DE)** in 2005. In 2008, the *Marie Curie Prize* was awarded for research on the effects of low and very low doses of ionizing radiation on human health and biotopes to **Andrea Ferrari** (project VIACARBON) and the *Isaac Newton Medal of the Institute of Physics* to **Anton Zeilinger** for his contributions to the foundations of quantum physics (project QAP).

Some **150 projects** are currently funded by the FET research, launched in **1989**, and now celebrating its 20th birthday.

Funding

FET is part of the ICT activities funded by the EU Framework Programme for Research (FP). Over the years, investment has risen in a continuous effort to support FET research.

Breakdown figures for EU funded FET projects since 1994

(FP4) 1994-1998 – total funding of **€281 million**
(FP5) 1999-2002 – total funding of **€293 million**
(FP6) 2003-2006 - total funding of **€325 million**

Funding for 2007-2013

The current FP - the Seventh Framework Programme (FP7) - has a total budget of **€9 billion** for ICT over 2007-2013. In 2008, around **8%** of the yearly expenditure was invested in FET research and it will rise to **10%** by 2013.

Today's commitment by the European Commission to increase funding for FET research will make available around €800 million from FP7, as follows:

- **ca. €90 million/ year from 2007 to 2008**
- **ca. €100 million/ year from 2009 to 2010**
- progressive increase to reach **€170 million/ year by 2013** (i.e. almost doubling 2007's budget)

Global Partners for Global Ambitions

In the context of the globalization of research, Europe's research offers a system open to virtually any country in the world. All projects include partners from at least three different European or associated countries.

Not only is FET open to all European Members States, but it also attracts organisations from Canada, China, India, Japan, Russia and the US, among others.

Natural Interactive Walking: Feeling your way… with your feet

Exhibition **STAND B5**

Try it at "Science beyond Fiction": Put on the shoes endowed with force sensors and small loudspeakers and without leaving the fair, take a walk in the snow or kick around a virtual ball!

WHAT?

As we walk along concrete city sidewalks, over gravel, or across tiled building lobbies, we are continuously exposed through our footsteps to highly structured information about the ground, through the feelings we experience and the sounds we hear.

The Natural Interactive Walking project is trying to reinforce our understanding of how our feet interact with surfaces on which we walk. It is investigating the sensations we have when walking which help us to interpret space in an intuitive way and build realistic virtual settings.

Through ICT-enhanced floors and footwear capable of replicating everyday ground attributes, the project is attempting to achieve a real sense of "being there". To do so, it creates an illusion in the way users perceive their surroundings, using data coming from haptic (touch) and auditory (sound) channels.

WHY?

This research may lead to radically new approaches to interaction, for example in airports, railway stations as well as in public urban spaces. It could be applied for example to navigation aids such as land-marking, guidance to locations of interest, signalling, and warning about obstacles and restricted areas. Such research may also open the door for better assistive tools for visually-impaired and other special-need users.

WHO?

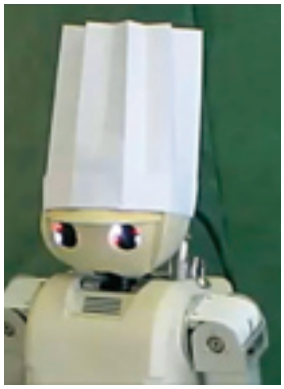
The Natural Interactive Walking project includes the following research centres:

- UNIVR (Italy) - Dipartimento di Informatica of the Università di Verona - Vision, Image Processing, and Sound laboratory
- McGill University (Canada) - Centre for Intelligent Machines – Shared Reality and Intelligent Environments Lab
- AAU (Denmark) - Institute of Media technology and Engineering Studies (IMI) at Aalborg University
- INRIA (France) - French National Institute for Research in Computer Science and Control
- UPMC (France) - Université Pierre et Marie Curie - Paris 6 – Institut des Systèmes Intelligents et de Robotique (ISIR)

More information: http://www.niwproject.eu

“I Robot, your companion”

Exhibition **STAND C3**



See it at “Science beyond Fiction”: Demonstration of a fully equipped autonomous robot that is able to perform “fetch and carry” tasks for you.

WHAT?

Can robots interact with humans, learn lessons from them and adapt their behaviour accordingly? This is what the scientists working for the COGNIRON (Cognitive Robot Companion) project wanted to achieve.

COGNIRON aimed to endow robots with cognitive capacities so they can interact with humans and perceive, decide, communicate and learn.

The starting point for the project was to define a large number of competences that such robots might need to serve humans effectively. These competencies were then tested in “three key experiments”: the Robot Home Tour, the Curious Robot and Learning Skills and Tasks.

The Robot Home Tour demonstrated how a robot might learn about the structure, appearance and semantics of a “human home environment”. The Curious Robot demonstrated how a robot might cooperate with a human being to perform “fetch and carry” tasks. Learning Skills and Tasks focussed on how robots can arrange and interact with objects. An impressive and entertaining result of this experiment was the Chief Cook Robot which can learn the cooking tasks it is taught.

WHY?

Intelligent robots could become our future companions. Among application possibilities of such technology, we may imagine robots adapted to SME production needs, or robots able to help persons with disabilities in their daily life and in the longer term, smart robots for everyone’s use.

WHO?

COGNIRON includes partners from the following research centres:

- LAAS-CNRS (France) - Laboratoire d’Analyse et d’Architecture des Systèmes
- EPFL (Switzerland) - Swiss Federal Institute of Technology, Autonomous Systems Lab
- IPA (Germany) - Fraunhofer Institute for Manufacturing Engineering and Automation
- KTH (Sweden) - Royal Institute of Technology, Centre for Autonomous Systems
- UVA (Netherlands) - University of Amsterdam, Intelligent Autonomous Systems Group
- UniBi (Germany) - University of Bielefeld, Applied Computer Science Group
- UH (UK) - University of Hertfordshire, Adaptive Systems Research Group
- UniKarl (Germany) - University of Karlsruhe, Inst. Ind. Application of Informatics and Microsystems
- ETH Zurich (Switzerland) - Eidgenössische Technische Hochschule Zurich

More information: http://www.cogniron.org

3D TV

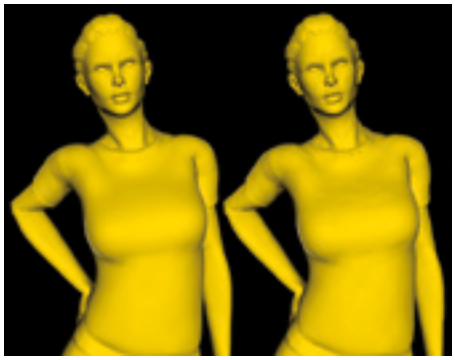
Exhibition **STAND G5**

See it at "Science beyond Fiction": Interact with the latest 3D technology, which shows the way forward for holographic TV.

WHAT?

3D holograms are understood to be the ultimate 3D display technology. This technology offers perception of 3D scenes without need of glasses or other tools and respects viewer's position. Is 3D TV about to come of age?

Creating a digital hologram poses a real challenge for today's computers. This project is attempting to find a solution for making holographic displays viable. One way experienced by the project to go beyond state-of-the-art in 3D is to combine fast computer graphics algorithms, processors, distributed computing techniques and novel optical and holographic printing techniques.



WHY?

The project is exploring several issues, like imaging and computer graphics, signal processing, telecommunications, electronics, optics and physics principles, to find out possibilities to create, transmit and display 3D object in a way that human will not be only perceiving 3D images, but also be able to interact with them. This may open the door to new viewer experiences and new interactive TV services in the future.

WHO?

This project is coordinated by the University of West Bohemia, Czech Republic

More information: http://holo.zcu.cz