



Editorial

On September 21st 2005 the European Commission approved its proposals for a Council decision concerning the Specific Programmes implementing the **Seventh Framework Programme (2007-2013)** of the European Community for research, technological development and demonstration activities.

The new research Framework Programme (FP7) is organised into four main objectives through specific programmes on Cooperation, Ideas, People, and Capacities.

FP7 site: <http://www.cordis.lu/fp7/>

This issue of the FET Newsletter features the status of preparations of FET for the future and, in particular, FET's position in FP7.

It also highlights some of the latest success stories, achievements from our ongoing projects and initiatives and provides an update on our latest call for proposals and related issues.

A warm welcome back after the summer and we hope you will enjoy the reading.

Thierry Van der Pyl,
Head of Unit, FET

FET's Working Paper on FP7

FET has recently published a working paper presenting its strategic positioning in the coming FP7. In FP7, FET will aim to attract and foster trans-disciplinary collaborative research excellence in emerging research domains in core ICTs and in their combination with other relevant areas and disciplines. The ambition will be to revisit the

fundamental models of information, computing and communication in order to address *an emerging post-Turing and post-Shannon ICT era*.

More info, reactions, comments:
<http://www.cordis.lu/ist/fet/home.html>

BEYOND-THE-HORIZON Workshops on FP7

For preparing new research initiatives in FP7, a first series of thematic workshops are now being organised by the BEYOND-THE-HORIZON FET Coordination Action led by ERCiM



(contact point: jessica.michel@ercim.org).

Five such workshops have already taken place in the thematic areas of *Intelligent and Cognitive Systems* (11-12 June, Zürich), *Bio-ICT Synergies* (28-29 June, Sophia Antipolis), *Pervasive Computing and Communications* (27-28 July, Vienna)

and *Software Intensive Systems* (9-10 September, Koblenz). Coming workshops include: *Nano-electronics and Nanotechnologies* (11-12 October, Brussels)

and *Security, Dependability and Trust* (12 October, Brussels).

The reports from these workshops will become available at <http://www.beyond-the-horizon.net> and web-forums in the respective thematic areas will be created for your comments and contributions online. We are looking forward to your active participation!

Inside this issue:

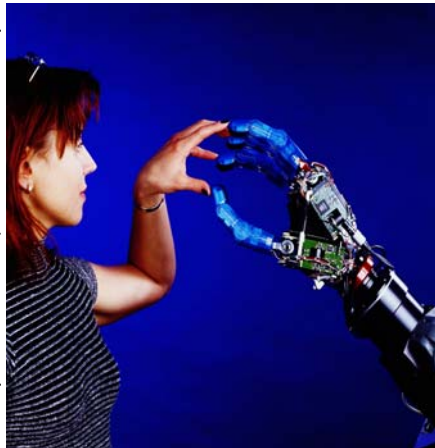
EUROP, the European Robotics Platform is being launched	2
EURON, the European Robotics Network of Excellence	2
nEUro-IT Thematic Network	2
ArteSmit: Coming to grips with robot learning	3
CYBERHAND: winner of the Well-Tech Award 2005	3
CIRCE: bat-bot boosts sonar research	3
SWARM-BOTS: The first realisation of a swarm of self-assembling robots	4
A Molecular Magnetic Switch that links the Biological and Silicon Worlds	4
DEGAS: Universal software, universal appeal	4
New projects to be negotiated following Call 4 Evaluation	5
Ethical Issues in Proposals and Reviews	5
QIPC Initiative: Conference in Vienna	6



EUROP, the European Robotics Platform is being launched

During the last 9 months, a new robotics initiative has been set up by leading European companies in robotics that have decided to join forces in order to foster the development of 21st century robotic technologies. This initiative, called EUROP – *the European robotics platform* – has been endorsed so far by more than 50 top European organisations and is chaired by the SAFRAN (merge of SNECMA and SAGEM).

EUROP aims to establish a consolidated European strategy in robotics for preparing a new generation of robots that will closely collaborate



with workers and move out of the factory to discover a new wave of novel consumer, service, security and space application markets. The vision of the initiative is highlighted in a document “Building EUROP, the European Robotics Platform: The High Level View”. The ambition is that European industry becomes world leader in existing or emerging robotic market segments, ranging from industrial automation to service, security and space robotics.

More info:

<ftp://ftp.cordis.lu/pub/ist/docs/fet/rob-plat-1.pdf>

<http://www.roboticsplatform.com>

EURON, the European Robotics Network of Excellence

EURON, the European Robotics Network of Excellence (<http://www.euron.org>) involving more than 150 robotics research organisations from all over Europe had its first review meeting in June. During the first year of operation EURON has achieved successful operation and implemented a very diverse package of activities. EURON regularly published calls for ad-hoc research activities (assessment-projects, ateliers and interest groups). This has turned out to be a very useful mechanism for community involvement in a network. Other activities in-



clude education and training (summer schools, PhD awards, curricula analysis), dissemination (notably the Springer STAR book series and regular EURON columns in the IEEE Robotics & Automation Magazine), links with industry through dedicated workshops and the technology transfer award, as well as research road-mapping efforts.

An article on EURON was published in the June 2005 issue of the Robotics & Automation Magazine.

The EURON board has recently decided to launch the organisation of EUROS-06, the first *European Robotics Symposium*, 16-18 March 2006, Palermo, Italy. The Call for Papers will be advertised shortly in the EURON and FET web pages.

nEUro-IT Thematic Network

nEUro-IT.net is a Thematic Network that brings together neuroscientists and IT oriented researchers. It acts as a central forum and a pivot point for the FET-funded research initiatives in neuro-informatics, organizing a multitude of activities in the emerging area of "Neuro-IT".

The general idea is that now the time is ripe for IT to profit from recent findings in neuro and cognitive sciences. To this end, the network has implemented road-map activities, workshops, start-up measures and a highly successful summer school. Hence, nEUro-IT.net has been instrumental in leveraging research efforts in a field that has just started to take shape.

The project is now in a phase where it is looking for

new partners with an interest in Neuro-IT from outside the fields of neuroscience and robotics, to complement the current active members of the steering committee. These partners must have a strong interest in active participation in nEUro-IT.net's activities.

More info: <http://www.neuro-it.net>

or contact:

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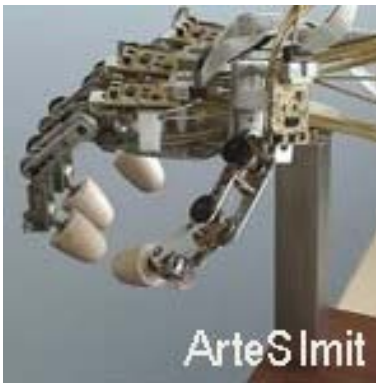


ArteSimit: Coming to grips with robot learning

A “living” artificial hand that learns through imitation has been developed by ArteSimit project, enhancing human-machine communication and paving the way for novel prosthetic aides.

Exploring the functional and neuropsychological mechanisms of imitation learning was the aim of the ArteSimit project. The goal was to reveal the neurophysiological structures for finger and hand movements in humans and monkeys, and design a computer-operational dynamic functional visual-motor system for a limited domain to control a bio-analogue hand, which is thus capable of mimicking imitation behaviour.

The system implements the full visual serving loop in that it observes the environment with a camera, recognises the instructor’s gestures from a set of predefined gestures, makes the necessary decisions to achieve the goal, i.e. the appropriate sequence of actions of the arm,



hand and finger movements. This is optimised in such a way that it is achieved with the minimum amount of motion. The visual system is highly innovative and unique: It recognises finger positions in a precise way through a novel algorithm with just one camera.

“Our final objective was to implement imitational learning on this artificial hand and to suggest applications of the new methods and models to other artefacts with many degrees of freedom that cooperate with humans”, says Alois Knoll from Technische Universitat Munchen and co-ordinator of the ArteSimit project. The ArteSimit project was also referenced in a recent article of ACM Tech News.

More info:

<http://www.acm.org/technews/articles/2005-7/0909f.html#item7>
<http://istresults.cordis.lu/index.cfm?section=news&tpl=article&ID=78359>
<http://www.neuro-it.net/Activities/Leuven2002/ARTESIMIT>

CYBERHAND: winner of the Well-Tech Award 2005

The Well-Tech Award (stands for "Technology for Well-ness") is an Italian contest where in a first phase 60 high technology products are selected. Selection criteria are based on features like outstanding technological innovation, and values such as sustainability, accessibility and quality of life.

In a second phase one product/concept is selected as winner. In this second phase the selection criteria include energy consumption reduction, application of renewable materials and energy, ease of use for elderly and people with disabilities, appropriate use of technologies and materials, and the functional, qualitative and communicative values of the product.

The CYBERHAND project was the winner of the 2005 award (<http://www.well-tech.it>) and the ceremony took place at the National Museum of Science and Technology in Milan. The project developed a new kind of hand prosthesis that overcomes some of the drawbacks of previous systems. Project results have been published also on BBC World news.



More info:

http://bbcworld.com/content/clickonline_archive_35_2004.asp?pageid=666&co_pageid=3
http://news.bbc.co.uk/1/hi/programmes/click_online/3580996.stm
<http://www.cyberhand.org/>

CIRCE: bat-bot boosts sonar research

Bats can navigate mainly in the dark through the air using sound. The CIRCE project developed a bionic head that mimics a bat’s sensory talent. This helps scientists understand how the animals move around and can lead to a more advanced sonar-based navigation methods for land-based robots.

“The CIRCE bat head, measuring about 6 cm³ is about the same size as the head of a large bat. It has a transmitter capable of generating all natural bat sounds and two ears spaced 3 cm apart, corresponding to the distance be-

tween actual bat ears, that can pan and tilt while receiving reflected sound” says Herbert Peremans, head of the Active Perception Lab of the University of Antwerp.

The work on CIRCE will continue in the new integrated project CILIA. The twofold principal objective of CILIA is to identify the common principles underlying the widespread use in nature of arrays of mechanical sensory cells for the extraction of meaning under adverse conditions and to make those principles available for the design of engineered systems.

<http://istresults.cordis.lu/index.cfm/section/news/tpl/article/Browsing>
<http://www.mip.sdu.dk/~rolfm/project/circe.html>

Discovery Channel news:

<http://dsc.discovery.com/news/briefs/20050829/batbot.html>

SWARM-BOTS: The first realization of a swarm of self-assembling robots

The SWARM-BOTS project (<http://www.swarm-bots.org>) has studied autonomous self-assembly, a widely observed behaviour in insect societies, in swarms of up to 35 robots. The mobile autonomous robots built by the consortium, called s-bots, are 12 cm in diameter, weigh 700 g, with 50 sensors and 9 actuators, have gripping capabilities. Using their sensory and gripping apparatus in combination, independent s-bots can autonomously self-assemble into a larger aggregate robot (called a swarm-bot). Swarm-bots with larger numbers of constituent s-bots can tackle increasingly difficult tasks. To make the system scalable, each s-bot is controlled independently and has access only to locally available information. Experiments have shown the ability of s-bots to autonomously self-assemble under a variety of conditions (e.g., different types of rough terrain) into swarm-bots com-

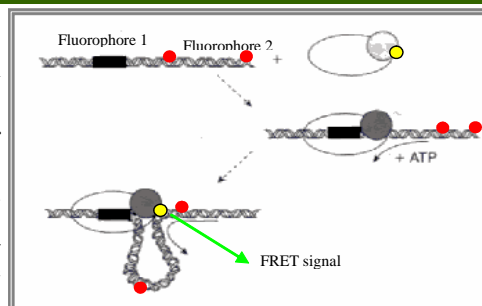


prising up to 16 physical robots. These swarm-bots have been used to transport heavy objects or to cross holes that a single s-bot could not have managed.

A summary of the project results has been published in the June 2005 issue of the *Robotics & Automation Magazine* and the project was recently covered by Swiss TV. The project coordinator, Dr. Marco Dorigo, one of the founders of the swarm intelligence and swarm robotics research fields, will be awarded next November 2005 the prestigious «Prix Dr A. De Leeuw-Damry-Bourlart», worth 75,000 EUR, for his contributions to artificial intelligence and robotics. Also in November, Dr. Francesco Mondada, one of the main designers of the swarm-bot at EPFL, Lausanne, will be awarded the Swiss Latsis University prize, worth 16,500 EUR, for his contributions to bio-inspired robotics.

A Molecular Magnetic Switch that links the Biological and Silicon Worlds

The Mol Switch Project uses a biological molecular motor, which 'pulls' DNA, to move a magnetic particle past a silicon-based detector (almost like a single-molecule dynamo). Such a device will not only provide a nanoactuator, but also a molecular switch linking the 'Biological and Silicon Worlds'. This may eventually lead to a new way to interface biological devices with computers. It will have a wide range of uses



A possible approach to single molecule DNA sequencing

from biosensing, through to single-molecule DNA sequencing. The project is now in a position to actually develop a nanoactuator/biosensor device, which will be a generic biosensor for detection of femtomolar concentrations of almost any ligand. This concept is now the basis of a Patent Application by the Mol Switch Consortium.

More info:

<http://www.nanonet.org.uk/molswitch/>

DEGAS: Universal software, universal appeal



The vision of global computer applications is a step closer with the development of tools to create software that can work on any device. The DEGAS project initially defined the key elements of a software program that are common to all devices, like security, and then separated those functions that are specific to one device.

"Essentially, we wanted to address the problem caused by heterogeneous networks, because currently content and software cannot be used on any device or operating system," says project coordinator Mr Corrado Priami, Computer and Telecommunications department of the University of Trento, Italy.

The project developed a theory to handle heterogeneous networks and produced a set of tools to write software for use on a broad range of devices. Specifically, they developed a mobile adventure game and a mobile commerce solution.

In fact, the project was so successful that the mobile e-commerce software it developed, which works on a wide variety of handsets, was immediately used for commercial deployment by the industrial partner Motorola.

This work will continue in the just started SENSORIA project.

More info: <http://www.omnys.it/degas/>

New projects to be negotiated following Call 4 Evaluation

The 4th IST Call, published on 1/12/2004, invited proposals for IPs and NoEs for FET Proactive Initiatives in the areas of: (i) Advanced Computing Architectures (ACA), (ii) Presence and Interaction in Mixed Reality Environments (Presence) and (iii) Situated and Autonomic Communications (SAC). A total of 43 proposals (41 IPs and 2 NoEs) were received and the retained 11 proposals currently under negotiations are:

SHAPES (ACA): investigates a scalable, heterogeneous multi-tile-based hardware architecture linked through a distributed packet switching network, as well as an efficient programming environment based on a layered system software that is fully aware of the underlying hardware architecture.

SCALA (ACA): targets advances in performance-scalable computer architecture. It focuses on a systematic scalable approach to systems design that grows with advances in underlying technology and with future application domains.

AETHER (ACA): a technology-driven long-term research project targeting projected requirements of wearable and complex systems. It proposes novel solutions based on self-adaptive technology in processor architectures, operating environments, programming and systems composition.

PRESENCIA (PRESENCE): aims at understanding and exploiting brain mechanisms for presence response in MR environments during interaction between real/virtual people, based on a core notion of correlational presence that pervades the different research lines proposed.

IPCITY (PRESENCE): provides technology for citizens

and urban professionals that enables them to envision, debate and experience their urban environment, using easily deployable, mobile & wearable augmented reality setups.

PASION (PRESENCE): aims to develop quite light weight, low cost devices that support non-verbal and implicit communication for enriching social presence experiences, taking into account gestural and emotional information in distance communication and interaction.

IMMERSENCE (PRESENCE): deals with multi-modal inactive immersion in virtual and augmented reality with focus on hand-based haptic tasks, such as person to object interaction, direct person to person interaction, and person to person interaction mediated by an object.

BIONETS (SAC): proposes an integrated biologically-inspired approach to enable autonomic communication services in large-scale wireless network environments.

ANA (SAC): aims at developing a novel network architecture that can enable a flexible and autonomic formation of network nodes. Its objectives are mainly focused on studying adaptation/reorganization of the network.

HAGGLE (SAC): aims at developing a new network architecture to tolerate intermittent connectivity. In this new architecture, message forwarding is driven by the application rather than by only control information of the network layer.

CASCADAS (SAC): aims at developing a common abstraction level for autonomic communication services. Situation awareness, semantic self-organization, self-similarity, and autonomic component-ware will be especially studied.

Ethical Issues in Proposals and Reviews

In FP6, a number of ethical rules have been set. All the research activities must be carried out in compliance with fundamental ethical principles. A system of ethical reviews covering all the activities of the FP has been set up to implement this regulation. Any proposal ranked for funding must, if it raises sensitive ethical issues, be submitted to an ethical review as part of the evaluation and selection process.

The ethical reviews are organised as separate sessions by DG Research. They are carried out by interdisciplinary panels of about 10 external experts. The panel includes ethicists, philosophers, social scientists, medics, experts in the relevant science and in regulatory law. For research involving animals, they will always include at least one animal welfare specialist. The panel members assess the ethical issues associated with the project and produce a report which may indicate whether for instance the choice of species and number of animals is ethically justified. The review report normally indicates the ethical issues detected and lists requirements which the proposers must contractually comply with in order to be funded.

Every year a few research proposals retained in FET evaluations are subjected to ethical reviews. Sensitive ethical issues most often appear in multidisciplinary information technology - life sciences projects, specifically in the Neuro-IT and Presence domains. During the last year these issues have mainly dealt with animal experiments, privacy, clinical trials, informed consent, and possible unintended uses of the results.

In the extreme case, the recommendations and requirements laid down by the ethical review may lead to an exclusion of the proposal from its funding from the Commission. However, usually these recommendations are taken into account and implemented in the project work-plan during contract negotiations. Typical measures include clarifications in the research protocols, requirements for local ethical approvals or continued follow-up and review of the work by the ethical panel. Some FET projects have included internal ethical panels to monitor and advise the research when touching sensitive ethical issues.



More info: <ftp://ftp.cordis.lu/pub/ist/docs/fet/ethical.pdf>
http://europa.eu.int/comm/research/science-society/ethics/rules_en.html

QIPC Initiative: conference in Vienna

The *QUPON (Quantum Physics of Nature) Conference* took place on May 20 – 24. (<http://www.quantum.univie.ac.at/QUPON/index.htm>) The event was organized in the occasion of the 60th birthday of Prof. Anton Zeilinger, one of the world leading scientists in quantum information and communication. The traditional *Sixth European QIPC Workshop* took place on 25 and 26 May. These events gathered over 350 scientists from all over the world. This was the most important QIPC event in Europe during this year. Scientific talks were given by representatives of almost all running FET QIPC projects. There were also presentations on the three new FET integrated projects SCALA, QAP, and EuroSQIP. (Negotiations for these projects have been completed successfully. The total EU funding is of 25 M€ and they are to start in November 2005 for 4 years.) A two hour special session organized by FET was dedicated to the preparations of FP7. An update was given on the actions undertaken during the last year (see below) and plans for future actions were discussed.

The roadmap document “**QIPC - Strategic report on current status, visions and goals for research in Europe**” was written by the most prominent scien-

tists in the field. This was really a community effort, as it can be seen from the substantial list of contributors. The editing author is Prof. Peter Zoller from the University of Innsbruck. On 21/04/2005 a stable version of the strategic report was published on the FET and on the ERA Pilot – QIST project web sites with the goal to initiate a broader discussion and receive feedback from the research community in order to make appropriate corrections. The Roadmap will soon be printed as an EC publication. As it is a living document, it will be regularly updated in the future.

The publication “QIPC in Europe” is a collection of 30 articles in popular science style written by 58 of the most prominent experts in Europe. It was coordinated and edited by FET. It gives a balanced overview of QIPC research in Europe and refers to work accomplished within the framework of EC and nationally funded projects. The entire text is available on the FET web site and will appear as an EC publication towards the end of 2005.

The strategic report and the publication are important milestones along the way towards elaborating a common European strategy in QIPC.

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

Other important issues and ongoing activities:

1. *FET Open call CLOSED on 20th September 2005. The evaluation process has just started.* (<http://www.cordis.lu/ist/fet/int-o.htm>)
2. *FET Call 5 on Proactive Initiative: Simulation Emergent Properties in Complex Systems (STREPS) also CLOSED on 21st September 2005. The evaluation process has just started.* (<http://www.cordis.lu/ist/fet/co.htm>)

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