



## Smart Objects & Ambient Intelligence October 12th - 14th 2005, Grenoble, FRANCE

### Invited speakers

Conference theme

Forewords

Invited speakers

Special sessions

Regular sessions

Program

Proceedings

Demos

Deadlines

Registration

Committees

Partners

Tools of  
communication

Access to WTC

Mailing list

Accommodations

Contacts

Archives

Emile AARTS - "Ambient Intelligence : Visualising the Future"  
(Philips Research Laboratories Eindhoven - The Netherlands)

Hans GELLERSEN - "Cooperative Systems of Physical Objects"  
(Computing Department at Lancaster University - UK)

Alex WAIBEL - "CHIL Computing to Overcome Techno-Clutter"  
(Carnegie Mellon University, Pittsburgh and University of Karlsruhe - Germany)

### Emile AARTS ↑



Prof.dr. Emile Aarts is Vice President and Scientific Program Manager at the Philips Research Laboratories Eindhoven, The Netherlands. He holds a MSc. and PhD. degree in physics. For almost twenty years he has been active as a research scientist in computing science. He holds a teaching position at the Eindhoven University of Technology as a part-time professor of computing science. He also serves on several scientific and governmental advisory boards. He holds a position of senior consultant with the Center for Quantitative Methods at Eindhoven University of Technology, The Netherlands. Emile Aarts is the author of fifty more than hundred and forty scientific papers on a diversity of topics including nuclear physics, VLSI design, combinatorial optimization, neural networks. In 1998 he launched the concept of Ambient Intelligence and in 2001 he founded Philips' HomeLab. His current research interests include embedded systems and interaction technology.

### Abstract of the intervention : "Ambient Intelligence : Visualising the Future"

Ambient Intelligence systems are aimed at making usersystem interaction and consumption a truly positive experience. The endless search for nifty information visualization mechanisms to squeeze yet one more piece of information onto a visual display is the challenge to embed interactive displays into our environments that bring true user experience. Examples of experiences supported by immersiveness, social intelligence and freedom have been investigated in the Philips HomeLab. HomeLab offers a unique environment for evaluating the feasibility and usability of technologies that are used in the realisation of Ambient Intelligent scenarios. Equipped with an extensive observational infrastructure of 34 cameras and microphones, the HomeLab has enabled behavior researchers to study the effect of innovative technologies on the user's acceptance of Ambient Intelligence. In the presentation we discuss recent developments resulting from our work at HomeLab with an emphasis on the relation between (information) visualization and user experience.

**Download the PDF presentation :** presentation n°2000 (released soon)

---

**Hans GELLERSEN** ↑

Hans Gellersen is a professor of interactive systems in the Department at Lancaster University. His research interest is in computing and embedded interactive systems. This spans enabling technologies such as position and context sensing, interfaces beyond the desktop, and embedding of intelligent everyday artefacts. Hans has led a number of European projects on these topics, and he is a principal investigator in major projects including the Equator project in the UK. He is participating in the Ubiquitous Computing research community, founded the HCI conference series, and recently served as program co-chair in 2005.

Hans has been a full professor at Lancaster since 2001. Prior to that he was a researcher at the University of Karlsruhe. He holds a PhD in Computer Science, both from Karlsruhe.

**Abstract of the intervention : "Cooperative Systems of Physical**

Notions of 'smart objects' often conjure up images of everyday items that begin to have a life of their own. In contrast, physical objects that are beginning to be integrated into computational infrastructures typically have little or no autonomy as compared to smart objects. They reside at the periphery of such systems, and may be able to locally interact through sensors and actuators while being reliant on backend infrastructure to process information, observe and to decide what is actuated. In this talk we consider systems of physical objects that are more autonomous and independent of infrastructure but no less focussed on their deployment and application. The systems we think of are decentralized (all computation is embedded in the physical objects), highly contextualized (physical objects have a specific role and affordance), and variable in configuration (resulting from physical use and motion of objects). The individual objects in such systems are naturally limited in the extent to which they can interact with the world : how they are manipulated and configured is dependent on their physical afford and support, and what they sense and affect is inherently local. The challenge we explore is how physical objects can form cooperative systems capable of complex interactions with their environment. The specific challenges we consider include how objects can cooperate to model activity and assess situations in their environment, how objects can establish their spatial configuration through cooperative sensing, and how we may design interfaces that exploit ad hoc composition of physical interface components.

**Download the PDF presentation :** presentation n°2002

---

**Alex WAIBEL** ↑

Alex Waibel is a Professor of Computer Science at Carnegie Mellon University, Pittsburgh and at the University of Karlsruhe (Germany). He directs the Interactive Systems Laboratories ([www.is.cs.cmu.edu](http://www.is.cs.cmu.edu)). His research focuses on human-computer interaction at the intersection of several Universities with research emphasis in speech recognition, natural language processing, language recognition, language processing, speech translation, machine learning, and human-computer interaction.





and multimodal and multimedia interfaces. At Carnegie Mellon serves as Associate Director of the Language Technology II Director of the Language Technology PhD program. He was founding member of the CMU's Human Computer Interaction (HCI) and continues on its core faculty. Dr. Waibel was one founders of C-STAR, the international consortium for speech research and served as its chairman from 1998-2000. His developed the JANUS speech translation system, the JANUS recognition toolkit, and a number of multimodal systems including Genoa Meeting recognizer and meeting browser.

### **Abstract of the intervention : "CHIL Computing to Overcome Te Clutter"**

After building computers that paid no intention to communicating with humans, we recent years developed ever more sophisticated interfaces that put the "human in computers. These interfaces have improved usability by providing more appealing (graphics, animations), more easy to use input methods (mouse, pointing, clicking and more natural interaction modes (speech, vision, gesture, etc.). Yet the products have been promised have largely not been seen and human-machine interaction is partially frustrating and tedious experience, full of technoclutter and excessive attention by the technical artifact.

In this talk, I will argue, that we must transition to a third paradigm of computer use let people interact with people, and move the machine into the background to observe humans' activities and to provide services implicitly, that is, -to the extent possible explicit request. Putting the "Computer in the Human Interaction Loop" (CHIL), in other way round, however, brings formidable technical challenges. The machine must always observe and understand humans, model their activities, their interaction with humans, the human state as well as the state of the space they are in, and finally, intentions and needs. From a perceptual user interface point of view, we must move from sensors that are always on, frequently inappropriately positioned, and subject to greater variability. We must also not only recognize WHAT was seen or said in a given context but also a broad range of additional information, such as the WHO, WHERE, HOW, WHY, WHEN of human interaction and engagement.

In this talk, I will describe a variety of multimodal interface technologies that we have to answer these questions and some preliminary CHIL type services that take advantage of perceptual interfaces.

**Download the PDF presentation :** presentation n°2001