CeBIT: Robot obeys commands and gestures

February 24 2012

The ARMAR robot reacts to language and gestures of persons and orients itself independently in the kitchen. Credit: Wolfgang Schaible/KIT

At the CeBIT in Hanover, Karlsruhe Institute of Technology and the FZI Research Center for Information Technology will present innovations for our everyday life in the future. At the joint stand G33 in hall 26, a humanoid kitchen robot will move around, three-dimensional visualizations will open up new perspectives, and new algorithms will be presented to protect data in the cloud. The FZI House of Living Labs will present the interactive HoLLiE service robot and solutions for intelligent energy management.

ARMAR Robot Learns by Watching

A robot helping in the household no longer is a dream of the future. ARMAR, the humanoid robot, can understand commands and execute

them independently. For instance, it gets the milk out of the fridge. Thanks to cameras and sensors, it orients itself in the room, recognizes objects, and grasps them with the necessary sensitivity. Additionally, it reacts to gestures and learns by watching a human colleague how to empty a dishwasher or clean the counter. Thus, it adapts naturally to man's environment. At the CeBIT, ARMAR will show how it moves between a refrigerator, counter, and dishwasher.

A video on ARMAR can be found at:
www.youtube.com/watch?v=5x1G0nkSd9w

Virtual Knowledge for Real Problems

Numerical simulations open up inaccessible rooms. Three-dimensional visual processing of data provides fascinating insights and findings. A surgeon, for instance, can plan cardiac operations on the virtual model that is based on the data of the patient to be treated before he cuts the tissue. Simulations of the lungs yield predictions as to where fine dust has a harmful effect and how this effect can be prevented. In virtual city models, scientists let the air flow to predict where pollen concentrations will increase, such that allergic persons may be informed in due time on their mobile phones as to which quarters of the city they should avoid. Simulations make the world better to live in. With efficient methods, computers can solve complex problems. At the CeBIT, a large-area 3D video wall will give insight into the virtual world, with the models of the heart, lungs, and Karlsruhe city area being presented as examples.

More information on numerical simulations can be found at:
http://www.emcl.kit.edu/index.php

The simulations made under the HiFlow3 project at KIT visualize air flows in the lungs in detail and help understand fine dust depositions. Credit: HiFlow^3/KIT

Safe in the Cloud

For companies, cloud computing is an inexpensive alternative to a computing center. But are sensitive company data at an external computing center protected against both external hackers and insiders? At the CeBIT, the demonstrator will show how this problem is solved: A database is encoded and distributed to three different computing centers. In this way, safe data storage in the cloud is achieved. Even if the hacker possesses insider knowledge of a cloud supplier, he cannot derive any useful information from the data set fragments of one computing center only. The combination of encoding with a smart distribution of the data significantly increases safety against internal and external attacks in the cloud.

More information on applied security technologies can be found at: http://www.iks.kit.edu/?id=409

smartEnergy – Intelligent Energy Management

At the FZI House of Living Labs (HoLL), a novel platform is presently being established to study efficient and economic solutions for the complex energy system of the future. At the CeBIT, the [Energy Management](#) Panel (EMP) will be presented, a graphic interface for interaction between the decentralized energy management system in the building and the user. The user may specify individual parameters for his devices and configure the system according to his requirements. This ensures efficient load management without limiting user comfort. The user is informed about energy consumption and supply of all consumers, producers, and stores. These data increase the user's awareness of energy flows in the building.

More information on the FZI House of Living Labs can be found at: [www.fzi.de/index.php/de/forsch … house-of-living-labs](#)

Strategies for Trustable Hybrid Cloud Computing

Cloud computing offers potentials like dynamic scalability, elasticity, and low costs. Often, however, criteria like reliable service quality, simple connection of the own software stock, and security make companies refrain from the use of cloud computing.At the CeBIT, FZI will present how hybrid cloud computing solves the problem. An analysis and simulation method developed by FZI allows to develop an optimized cloud strategy tailored to the respective customer. Quality properties, such as performance, scalability, reliability, availability, and security, are in the focus. FZI adapts the use of cloud computing to individual needs and supports the decision on whether to use the public cloud, private cloud, or hybrid cloud. At the CeBIT, audriga, the spin-off of FZI and KIT, will present a solution for the safe relocation of groupware data in the cloud. At stand F30 in hall 26, audriga will present how the SaaS

service helps users move their e-mail accounts, photos or files between cloud suppliers in a reliable manner.

More information on audriga can be found at: www.audriga.com

HoLLiE – The Service Robot of FZI

Providing persons, who are in need of care, with food and medicine, joining interactive sports games, offering entertainment, or guiding visitors – the applications of HoLLIE are manifold. The agile, two-armed service robot can be used flexibly in apartments and links robotics, ambient assisted living, and mobility services at FZI. At the CeBIT, HoLLiE (House of Living Labs intelligent Escort) will show how it intuitively interacts with people. Thanks to a modern 3D sensor system, HoLLiE can understand the body movement of its counterpart. In the scenario presented, HoLLiE asks its counterpart to do some sports together in order to remain in good shape. This function may be of therapeutic value to elderly people or people in need of care, but also serve to entertain everybody regardless of age.

More information on service robotics at FZI can be found at: http://www.fzi.de/index.php/de/forschung/fzi-living-labs/fzi-living-lab-service-robotics

Provided by Helmholtz Association of German Research Centres