

Nordallianz „Smart City Tag“, Unterschleißheim, 28.10.2015

## „Smart City - Beispiele für Innovationsprojekte“

Bernhard Schätz

fortiss GmbH  
An-Institut Technische Universität München



## Rechtsform

gemeinnützige GmbH

## Direktorium

Prof. Manfred Broy (Sprecher)  
Prof. Helmut Krcmar  
Prof. Alois Knoll

## Geschäftsleitung

Dr. Harald Rueß

## Übergangsphase

in ein institutionell gefördertes  
Landesinstitut gemäß Beschluss  
der Bayerischen Staatsregierung



# Informationsblatt

- Derzeit sind am fortiss knapp über **100 Mitarbeiter** beschäftigt
- Zusätzlich sind derzeit ca. **40 stud. und wiss. Hilfskräfte** angestellt
- Von den Mitarbeitern verfügen knapp **20** über eine **abgeschlossene Promotion**
- In 2015 wird ein **Projektvolumen** von insgesamt knapp **10 M€** geplant
- Mehr als **50 Forschungsprojekte** laufen gleichzeitig
- **70%** der Einnahmen aus eingeworbenen Drittmittelprojekten, **30%** aus staatlicher Grundförderung (z.B. für Eigenprojekte)

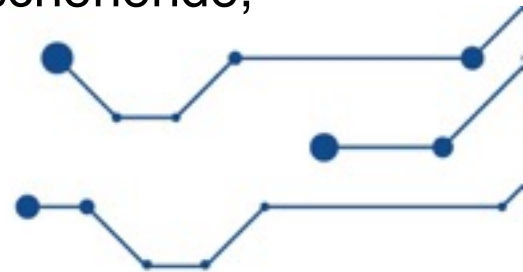
# Themenfelder

Themenfelder	Kontakt	Kurzbeschreibung
Autonomous Systems	Prof. Alois Knoll	Developing and validating software solutions for autonomous systems
Dependability Engineering	Dr. Harald Rueß	Algorithms, methods, and tools for automating the verification and validation of dependable (and secure) software systems
Embedded Systems Software Engineering	Prof. Manfred Hajek	Model-based software development methods, processes, and tool chains for improved certification of flight-critical avionics software
Industrial Automation	Dr. Alois Zoitl	Software and Systems engineering methods/algorithms/tools for flexible adaptive production systems
Information Management & Services	Matthias Pfaff	Supporting SMEs on digital business models, IT strategies, best practice exchange, analysis of current ICT & ist potential, efficient provision of IT
Data and Sensor Fusion	Dr. Daniel Clarke	Integration architectures for sensor and data fusion algorithms with applications to autonomous systems
Software Engineering for the IoT	PD Dr. habil. Christian Prehofer	SW Tools, platforms and methodology for Internet of Things and Services
Human-Robot Interaction	Dr. Markus Rickert	Flexible robot systems, intuitive programming concepts, problem-related task descriptions, cooperation of human and robot
Machine Learning	Prof. Patrick van der Smagt	Machine learning for sensor and movement representation
Performance Management	Andreas Brunnert	Performance management of business applications, covering the complete lifecycle
Public Information Management	Dr. Marcus Dapp	IT controlling, ICT strategy, enterprise architecture management, E-government project management, open data
Systems Engineering Methods	Dr. habil. Bernhard Schätz, Dr. Sebastian Voss Dr. Vincent Aravantinos	Provision of scalable engineering methods for complex, software-intensive systems - from initial requirements down to platform deployment

# MEMAP

## Multi Energie Management und Aggregations Plattform

Kurzdarstellung Verbundvorhaben im Rahmen der Forschungsförderung im 6. Energieforschungsprogramm des Bundesministeriums für Wirtschaft und Energie „Forschung für eine umweltschonende, zuverlässige und bezahlbare Energieversorgung“



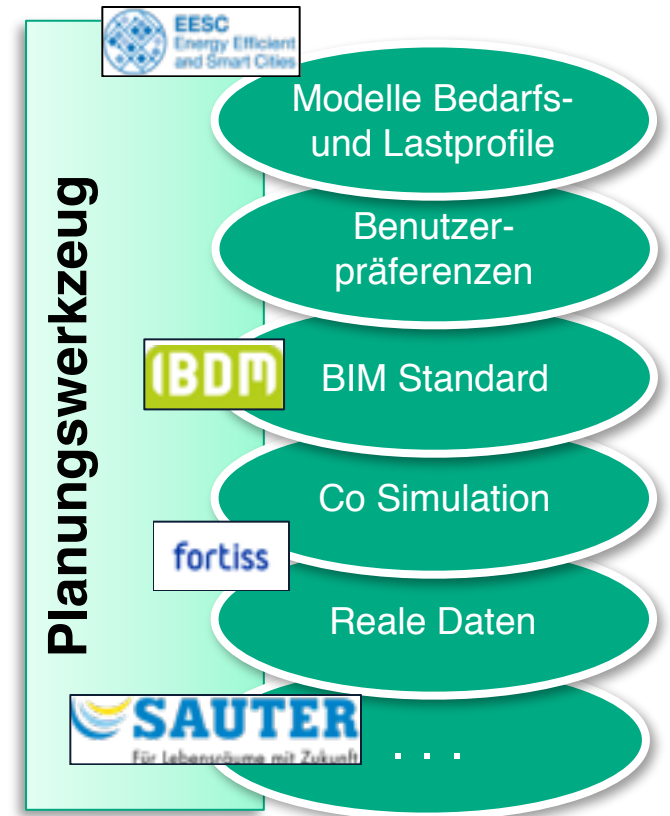
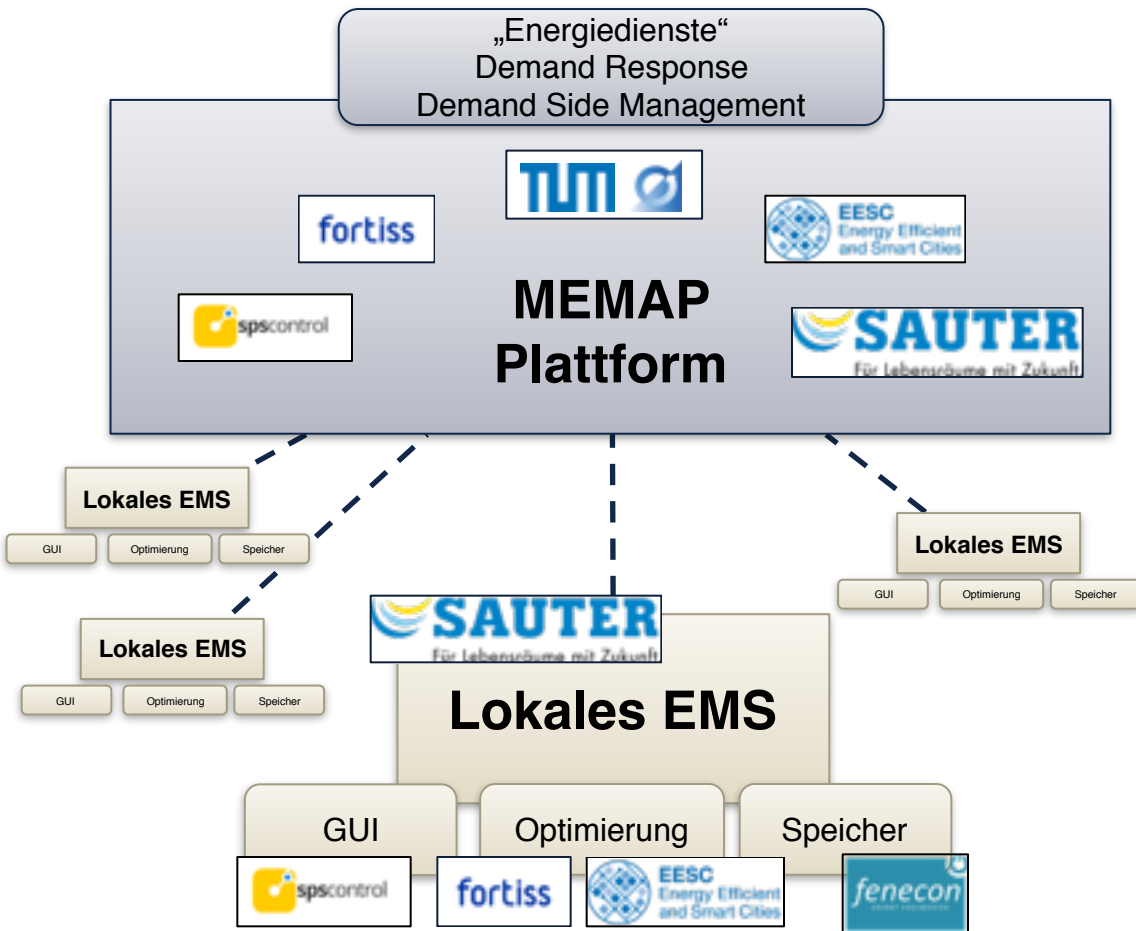
# Motivation

- *Ineffiziente Energieausnutzung*
  - über-/unterdimensionierte Anlagen
  - geringe Ausnutzung von Synergien (Energie/Wärme)
  - Synergieeffekte durch Kommunikation zwischen allen Nutzern der Energieverteilung und Energieerzeugung
- *Optimierung lokaler Anlagentechnik*
  - Kaum Berücksichtigung volatiler Energien
  - Trennung zwischen Planung und Betrieb
  - Pilotierung von Musterlösungen einer ganzheitlichen Energiebetrachtung
  - Gewerke-übergreifende Integration von Energiespeichern
- *Unterstützung der Endverbraucher durch intelligente HMI*
  - Bereitstellung einer intelligenten HMI
  - Energie Monitoring

# Ziele des MEMAP Vorhabens

- Entwicklung einer Aggregationsplattform zur Steuerung und Optimierung des lokalen Energieaustausches und zum Anbieten von Energiediensten
- Integration und Anbindung von Speichern und Erzeugeranlagen in lokale EMS, sowie die Entwicklung von geeigneten Steuerungsstrategien
- Integration von intelligenten Optimierungsverfahren in lokale EMS
- Entwicklung eines integralen offenen Planungswerkzeugs (unter Verwendung des BIM – Standard) zur energietechnischen Projektierung und der Simulation
- Beispielhafte Monitoringanwendungen und Benutzerschnittstellen zur Interaktion mit lokalen EMS
- Entwicklung und Analyse von Geschäftsmodellen für den lokalen Austausch von Energien
- Analyse und Bewertung des Nutzen einer Aggregationsplattform (auf Basis realer Daten)

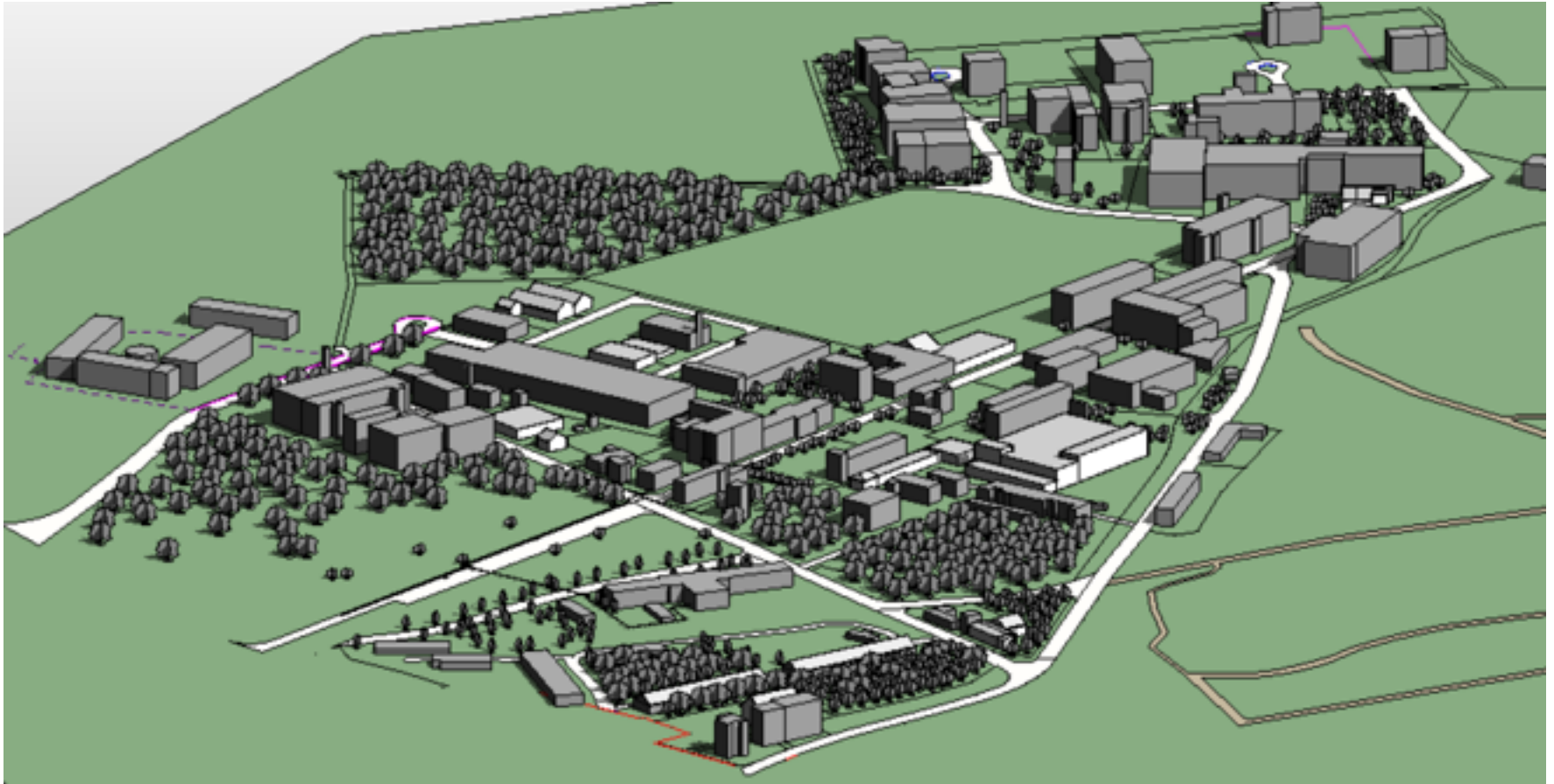
# Überblick MEMAP





# Beispiel Testgebiete

## Gewerbegebiet Hohenbrunn



Kontakt: Markus Duchon, Bernhard Schätz

**fortiss GmbH**

Guerickestraße 25 · 80805 München · Germany

**tel +49 89 3603522 28 fax +49 89 3603522 50**

[schaetz@fortiss.org](mailto:schaetz@fortiss.org)

[www.fortiss.org](http://www.fortiss.org)



# CPS Engineering Labs

## A Network of Design Centres

**Expediting and accelerating the realisation of  
trustworthy CPS**

[www.cpse-labs.eu](http://www.cpse-labs.eu)



Funded by the  
European Union

# CPS Engineering Labs - at a glance

- Objective: helping businesses develop trustworthy CPS
- Concept: businesses evaluate and adapt CPS design technologies in application development projects
- We provide funding for such fast-track, focussed “experiments” with specific innovation objectives
- Experiments are proposed by businesses and selected by us in an open competitive call process.



fortiss



# Open call process for experiments

Design centres provide CPS engineering platforms, knowledge and tools, e.g.

- CPS service engineering
- autonomous and cooperative systems, adaptive production systems
- collaborative development of hardware and software
- safety and security analysis
- smart objects for intelligent applications, smart user experience



## Call

- Design Centres offer topics for experiments in Open Calls

## Submission

- Businesses submit proposals for experiments

## Evaluation

- Proposals are evaluated by independent, external CPS experts

## Execution

- Selected experiments receive funding and are executed by businesses in cooperation with a Design Centre

# Innovation Experiments

Launch of  
next  
Open Call:  
**October 28**

Experiments are **innovation activities** that are:

- **Focussed**: run by single organization or a small consortium
- **Fast-track**: project duration can be 9 - 18 months
- **Funded**: 50k€ - 200k€ financial support (max. 150k€ per partner)
- Have **explicit objectives** that will clearly improve the business's ability to innovate

We have just started the first 6 experiments selected in 1<sup>st</sup> Open Call

Topics include developing demonstrators for

- Safe deployment of a mobile robot in an airfield runway for lighting maintenance
- Flexible development of an industrial control system for energy load management in a biogas plant
- Decentralised architecture for traffic management systems
- Testing framework for CPS tool chain integration

# Design Centre Spain

[www.cpse-labs.eu/spain.php](http://www.cpse-labs.eu/spain.php)

- Located in Madrid, operated jointly by the Technical University of Madrid (UPM) and Indra Sistemas.
- Focus topics are Internet of Things, geospatial and emerging technologies, RFID integration, cloud services, and **Smart Cities**.
- The Centre supports the “**SOFIA2**” IoT platform, which provides:
  - A middleware providing seamless interoperability between multiple devices and systems.
  - A semantic interoperability platform allowing the exchange of information from the real world between smart applications to build composed services.
  - An open source, multi-language and communications-agnostic approach.



# Smart City Topic in the current Open Call

The Spanish Design Centre invites businesses and city/urban area councils to propose innovative experiments in the Smart City domain that

- Integrate or improve existing Smart City technologies
- Define a specific innovative use case
- Develop prototypes for new products or services
- Are deployed in a real-world Smart City scenario

Experiments will be executed in close collaboration with the Spanish Design Centre, which will provide support in various ways, including:

- Technical assistance and coaching on the SOFIA2 platform
- Access to infrastructure, test-beds, and sensor networks
- Access to sensor network data

**More information about our call topics will be available at  
[www.cpse-labs.eu/calls.php](http://www.cpse-labs.eu/calls.php)**





Find more information about  
our Open Calls for Experiments  
at:

[www.cpse-labs.eu/  
calls.php](http://www.cpse-labs.eu/calls.php)

Contact:

Dr. Holger Pfeifer  
CPSE Labs coordinator  
fortiss, München  
[pfeifer@fortiss.org](mailto:pfeifer@fortiss.org)  
089 / 3603522-29

fortiss



Funded by the  
European Union