

## ICT 2008 - Sessions related to Robotics

Based in ICT 2008 Conference Programme (2008/11/19).

More info : [http://ec.europa.eu/information\\_society/events/ict/2008/index\\_en.htm](http://ec.europa.eu/information_society/events/ict/2008/index_en.htm)

Note : In Acrobat, hold down the Shift key and click a link to open it automatically in your browser.

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# 1. Conference programme

## Day 1: Tuesday 25th November 2008

14.00-15.30 : 3 - Inventing the future (Parallel sessions)

3b [Sensing, Understanding Robotics](#)

[Auditorium Pasteur]

[http://ec.europa.eu/information\\_society/events/cf/item-display.cfm?id=752](http://ec.europa.eu/information_society/events/cf/item-display.cfm?id=752)

### Sensing, Understanding Robotics

**Auditorium Pasteur, 25/11/2008 (14:00-15:30)**

Technical devices and systems could deliver greatly improved services if they were able to sense actively and understand the world around them in ways that match their users' expectations and demands. Cheap, miniaturised sensors and abundant computing power, new materials and networking technologies, are now bringing such capabilities within reach of industrial realisation.

In this session key research and engineering issues will be highlighted in addition to the benefits gained from this research in terms of new or enhanced products, and fresh opportunities for sustainable growth.

Specific topics that will be addressed include:

- What robots sense and do;
- Robots that understand;
- Robots that learn;
- Making and selling robots.

Chair: [Danica KRAGIC](#) (KTH, Stockholm, , Sweden)

#### Featuring

[Jeremy WYATT](#) (University of Birmingham, UK, School of Computer Science, United Kingdom)

[Ralf KOEPPE](#) (KUKA Roboter GmbH, Research & Development, Germany)

[Bruno SICILIANO](#) (Università di Napoli Federico II, Dipartimento di Informatica e Sistemistica, Italy)

[Sethu VIJAYAKUMAR](#) (University of Edinburgh, School of Informatics, United Kingdom)

Session organiser: [Bjoern JURETZKI](#) (European Commission, Unit E5 - Cognitive Systems, Interaction, Robotics, Luxembourg)

## Day 2 : Wednesday 26th November 2008

09.00 - 10.30 : ICT Work Programme 2009-2010

6d [Cognitive systems and robotic systems](#)

### Cognitive systems and robotic systems

**Auditorium Pasteur, 26/11/2008 (9:00-10:30)**

The goal of this session is to inform the European robotics and cognitive systems community about Challenge 2 of the new Work Programme. Challenge 2 deals with cognitive systems, interaction and robotics. It will advise the community on new funding opportunities, the timing and contents of Calls for Proposals and what is expected from these calls. In addition, the session will also feature presentations about robotics and cognitive systems research from both an industrial and academic perspective. There will be a Q&A session where the audience can clarify open questions.

**Session agenda/Choreography:**

After a short introduction round by Libor Kral, Vaclav Hlavac will give his presentation which will be followed by the presentation from Geoff Pegman. Libor Kral will then give the main presentation on the work programme which will be followed by a Q&A session with the audience. Presentations will be about 20 minutes each.

Chair: [Libor KRÁL](#) (European Commission, DG Information Society and Media, Unit E5 - Cognitive Systems, Interaction, Robotics, Luxembourg)

**Featuring**

[Libor KRÁL](#) (European Commission)

[Vaclav HLAVAC](#) (Czech Technical University in Prague, Faculty of Electrical Engineering, Department of Cybernetics, Czech Republic)

[Geoff PEGMAN](#) (R U Robots Limited, Director, United Kingdom)

Session organiser: [Bjoern JURETZKI](#) (European Commission, Unit E5 - Cognitive Systems, Interaction, Robotics, Luxembourg)

## 2. Exhibition Area

ICT 2008 :: [Exhibition](#) :

**Zone C: SME village : Innovative small businesses, implementing ICT research results**

### C.06 [Aldebaran Robotics](#)

#### Meet NAO - a small size entertainment robot

The first all dancing, all interacting humanoid robot offering numerous possibilities Aldebaran Robotics first-generation robot, called Nao, is a medium size (57cm) entertainment robot that includes a computer and networking capabilities at its core. Its open, programmable and evolving platform can handle multiple applications and is currently the most evolved humanoid robot available on the market. Visitors will be able to see the robot in action as it walks, dances, interacts via voice, detects objects, or gets information from the Internet. Release beyond academics and professional markets is expected by 2010 by which time Nao will be able to do even more such as interacting with humans in "real life" situations.

[Technical description](#)

Coordinator: [Petra KOUDELKOVA](#)

#### Links and Documents

- [Press Reviews](#)

**Zone G: ICT gets smart - Increasing intelligence within ICT applications**

### G.03 [RobotCub](#) - A child-like Humanoid Robot equipped with Vision, Hearing and Touch

#### RoboCub : Humanoid robots designed as platforms for research in artificial cognition

The technologies developed on the project's iCub platform – such as grasping, locomotion, interaction, and language-action association – put the EU at the forefront of robot research. iCub robots are the size of a three-year-old child, with dexterous hands and articulated heads and eyes. They have vision, hearing and touch capabilities and can crawl on all fours and sit up. The demonstration will show iCub's range of behaviours, such as drumming or reaching out to touch objects. Visitors will be able to interact with the iCub by first moving objects in front of it, and then asking the robot to reach out and touch them. The project developed the iCub as an open source testing bed, allowing other researchers to adapt the robot and its software to their needs.

[Technical description](#)

Coordinator: [Giorgio METTA](#)

#### Links and Documents

- [A picture of the iCub](#) (733 KB)

- [Assorted pictures and videos from the RobotCub.org website](#)
- [RobotCub website](#)

## **G.10 [FEELIX GROWING](#) - Affective Social Robots that Live and Grow with Us**

Developing robots that can interact with humans and their environment in an autonomous and user-centred way

If robots are to be truly integrated into humans' everyday environments to provide such services as care giving, entertainment, patient monitoring, and aids to therapy, they cannot be pre-designed then taken off the shelf and embedded into real-life settings. Adaptation to their environment and personalisation to their human users are necessary to achieve successful long-term integration. Although a partial solution can be provided by allowing robots to learn from their experiences with user and environment, fuller and deeper integration will mean that robots 'grow' embedded in the social environment in which they will fulfil their roles. This research focuses on the most distinctive feature of such environments and on development within them: their social, interactive, and emotional nature. The exhibit will explain and demonstrate this approach, using live interactive robotic demos and videos.

### [Technical description](#)

Coordinator: [Lola CAÑAMERO](#)

### **Links and Documents**

- [Felix Growing on BBC News](#)
- [Felix Growing portal](#)
- [Wikipedia entry "Felix Growing"](#)

## **Zone H: ICT inside - Advances in components and embedded systems technologies**

### **H.01 [SENSORIA and the ROBOTS](#)**

#### **Sensoria : Software Engineering for Service-Oriented Overlay Computers : a robots demo**

Developing a novel, comprehensive approach to service-oriented computing

Service-oriented computing is an emerging concept for developing widely distributed, interoperable, evolvable computer systems and applications. SENSORIA aims to develop a novel, comprehensive approach to the engineering of software systems for service-oriented overlay computers. It focuses on global services that can be adapted to context and users, while taking into account that services are deployed globally on different, possibly interoperating, computers. The expected results include a new, generalised concept of service for global overlay computers, new mathematical analysis and verification techniques, and tools for system behaviour and quality of service properties. The range of applications include e-business, automotive systems and telecommunications.

### [Technical description](#)

Coordinator: [Paola FANTINI](#)

### **Links and Documents**

- [Sensoria Project - Software Engineering for Service-Oriented Overlay Computers](#)

## H.08 [REPLICATOR](#) - Robotic Evolutionary Self-Programming and Self-Assembling Organisms

**Developing robots that can work together independently – potential applications in emergency rescue situations**

The REPLICATOR project is developing mobile micro-robots capable of swarming together autonomously to form larger, artificial organisms. These robots are able to share resources and communicate with one another, generating even greater computational power. The EU-funded project is focusing on new robotics areas, including self-configuration, self-adjustment and self-learning, with the final goal of developing robotic organisms capable of spreading and self-maintaining in uncertain situations without human supervision. In the event of an earthquake, for example, the mini-bots could disassemble to enter a collapsed building and then reassemble once inside to search autonomously for victims.

### [Technical description](#)

Coordinator: [Alfons SALDEN](#)

### Links and Documents

- [\(Un\)Docking of REPLICATOR Micro-Robots](#) (560 KB)
- [Robotic Evolutionary Self-programming and Self-Assembling Organisms](#) (1 MB)
- [Simulation of Kinematics of REPLICATOR](#) (2 MB)

## H.11 [OpenEmbeDD](#) - Drawing robot driven through the OpenEmbeDD platform

**Testing out embedded software systems, such as those found in robots, on computer models before they are deployed**

The OpenEmbeDD platform provides model-driven engineering tools to design, simulate, test and generate real-time software for embedded systems, such as those found in robots. The platform is bundled for easy installation. The exhibit will show engineers and end-users how models can help build and secure programs for electronic appliances. Using a graphic modeller, delegates will be able to define actions to be performed by a robot built from LEGO Mindstorms. These actions will then be run on a visual simulator where the user can verify the correctness of the commands. Once the model is deemed correct, a couple of clicks transform these instructions into the robot's programming language and transmit them to the machine for execution via a wireless Bluetooth connection.

### [Technical description](#)

Coordinator: [Vincent MAHÉ](#)

### Links and Documents

- [The robot draws a square](#) (2 MB)

## **Zone I: ICT environmental - ICT for sustainable development and environmental management**

### **I.03 [DustBot](#) - Networked and Cooperating Robots for Urban Hygiene**

A system for improving the management of urban hygiene using autonomous and co-operating robots, embedded in an ambient intelligence infrastructure

The robots will be able to clean public spaces and to collect small quantities of home waste. Using preloaded information on the environment and inputs from onboard and external sensory systems, and taking advantage of the ambient intelligence platform, the robot will be able to move with a proper (and adaptable) level of autonomy to carry out its tasks. The robots will be also equipped with multiple sensors for air monitoring, giving information on the environmental quality in real time. The exhibit will include the demonstration of DustBot robots and the stand will be equipped with a minimum infrastructure for simulating the urban environment and the typical tasks of the robots. Visitors will be able to interact with the robots and the stand will also have further information about the project.

#### [Technical description](#)

Coordinator: [Paolo DARIO](#)

#### **Links and Documents**

- [\(Untitled\)](#)
- [\(Untitled\)](#) (241 KB)
- [\(Untitled\)](#) (220 KB)

### **I.04 [μDrones](#) - Autonomous Micro Drones for environment sensing**

An unmanned flying vehicle designed to offer a new surveillance method for both public and private sites

Mobile multi-sensor surveillance systems, able to be deployed quickly to analyse a situation, can enhance security provision. In this context, unmanned aerial vehicles (UAVs) provide new opportunities for research in environment sensing. The μDrones project aims to develop a small-sized vertical take off and landing (VTOL) UAV designed for autonomous inspection and survey tasks. The project is largely focused on the development of software and hardware modules to allow for the autonomy of a small-sized drone in terms of navigation, localisation and robustness to unexpected events, such as obstacles, communication loss, GPS loss or turbulence. The project also looks at developing a mission control system with an intuitive man-machine interface; perception and command for complete flight autonomy; and μUAV conception and development.

#### [Technical description](#)

Coordinator: [Jean-Marc ALEXANDRE](#)

#### **Links and Documents**

[μdrones general presentation \(video on project Website\)](#)

## 3. Networking Session

### Day 1: Tuesday 25th November 2008

14.00-15.30 : Networking Session

#### **N.2 Ambient Assisted Living - Virtual User Platforms**

**Roseraie 2**

User-centred co-design enabled by Virtual User Experimentoria and Usability Modelling Frameworks requires an integrated research agenda; to be included in the discussions:

- Establishing Generalisation Ontologies to encompass ontologies for prototypical AAL applications
- Semantic workflow modelling, Semantic-cooperative modelling of interacting AAL agents
- ICT-Augmented multi-modal environments for user-proxies engagement through visualisation, dynamic interactive simulation, supported by user-centred co-design and VR-augmented platforms and paradigms such as Living Labs, EAR
- Stakeholders' needs conflict resolution and needs prioritisation methods
- Online self-report and bio-feedback to capture and integrate dynamic usability relationship evaluation data
- Mining the usability relationships data intelligence to discover new needs prioritisation to inform ontology revision and user model updates; to enable the re-engineering and refinements for dynamic adaptation

Web site: <http://www.companionable.net>

Coordinator: [Atta BADI](#)

#### **Links and Documents**

- [Agenda](#)
- [The CompanionAble Project Web Site](#)
- [The ICT2008 Networking Session - Ambient Assisted Living - Virtual User Platforms](#) (262 KB)

### Day 2 : Wednesday 26th November 2008

11.00-12.30 : Networking Session

#### **N.51 The iCub and friends forum**

**Tete d'Or 1+2**

The iCub is the humanoid robot designed by the RobotCub project. It addresses the community by being open source and by supporting the realization of several copies of the robot for research groups across Europe.

Our goal here is to draw together users, prospective users, and researchers that already adopted some of the robot's hardware & software or that are just curious about it. We target this community and we would like to show the benefit of open standardization (where the users actively contribute to a dynamic standard).

In particular, both the hardware of the robot and its software are being used by several groups and adopted in different EU-funded projects.

Cognitive systems is an active community, tackling difficult problems with a variety of techniques and methods. We would like to show and discuss the standardization of some of these results around a common

robotic platform.

We hope to make the iCub the platform of choice in embodied cognitive systems research.

Web site: <http://www.robotcub.org>

Coordinator: [Giorgio METTA](#)

#### Links and Documents

- [Agenda](#)
- [A picture of the iCub](#) (733 KB)
- [The RobotCub software](#)

11.00-12.30 : Networking Session

### **N.53 New directions with brain- computer interfaces (BCIs)**

**Salle Bellecour 1**

This networking session aims to bring together professionals from different sectors, backgrounds, and disciplines to discuss BCI applications for both conventional users (persons with severe disabilities) and emerging new user groups. Topics will include:

- 1) Target situations and user groups: when would which people need BCIs?
- 2) New sensor systems
- 3) New applications
- 4) Interface development
- 5) Software integration
- 6) Improving usability
- 7) Improved rehabilitation robotics
- 8) Challenging BCI illiteracy
- 9) BCI integration: producing complete BCI systems
- 10) Future funding directions

Experts will consider where BCIs will be in 10 or 20 years, what new technologies will be needed to get there, and how progress in related technologies might affect BCI development. While the main focus will be on practical applications for BCIs, new academic research opportunities will also be addressed.

Web site: <http://www3.iat.uni-bremen.de/sixcms/detail.php?id=663>

Coordinator: [Brendan ALLISON](#)

[Agenda](#)

14.00-15.30 : Networking Session

### **N.66 Synergetics of Robots and Environment**

**Salle Rhône 4**

Bio-inspired swarms of micro-robots that self-assemble to an organism and display purposeful functional behaviour, cannot yet satisfactorily master their own and environmental morpho-dynamics. Synergetics [1], however, provides such multi-robots a sound mathematical-physical basis for the self-formation and the self-organization of efficient, robust and fit modular structures and functional organizations capable of withstanding even evolutionary pressures. This new paradigm ultimately will boost many areas such as industrial design, crisis management, and micro-surgery.

In this workshop organised by the REPLICATOR project [2], Prof. Dr. Haken will give a keynote speech

on the importance of this new paradigm for the future Information Society and Technology. In addition, experts from the field of robotics and others are invited to present related work and to participate in a brainstorm discussion about its pros and cons.

Contact: Paul.Levi@ipvs.uni-stuttgart.de

Web site: <http://www.replicators.eu/>

Coordinator: [Alfons SALDEN](#)

#### Links and Documents

- [Agenda](#)
- [Center for Synergetics](#)
- [FP7 Integrated Project REPLICATOR](#)

### **Day 3: Thursday 27th November 2008**

11.00-12.30 : Networking Session

#### **N.118 Humanoid Robotics**

**Passage Foyer Lumiere**

Robotics becomes increasingly important part of research & development agenda in Europe. This networking session will discuss some of the challenges and perspectives of Humanoid Robotics developing towards more accessible, interactive, cognitive and autonomous platforms.

ALDEBARAN Robotics is one of the few European companies working in the design and supply of robots, and the only one producing humanoid robots. NAO, the ALDEBARAN's 1st generation humanoid, is a small size entertainment humanoid robot. It is an open, programmable and interactive platform already used for research finalities.

What are the two main challenges for the future?

The first one is the hardware challenge. Complete and make evolve the mechatronic structure: sensors, robotic head, hands... The second challenge consists in cognition, interaction and software development.

Web site: <http://www.aldebaran-robotics.com>

Coordinator: [Petra KOUDELKOVA](#)

#### Links and Documents

- [Agenda](#)
- [ALDEBARAN Robotics](#)