

Editorial



This is the **first issue** of the **IST Future and Emerging Technologies Newsletter**.

FET is the part of the IST programme dealing with transnational collaborative basic research.

FET's mission is to nurture many 'novel ideas'

for core technologies and radically new uses, up to their blooming into the first proof of concept, narrowing down options that would lead to the industrial solutions of tomorrow.

Our newsletter will inform you about our success stories, main achievements and

the key results from our projects and initiatives.

A warm welcome to all of you and enjoy the reading.

Thierry Van der Pyl,
Head of Unit of FET

DIRECTORATE GENERAL
INFORMATION SOCIETY AND MEDIA
FUTURE AND EMERGING TECHNOLOGIES

FET through the keyhole

Newsletter

Viviane Reding experiences 'Presence' at CeBIT

On March 10th 2005 Commissioner Viviane Reding and our Director Ulf Dahlsten visited the FET Presence booth at CeBIT's 'Future Park' in Hannover. There, they had the opportunity to 'experience Presence' through a variety of set-ups, including full surround audio/visual immersion, haptic interfaces to virtual worlds, an EEG-based brain interface, as well as walk-through, virtually populated historical maquettes and emotionally responsive environments.

The FET Presence Initiative was launched in 2002 under FP5 and its follow-up on 'Presence and Interaction in Mixed Reality Environments' is under the current FET FP6 Call 4.

The Presence booth at CeBIT illustrated results

from 9 projects: ADAPT, PRESENCIA, MEC, OMNIPRES, BENOGO, TOUCHHAPSYS, EMMA, LIFEPLUS and HAPTEX (<http://www.cordis.lu/ist/fet/pr.htm>).

The FET Presence booth was surely the most interesting one in the whole Future Park. 'It made a real difference to have impressive hands-on demonstrations, rather than

just folders and slide presentations' said Ulf Dahlsten, and he added: 'It illustrates perfectly the role of FET: *to turn dreams into reality*'.

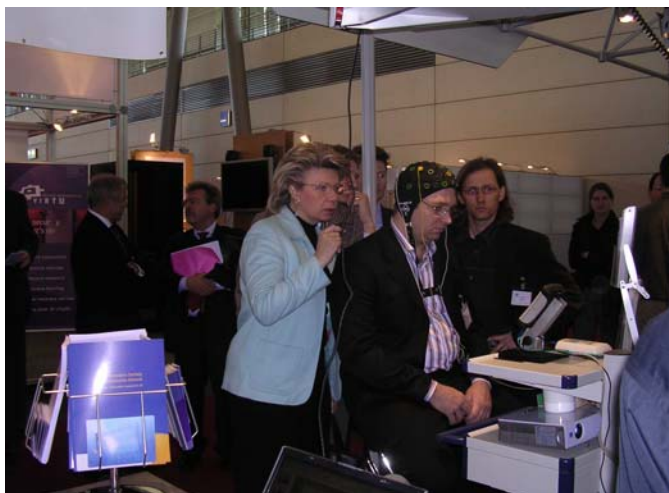
Nadia Magnenat-Thalmann, coordinator of HAPTEX and LifePlus afterwards commented that 'The overall feedback was very positive and we strongly encourage to repeat this kind of event,



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crews filming the demos and various

involving even more funded projects, in order to raise public awareness of EU funding programs for FET'.

The presence at CeBIT 'was clearly useful to show our work to an audience that otherwise would not have been reached' said Matteo Brunettini from ADAPT. It also generated a wide press visibility with a dozen TV-

magazines taking interviews.

As a result Christoph Guger demonstrated the PRESENCIA brain-computer interface live in a major TV show. Which project deliverable is being seen by millions of people?

In her closing remarks, after having experienced Presence 'hands- and head-on', Ms. Reding encouraged the researchers to use their results for innovating media technologies. CeBIT was an excellent platform to kick this off.

The Disappearing Computer in Communications of the ACM

It seems like a paradox but it will soon become reality: the rate at which computers disappear will be matched by the rate at which information technology will increasingly permeate our environment and determine our lives. The increasing ubiquity of computers and related devices (e.g., sensors) and their diffusion into our environment requires a rethinking of the complex interplay between technology and humans. The often quoted observation by Mark Weiser, that 'The most profound technologies are those that disappear. They weave themselves into the fabric of everyday life until they are indistinguishable from it.' set the

course for ubiquitous computing and the stage for the vision of an unobtrusive, calm technology.

Since then, the effort to make technologies disappear into the background has been an ongoing endeavour involving a series of international initiatives and innovative programmes. One prominent example is the proactive initiative "The Disappearing Computer" (DC) launched and funded



under the 'Future and Emerging Technologies' strand of the IST programme.

The March 2005 edition of 'Communications of the ACM' devoted a special issue exploring the progress on "The Disappearing Computer". Guest editors Norbert Streitz and Paddy Nixon (chair and vice-chair of the DC Initiative) have orchestrated authors and projects from Europe and the US to present a variety of perspectives, reflections, and visions for building these technologies and services.

(<http://www.disappearing-computer.net>)

FET-QuComm project received the 2004 Descartes Prize

Eight finalists were in the running for the 2004 Descartes Prize. This European award goes to transnational teams rather than individual researchers and their work is judged on the criteria of excellence and co-operation, and the necessary balance between the two.

The Qu-Comm project, one of the two winners, was coordinated by Professor Anders Karlsson of the KTH in Stockholm and



brought together laboratories from Austria, Germany, France, Sweden, the United Kingdom and Switzerland, as well as Los Alamos National Laboratory in the USA.

The project has made revolutionary breakthroughs in the field of quantum communication and a crucial advance towards secure global communication networks. It demonstrated how a secret key can be distributed between two persons using photons sent on an optical fibre at long distance

or in free space—something very important in the area of security. In

This prize is essential because it is part of the process of the Europeanisation of research by encouraging scientists to co-operate more and more effectively' said Janez Potočnik, Commissioner for Science and Research at the opening ceremony in Prague (2/12/04)

this case the transmission of codes is protected by the laws of quantum physics and therefore eavesdropping is not possible.

(<http://www.imit.kth.se/QEO/qucomm/>)

First European Conference on Complex Systems

Leading world experts gathered at the 1st European Conference on Complex Systems in Turin Italy last December to present their latest research results in this relatively new multidisciplinary domain. 'There is nothing new about complex systems' says Dr John Casti, project manager of the EXYSTENCE Network of excellence funded by FET. 'They have been with us from the time

our ancestors crawled up out of the sea. But what is new is that for perhaps the first time in history, we have the knowledge and the tools to study such systems in a controlled, repeatable, scientific fashion. So, there is reason to believe that this new found capability will eventually lead to a viable theory of such systems'.

Complexity science covers the scientific, mathematical and engineering study of complex systems that consist of many simple interacting components exhibit complex overall behaviour.

Next relevant call under FET Call 5: 'Simulating Emergent Properties in Complex Systems' (Info day June 2nd 2005).

(<http://www.cordis.lu/ist/fet/ie-june05.htm>)

FET-PACE project and 'Protolife'

The FP6 project PACE explores the use of protocells, or artificial cells, in order to create complex and evolvable information systems.

A PACE partner, Protolife, founded in 2003 (Venice) is a start-up. Dr Packard, Chairman and CEO of Protolife Srl describes: 'programming artificial cells created from non-living matter have



useful chemical functions in a variety of possible application areas'.

'Artificial cells can be thought of as tiny machines that can be programmed to clean out arteries, deliver drugs to specific sites in the body and

perform other jobs with great precision. The range of useful chemical functions ultimately envisioned is

vast'.

Protolife's role in PACE is partly to do simulations of chemical and lipid sub-systems (components of protocells) and also to build up a laboratory where programming of chemical reactions and self-assembly processes is done to guide the protocells to be functional and do useful things.

(<http://134.147.93.66/bmcmyp/Data/PACE/Public>)

FET-EQCSPOT project: Award winning Swiss start-up 'id Quantique'

Using randomly generated numbers to ensure the security of encryption applications seems counter-intuitive but it is a fundamental part of quantum cryptography. id Quantique is an award-winning Swiss start-up, founded in October 2001, that pioneers this approach and launched the world's first commercial quantum random number generator and quantum cryptography system as a result of the groundbreaking work done in EQCSPOT FET funded project.

It is a spin-off from the Applied Phys-

ics Department of the University of Geneva. December 2003 marked a milestone in the company's evolution: the entrepreneurs successfully raised 1 million euros from the Luxemburg-based i2i venture capital fund in a first round of funding and they concluded a worldwide exclusivity agreement with the University of Geneva regarding two important quantum cryptography patents.

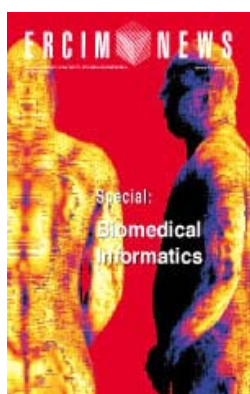
Over a short period of time, the fledgling company and its founders

have won several prestigious prizes. The company was a recipient of the European Innovation Awards from the Wall Street Journal Europe (2001); O. Guinnard and G. Ribordy were winners of the de Vigier's prize for Swiss entrepreneurs in 2002; and in 2004 the company was a winner of the annual Swiss Technology Award and has also received the Philip Morris prize.

(<http://www.idquantique.com/>)

ERCIM News: IST-FET/NSF Strategic Workshop report

ERCIM has just published a report on the 'Engineering Software-Intensive Systems' workshop as part of the strategic workshop series under the auspices of the European



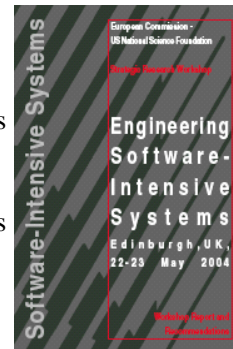
Union (IST-FET) and the US National Science Foundation, 'Computer and Information Sciences and Engineering' division.

This strategic research workshop was organised in Edinburgh, Scotland, 23-24 May 2004, with the objective to present and discuss future R&D directions, challenges, and visions in the emerging area of software-intensive systems. About 20 leading experts from Europe, the United

States and Australia participated in the workshop and identified research issues and challenges.

More information on this workshop, its main findings and the list of participants can be found at:

(<http://www.ercim.org/EU-NSF/sis.pdf>)



Impact Assessment of the IST-FET Open Scheme

Dating back as far as 1989, with the advent of FP2, came the consensus that supporting basic research in ICTs is a solid investment, the payback of which, even if it does not come in the form of short-term industrial applications, is and will be significant. In FP3 and FP4, the follow-up actions on basic technology research aimed to lay the foundations for the “next wave” of ICT technologies that would underpin the future developments of European R&D.

In addition to research, these actions also focused on community building and on developing knowledge, skills and infrastructure and were designed to be open both in terms of research agendas and communities addressed. Many of the activities launched under

these actions, known today as the FET-OPEN scheme have since passed into the “mainstream” RTD under the subsequent framework programmes.

Recently, FET has undertaken a broad exercise to assess the scientific and technological impact of the FET-OPEN scheme. This impact assessment, done by members of the FET staff, is mainly based on the achievements of projects funded in the period 1994-2004 (i.e., FP4, FP5 and FP6 projects). According to the report findings, the FET-OPEN scheme proved to be particularly successful in opening new S&T possibilities, setting the agenda for future ICT research programmes, providing/exploring alternative technology solutions for industry, and confirming the

path-finding role that FET has in IST.

It is the ambition of the FET team to continue the FET-OPEN scheme in the coming FP7, thus retaining the core values which have characterised its success to date and continuing to support visionary, high-risk, high-return and long-term multidisciplinary collaborative research. The full



report can be downloaded from:

<http://www.cordis.lu/ist/fet/press.htm>.

This report will also be part of the coming ERCiM Newsletter.

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

QIPC Publications Coming-up

The aim of the ‘QIPC in Europe’ publication is the wide dissemination and promotion of Quantum Information Processing and Communication (QIPC) research in Europe.

The publication will contain 28 short articles written by 58 of the most prominent experts in Europe. The articles will give a balanced coverage of all areas of QIPC research: quantum communication, quantum computation, quantum information theory and applications. The goal is also to give a balanced geographical coverage and to present the activities of most research groups in Europe.

All articles stress upon the results obtained within the context of EC or na-

tionally funded projects. The goal of each article is to explain in an accessible way the basic concepts of a particular sub-area of QIPC and then to give examples and possible applications.

This collection of articles will give a good overview of QIPC research in Europe: main topics, main achievements, main challenges, main research groups, projects, collaborations, etc. at a level appropriate for non-specialists. The publication will contribute to *build a European identity and will express a unified image of the QIPC research in Europe* to the wider public and to decision makers.

A team of scientists in cooperation

with FET are in the process of writing another text, the European QIPC strategic report, a roadmap-type document. Its objective is to give a detailed assessment and outlook of QIPC research in Europe and express the visions and challenges in a structured way within a more technical approach. The publication "QIPC in Europe" and the strategic report complement each other in a meaningful way and are an important input for the preparation of FP7.

The current version of the strategic report is now available in the FET QIPC web site:

<http://www.cordis.lu/ist/fet/qipc.htm>

New Coordinated Action: Beyond the Horizon

Beyond the Horizon (B-T-H) is a new coordinated action supported by FET with the purpose of providing input about ICT-related emerging topics and strategic research areas. These will then be further elaborated through a

well-organised, extensive and systematic consultation of the relevant research communities throughout Europe, involving the main actors and experts in the related fields. Output from B-T-H will help FET in identi-

fying new research programmes under the forthcoming FP7.

For further details on B-T-H, its objectives and thematic groups, please see: <http://www.beyond-the-horizon.net/>

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<http://www.cordis.lu/ist/fet/home.html>

COMMENTS and CONTRIBUTIONS

For any comments or contributions

for future issues of this newsletter

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(Subject: FET-Newsletter)