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The "EURON/ERF Technology Transfer Award" was created in order to improve the quality of robotics research and to raise the profile of technology transfer between science and industry and was presented for the first time by the European Robotics Research Network (EURON) at its annual meeting on 13 March 2004 together with the European Robotics Forum (ERF) in Amsterdam and it is now to be presented annually.

"The goal of EURON is to create a network of excellence intended to coordinate research work, teaching and education as well as the collaboration between academia and industry," explained Henrik Iskov Christensen, EURON coordinator and professor at the Centre for Autonomous Systems at Kungliga Tekniska Hogskolan in Stockholm.

The European Robotics Forum is a European industry platform within the International Federation of Robotics (IFR). Stefan Sagert from VDMA Robotik + Automation is the General Secretary of the ERF, which has set itself the goal of increasing the visibility of the robotics community in Europe.

The winners of the first EURON/ERF Technology Award are:

1st place: Dr. Martin Otter, German Aerospace Centre Oberpfaffenhofen (DLR), Institute of Robotics and Mechatronics, Wessling, Germany for 'High Performance Industrial Robots - The DLR-KUKA Success Story'.

2nd place: Dr. Olivier Michel, Cyberbotics Ltd., Switzerland, for his project: "Webots™ Fast Prototyping and Simulation Software for Mobile Robot Technology".

3rd place: Frank Beeh, Institute of Process Control, Automation and Robotics (IPR), University of Karlsruhe (TH) for developing an innovative seat testing system.



The members of the jury were:

Press Release EURON/erf Technology Award (DRAFT)

- Thilo Brodtmann (VDMA, ERF secretariat)
- Henrik Christensen (Kungliga Tekniska Hoegskolan Stockholm, EURON)
- Martin Hägele (Fraunhofer IPA, EURON key area "Industrial Relations")
- Gisbert Lawitzky (Siemens AG)
- Erwin Prassler (Gesellschaft für Produktionssysteme, EURON key area "Industrial Relations")
- Hans Skoog (ABB)

This first EURON/ERF Technology Award was sponsored by the European Commission, Asea Brown Boveri Ltd. (ABB), Rexroth Bosch Group, Reis Robotics, Güdel AG, Fanuc Robotics and Kuka Roboter GmbH. It is planned continuously to raise the profile of the Technology Award in the coming years and to increase public awareness of the Award.

The authors of this column want to thank Martin Hägele for providing material for this report. Parties interested in promoting certain activities via this column can contact either Kostas Kyriakopoulos (<http://users.ntua.gr/kkyria>, kkyria@central.ntua.gr) or Bruno Siciliano (<http://cds.unina.it/~sicilian>, siciliano@unina.it).

The FET (Future & Emerging Technologies) program (<http://www.cordis.lu/ist/fet>) of IST (Information Society Technologies) program of the Information Society Directorate General of the European Commission is to promote long-term research aiming at opening new possibilities for future research programs. Towards that target, for the 7th framework program FET set proactive activities such as Beyond Robotics, Complex Systems Research and Disappearing Computer etc.

“Beyond Robotics” (see: <http://www.cordis.lu/ist/fetro.htm>) was launched in 2003 in order to promote European research in the area. The initiative concentrated on three specific objectives:

- The development of cognitive robots whose "purpose in life" would be to serve humans as assistants or "companions",
- Hybrid bionic systems that would augment human capabilities such as perception of the environment, motion, interaction with other humans etc., and
- The development of autonomous microrobot groups ('robot ecologies'), consisting of many heterogeneous members exhibiting collective behaviour and intelligence.

Towards the first objective, project COGNIRON (“*The Cognitive Robot Companion*” - <http://www.cogniron.org>) was awarded to ten partners from 7 countries. With a duration of 4 years has a budget ~8M€. The COGNIRON objective is to study the perceptual, representational, reasoning and learning capabilities of embodied robots in human-centered environments. The project aims to develop methods and technologies for the construction of cognitive robots that will be able to evolve and grow their capacities in close interaction with humans, which will be able to serve humans as companions in their daily life. The design of the cognitive functions of this artificial creature and the study and development of the continuous learning, training and education process in the course of which it will mature to a true companion, are the central research themes of the project. Expected results are basic methods, algorithms and architectures and their integration and long-term experimentation and scientific evaluation on embodied robotic systems in different settings and situations.

NEUROBOTICS (“*The fusion of Neuroscience and Robotics for augmenting human capabilities*” - <http://www.neurobotics.info>) was awarded towards the second objective. Sixteen partners from seven European countries in addition to one from the US and one from the Japan will cooperate for 4 years with a budget of 6.7M€. The main objective is to pursue a strategic alliance between Neuroscience and Robotics by exploring the area of Hybrid Bionic Systems (HBSs) to deeply investigate the theme of human augmentation. Starting from the most advanced state of the art in neuroscience, the project will aim at developing new integrated robotic artefacts, as much biomorphic as required to be effectively interfaced with human body and brain. Three robotic platforms featuring different levels of hybridness (i.e. mechanical coupling with the human body) and of connectivity (to the human nervous system) will be developed to be used in experiments on human augmentation: biomimetic scalable artefacts to be remotely controlled by a human operator (beyond tele-operation); intelligent wearable artefacts loosely physically coupled with the human body (beyond prostheses); arm-hand sub-systems tightly physically coupled with the human body (beyond orthoses).

The third objective is the theme of I-SWARM (*“Intelligent Small World Autonomous Robots for Micro-manipulation”* -<http://www.i-swarm.org>) awarded to 10 research teams from 8 countries for 4 years and a budget of ~5M€. Technological problems in miniaturizing systems have to date been huge obstacles towards building artificial "ant robots" which closely co-operate as a swarm. The I-Swarm project wants to be a stepping stone towards an artificial ant (yet, building such an ant robot having all capabilities of natural ants, is still years from now) and aims to take a leap forward in robotics research by combining experts in microrobotics, in distributed and adaptive systems as well as in self-organizing biological swarm systems. The project will produce technological advances to facilitate the mass-production of microrobots, which can then be employed as a "real" swarm consisting of up to 1,000 robot clients. These clients will all be equipped with limited, on-board intelligence. The swarm will consist of a huge number of different robot types, with various sensors, manipulators and computational power. Such a robot swarm can perform a variety of applications, including micro assembly, biological, medical or cleaning tasks.

Contributed by Kostas Kyriakopoulos and Bruno Siciliano.

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The three Integrated Projects funded as part of the 6th framework “Beyond Robotics” initiative of the Future & Emerging Technologies (FET) division of the Information Society Technologies program of the Information Society Directorate General of the European Commission, described in our previous issue, are in the beginning of their 2nd year but the discussions for new robotics related initiatives for the 6th Research and Technological Development Framework Program have started.

As part of this discussion phase, close to 20 experts (40% academia, 60% industry) met with 5 FET officers in Brussels for a brainstorming session on European Robotics, between 8 - 9 November 2004.

Based on the fundamental idea that any new initiative must have a clear value to society in terms of addressing future challenges rather than being purely driven by curiosity, four societal challenges were identified: (i) competitive manufacturing in the global market, (ii) quality of life for the elderly and the disabled, (iii) brain-gain instead of brain-drain for Europe and (iv) advanced research for dual-use (public & strategic) technology.

Those challenges led to five application drivers, defined as robotic systems with significant market potential or socio-economic impact: (a) Hyper-flexible manufacturing systems, (b) Human-robot-collaborative industrial workcells, (c) Robot companions in private and public environments, (d) Personal robots and (e) Ubiquitous robots and robotic networks.

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The Annual Meeting of the European Robotics Research Network (EURON II <http://www.euron.org>) took place February 16-18, 2005 at Warsaw University of Technology, Warsaw, Poland. This annual event was attended by 200+ researchers representing 90+ European research teams. A number of issues of interest to the European robotics research community were addressed. Those included: the EURON annual report, research coordination and roadmap / benchmarks, education and training including summer schools, industrial links efforts, Dissemination and the Robo-ethics Atelier.

This years invited plenary session speakers were Prof. Inoue ("The birth of robotics and its development") and Prof. L. Parker ("Large scale robotics"). Workshops included subjects such as the "European Robotics Roadmap" and "Open Source Robotics" and overview presentations of the three FET Integrated Projects: COGNIRON, NEUROBOTICS and I-SWARM (see March 2005 issue).

For the technology transfer award (see RAM September 2004) of this year, considerations of 10 submissions led to two winners, one for a novel application and another for a deeper science transfer of results. The two winners are:

- Albert-Ludwig Universität - Adp Gauselmann AG, "A Table Soccer Robot" (new product) and
- Lund Institute of Technology - ABB Automation Technologies, "6DOF force-torque control and an open robot controller" (core robotics component).

EURON, within its Education and Training activities, sponsors annually the Georges Giralt Ph. D Award in Robotics in Europe. This action aims at promoting young PhDs. The award is presented during the annual EURON meeting. This year 12 submissions led to a short list of 3:

- Kai Oliver Arras, "Feature-Based Robot Navigation in Known and Unknown Environments", EPFL, Switzerland.
- Juan Andrade Cetto, "Environment Learning for Indoor Mobile Robots", UPC, Spain.
- Tine Lefebvre, "Contact modeling, parameter identification and task planning for autonomous compliant motion using elementary contacts", KU Leuven, Belgium.

The final winner was Juan Cetto

Henrik Christensen, EURON II coordinator, said that, next year, the meeting will be in early March to provide a little more time for the IP projects to prepare for their reviews.

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