FZI LIVING LABS: A NEW SERVICE IN RESEARCH TRANSFER

Living Labs present a new research paradigm placing technology transfer and the application environment in the limelight of interdisciplinary research and development. The FZI Living Labs are a new FZI service that transforms ideas from research and development into marketable products. In the FZI Living Labs, project partners from companies and public institutions work together with FZI professors and researchers to design, discuss, evaluate and test concepts, tools, software and systems under real life conditions prior to market launch.

THE IDEA BEHIND OUR FZI LIVING LABS

- Participative research by researchers, experts from industry and users
- Concentrated provision of interdisciplinary, scientific know-how
- Practical trials for engineering and IT applications before market launch
- Thorough try-out of innovative concepts for your products
- Offering feedback of market knowledge into research
- Triggering innovative impulses
- Encouraging exchange between technology and application
- Environment for open innovation

THE FZI HOUSE OF LIVING LABS

House of Living Labs

The FZI House of Living Labs incorporates all FZI Living Labs in one building and offers a modern infrastructure for development, evaluation and demonstration of trend-setting technologies. Researchers from the FZI and partners from industry and society can exchange across fields of application and interdisciplinarily develop integrated solutions in information and communication technology.

Profit from our FZI Living Labs as a platform for integration and technologies!

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RESEARCH ON YOUR BEHALF

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FZI LIVING LAB smartENERGY

ICT-based solutions for the energy system of the future

smartEnergy

FZI

FZI RESEARCH CENTER FOR INFORMATION TECHNOLOGY

FZI LIVING LAB SMARTENERGY

The FZI Living Lab smartEnergy offers an interdisciplinary research environment to develop solutions for the future energy system. The FZI House of Living Labs was equipped with modern technologies to provide, store and use thermal as well as electrical energy in a flexible way. Therefore, in the FZI Living Lab smartEnergy newly developed methods and energy management systems can be tested, evaluated and presented in practice.

Due to the application of ICT and on the basis of an interconnected infrastructure in buildings, smart energy management systems can make a great contribution to the efficient operation of an energy system using renewable energies.

In order to do so, appropriate methods for load management and decentralised provisioning of energy are necessary. Economic coordination mechanisms and flexibility markets create additional incentives for load management, which enable a more efficient use of renewable energies through the automated utilisation of flexibilities. Apart from technologies for the automation of load management and the standardisation of device interfaces, embedded optimisation methods are an essential research topic at the FZI Living Lab smartEnergy.

The connection between different consumers and generators in buildings enables the development of grid-supporting energy management systems. In current projects, we evaluate opportunities for the efficient integration of local energy management systems into the overall energy system as well as for the communication with grid-side stakeholders, for example based on smart metering systems with smart meter gateways and control boxes.

EQUIPMENT

In the FZI House of Living Labs, electricity is generated by decentralised generators. Therefore, a photovoltaic system with a storage system and modern inverters were installed. A combined heat and power plant provides additional thermal energy used for heating in winter and for driving an absorption refrigerator in summer. Due to thermal buffer storages, energy generation and consumption can be decoupled. Individual components are connected by different communication systems, for example EEBus, EnOcean, KNX or Modbus.

The operation of a smart metering infrastructure with different communication gateways and smart meters facilitate the practical development and evaluation of innovative energy management solutions. Furthermore, in context of the FZI Living Lab smartHome communication interfaces of household appliances are extended for the integration into energy management systems.

This way the FZI Living Lab smartEnergy offers optimal equipment for research and development projects regarding energy management systems, on which we work together with our partners from industry and science.

COOPERATION OPPORTUNITIES

The following topics are ideal for cooperation concerning smart grids and smart homes:

- Decentralised energy management for an efficient optimisation of energy flows in buildings
- Smart metering systems and smart meter gateways (control boxes, active/passive external market participants)
- Monetisation of flexibilities via electricity and balancing markets, peak load management, on-site consumption
- Provisioning of system services with decentralised generators and consumers
- Simulation-based potential assessment
- Standardisation of device interfaces
- User interaction and visualisation mechanisms