

Ambient Intelligence – Inventing the Future!

Ambient Intelligence represents a vision of the future where we move in electronic environments that are situation-sensitive and adaptive to user expectations. Ambient intelligence makes human needs the center of technology development.

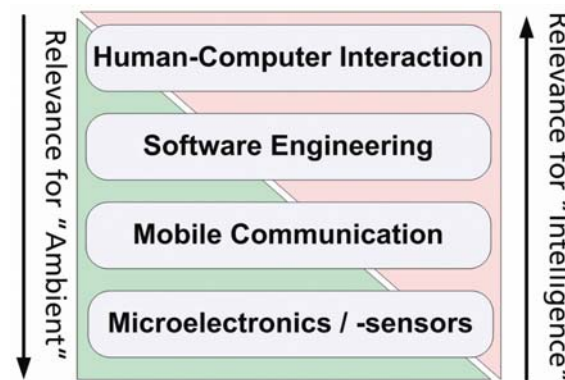
Ambient Intelligence systems, focusing on smart interaction of appliances with people and their seamless networking, will impact all aspects of life, ranging all the way from everyday situations to manufacturing applications:

- **Smart Traveling:** Your car navigation system exchanges information with your PDA such as your schedule and addresses and is able to propose a route to your destination, without your intervention.
- **Assisted Training:** By analyzing the body condition and performance of each cyclist in a team, the system suggests real-time adaptations to the training strategy. When a cyclist joins or leaves the team, the network is reconfiguring in an ad-hoc fashion.
- **Intelligent Manufacturing:** By integrating available diagnostic tools and camera/sensor technologies, information on machine control is presented to the engineer by Head-Mounted Displays in a context-specific manner.
- **Assisted Living:** Your grandma lives at home. Her home-care system monitors her medical state and checks whether she keeps to her daily routine, such as taking the necessary pills.

Integrating many Disciplines!

Ambient Intelligence systems must be aware of their context and the user's needs, and adapt their behavior to these constraints. They also team up to provide full service and blend with the environment to provide their services in the least intrusive manner possible.

Ambient Intelligence is a truly inter-disciplinary challenge and requires the cooperation of scientists from many different backgrounds, such as Microelectronics or Human-Computer Interaction.



The cooperation project **BelAml** (Bilateral German-Hungarian Research Collaboration on Ambient Intelligence Systems) is based on this assumption and – by integrating competencies from Hungary and Germany – aims at providing a comprehensive set of relevant Ambient Intelligence technologies. The project BelAml seeks to establish a bilateral competence center for Ambient Intelligence that effectively partners with industry and research organizations on a large scale.

The Background

The BelAml project brings together partners with a wide set of backgrounds, which is required for realizing Ambient Intelligence applications and services in domains as diverse as assisted living, e-health, smart car, or smart home.

Our research extends across the following relevant technology levels:

- **Human-Computer Interaction:** usability engineering for flexible systems, user modeling, adaptive interfaces, voice technologies, etc.
- **Software Engineering:** dynamically reconfigurable software architectures, quality management for flexible and dependable systems, resource optimized programming, etc.
- **Mobile Communication:** adaptive routing, ad-hoc networking, quality of service guarantees, security, localization services, etc.
- **Microelectronics / -sensors:** low-power systems and circuits, energy production, static and dynamic sensors, etc.

The development of Ambient Intelligence systems is a challenging task, demanding many different skills and technologies. Through an integrated effort, which links together research institutes and universities from Hungary and Germany, a **virtual competence center** has been created, which has a lot to offer to its partners from industry and academia.