PhD Program
   Graduiertenkolleg

Embedded Microsystems
   04/2005 – 09/2009

A Joint Program of the Institutes of
   Microsystem Technology IMTEK &
   Computer Science IIF
   of the Faculty of Applied Sciences
   at the University of Freiburg

Sponsored by
   German Science Foundation DFG
   ENDRESS & HAUSER
   MICRONAS AG
   SICK AG

URL
   http://www.imtek.de/ems


University of Freiburg IIF IMTEK

◆ Summary

In the research prospects 2000+ the Max Planck Association states: „In the future, numerous objects of our daily life will contain embedded microsystems with interfaces to people and wireless connection to other objects. This requires reliable, highly meshed systems that will exceed the dimension of what we know today from the World Wide Web" — Applications in medical diagnostics, instrumented homes, manufacturing enviroments, and vehicles among others demand a systematic development of methods for the design and the secure operation of such embedded microsystems as well as the education of highly qualified scientists in this area. The PhD program „Embedded Microsystems" at the University of Freiburg strives for this goal.

The Faculty of Applied Sciences at the University of Freiburg offers an ideal setting: the nationwide unique combination of the Institute for Computer Science IIF and the Institute for Microsystem Technology IMTEK. This constellation will lead to multiple synergies providing a fresh perspective on the intricate connection of software and hardware in miniaturized technical systems. The thirteen research fields of "Embedded Microsystems" investigate development and test methods for software and hardware under the demanding contraints imposed by microsystems and their environments.

The educational program crosses the traditional borderline between computer science and microsystem technology and offers a sound basis for the progression towards a PhD degree in embedded microsystems.
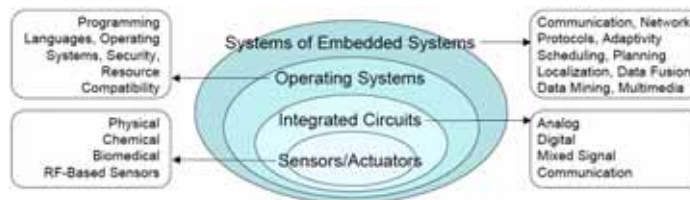
◆ Jobs

From April 2005 to September 2009, the PhD Program will involve up to

19 PhD students

financed by scholarships awarded for up to three years. The PhD students will form an interdisciplinary team working on the following topics

- Communication in embedded microsystems (main supervisor: Prof. S. Albers)
- Energy-efficient automation in distributed microsystems (Prof. C. Ament)
- Test methods for MEMS (Prof. B. Becker)
- Sensor data fusion for embedded microsystems (Prof. W. Burgard)
- Mixed-signal modelling and synthesis on FPAA and FPGA; Application specific microcontrollers (Prof. Y. Manoli)
- Self-diagnostics and self-calibration of embedded microsystems; Integrated magnetic sensor systems for localization (Prof. O. Paul)
- Miniaturized, robust, and highly precise local positioning systems; Microsystems with wireless communication (Prof. L. Reindl)
- Generation of minimal real-time operating systems for embedded microsystems (Prof. C. Scholl)
- Resource-aware program adaptation (Prof. P. Thiemann)
- Modular, decentralized, distributed microsystems for instrumentation applications (Prof. G. Urban)
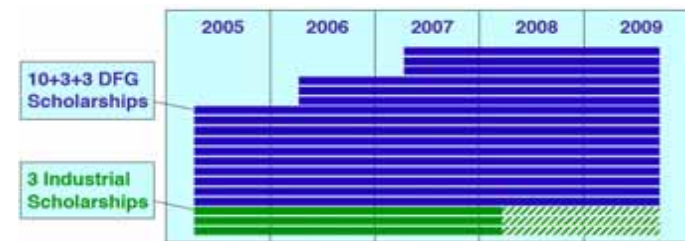
◆ Contacts

Program Chair

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◆ For Applicants

What we offer

- A hot topic of interdisciplinary character and high scientific and industrial relevance.
- Excellent technological, analytical, and computational infrastructure.
- An elaborate learning/teaching program combining the strengths of the two participating Institutes of Microsystem Technology IMTEK and of Computer Science IIS.
- Guidance by a team of two supervisors for each PhD student.
- Integration into the scientific and social network of IMTEK (ca. 200 members) and IIS (ca. 150 members).
- Opportunities to interact with guest lecturers and scientists and to spend part of your work in partner labs abroad.
- Complementary training activities by local small and medium enterprises
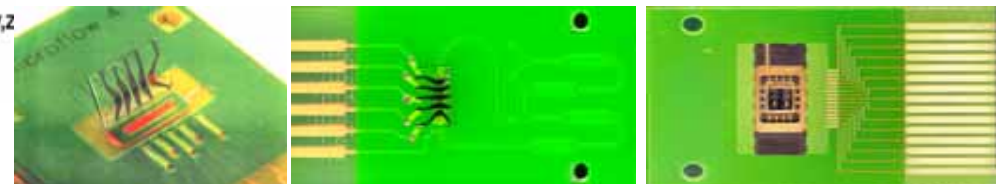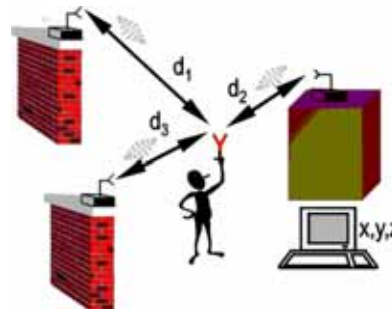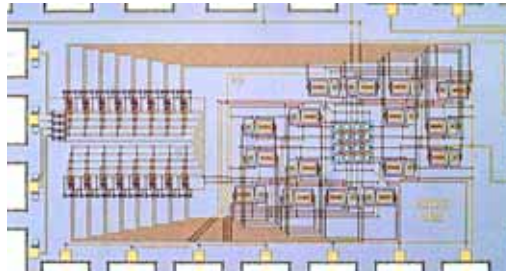
What we expect

For admission to the Graduate School, fulfillment of the general requirements of the PhD regulations of the Faculty of Applied Sciences is a prerequisite. In addition we expect:

- Exceptional achievements in your studies.
- Straightforward and fast completion of your studies.
- Age 28 at most (in agreement with DFG regulations).
- A convincing interview with potential PhD advisors of the PhD Program.

Once you are admitted to the PhD Program, we expect that you:

- Register with the Faculty of Applied Sciences as a PhD student (enabling you to apply for student healthcare insurance and other student benefits).
- Devote your full labor to the PhD Program.
- Attend the seminars and summer/winter schools of the PhD Program, including active participation and presentation.
- Proactively seek the communication and exchange of ideas with your fellow students and with your supervisors.
- Publish your results at conferences of your field of research and in the archival literature.

How you apply

Interested? Please check out the detailed application procedure on: **http://www.imtek.de/ems**