Fraunhofer Institute for Experimental Software Engineering IESE

Fraunhofer IESE was founded in 1996 as a spin-off from the University of Kaiserslautern's Department of Computer Science. Currently, more than 200 scientists perform research in software and systems engineering. With an annual budget of more than 14 million €, new competencies are developed in the context of pre-competitive research and are then transferred into industrial practice by means of contract research. Funding for pre-competitive research comes from public sources; contract research is done in cooperation with companies from all domains in which software is needed either in the product (e.g., for automotive controls) or for the efficient execution of business processes (e.g., financial service providers). IESE is one of 59 institutes of the Fraunhofer-Gesellschaft, which, as the largest European organization for applied research, contributes to Germany's competitiveness both nationally and internationally.

The competencies of Fraunhofer IESE include engineering-style methods and tools for developing certifiable software with specified quality characteristics according to budget and schedule as well as for the long-term sustainment of development know-how. Engineering-style approaches in software development are characterized by a formal mathematical basis, scalable processes, as well as empirically proven prediction models. Software architecture models for product families, operational inspection methods for software, approaches for the integrated modeling of instrumented process chains, and project management methods on the basis of empirically proven prediction models constitute key topics that the institute's scientists deal with in theory and practice.

Contract research performed at Fraunhofer IESE focuses on business areas in the context of "embedded systems" as well as "information systems". In embedded systems, the focus is on automobile and transportation systems as well as health and medical technology; in information systems, the focus is on support systems for financial service providers, eGovernment, and energy management.

Another area of growing importance is ambient systems. Ambient systems are embedded systems that independently explore their environment by means of micro-sensors, and that are capable of acting pro-actively and intelligently dependent on the situation at hand. In health care, Ambient Assisted Living (AAL) technologies are becoming increasingly important. With their help, elderly people are able to continue to live self-determined lives in their own homes despite impaired motor skills or sensory or cognitive deficits. Ambient systems also constitute a promising technology for minimizing the global demand for energy and are therefore the subject of far-reaching research at IESE.

Fraunhofer IESE is active on a global scale and in many international networks. The language used at the institute is English. IESE's international projects involve partners in Europe, North and South America, Asia, and Australia. Scientific contacts exist with leading university and industry groups worldwide. IESE is the coordinator for the largest network in the area of empirical software engineering, the International Software Engineering Research Network (ISERN). A sister institute of IESE with a staff of approx. 25 exists at the University of Maryland, USA. Other project groups exist in Brazil and Australia. Members of the IESE staff come from more than 20 countries. In international rankings, Fraunhofer IESE has held the top position in Europe for many years.

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Research Areas

- **Embedded Systems**
- **Process Management**
- **Information Systems**
- **Ambient Assisted Living**
- **Smart Energy**

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