

Call for Participation for the

3rd Workshop on Object Technology for Ambient Intelligence (OT4AmI)

Location: Berlin, Germany
Home page: <http://sam.iai.uni-bonn.de/ot4ami2007>
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Important Dates

Submission of papers: May 13, 2007
Final version of papers: June 22, 2007
Notification of acceptance: May 31, 2007
Workshop takes place: July 30, 2007

Motivation

In the near future computing technology will be embedded in all kinds of physical objects. These objects can become aware of their physical environment by communicating with other objects in their surroundings. A new level of dynamicity will be required in order to construct software that can leverage on this novel hardware constellation. This kind of software has been given different names like Ambient Intelligence (AmI), Pervasive Computing or Ubiquitous Computing with slightly different meanings. We use the term Ambient Intelligence but address equally all kinds of mobile, distributed software from the software engineering point of view.

The idea of Ambient Intelligence is that everybody will be surrounded by a dynamically-defined processor cloud, of which the applications are expected to cooperate smoothly. This vision puts new challenges on the software that is embedded in these physical objects. For example, software is highly context-dependent due to the continuous changes in physical surroundings as a result of the mobility of both the software and the hardware. The software needs to cope with wireless communication links between physical objects can break at any point in time, etc...

Currently, Ambient Intelligence seems to incorporate aspects from previously "unrelated" fields such as ubiquitous computing, mobility, intelligent user interaction, context dependency, domotics, autonomic computing etc. Early experiments in these fields, as conducted for example by Philips, IBM or at the MIT, already indicate that a full realization of their potential will need a new generation of concepts. These concepts need to support software which is able to operate in extremely dynamic hardware and software configurations.

Ambient Intelligence is put forward as one of the major strategic research themes by the EU's IST Advisory Group for the financing structure of the 6th Framework of the EU. "*The focus of IST in FP6 is on the future generation of technologies in which computers and networks will be integrated into the everyday environment [...]. This vision of 'ambient intelligence' places the user, the individual, at the centre of future developments for an inclusive knowledge-based society for all.*" (from the overall vision of the working programme of IST in FP6)

Goals

Important goals of the workshop are to identify and discuss the impact of Ambient Intelligence on object-oriented technologies and vice versa, and to outline some fruitful paths for future research into the connection between Ambient Intelligence and object-oriented programming languages and systems. In this context, we understand the term "object technology" to cover the whole range of topics that have evolved around the notion of object orientation in the past decades, starting from programming language design and implementation, ranging over software architectures, frameworks and components, up to design approaches and software development processes.

As in previous editions, we expect a special emphasis on the (seemingly?) conflicting forces of high dynamicity as offered, for example, by delegation- and reflection-based object-oriented systems that provide a high level of adaptability on the one hand, and people's needs for security, safety and stability on the other hand. Also, this year we particularly welcome contributions in non-conventional programming paradigms, such as biologically-inspired computing and emergent behavior, as well as in human-system interaction.

Topics

Potential topics include, but are not limited to:

- **Programming Models:** Concepts for coping with new levels of dynamicity and security, advanced modularization mechanisms, impact of the specificities of small mobile equipments on the software in terms of object-oriented concepts.
- **Reflection:** Why could it be interesting to devise advanced reflective virtual machines? What about security and reflection?
- **Security issues:** Network security problems, keyboard manipulations, specific attacks (for example heat attacks, hardware manipulations, exploitation of SMS and MMS), impacts on the software infrastructure. Security policies: How to bridge the gap between (too) low-level and (too) high-level rules? How to take structural constraints into account?
- **Software Adaptation:** Mobile software must continually adapt itself to potentially unanticipated environments. How can this be tackled?
- **Context Modelling:** What are the most promising ways to model context and integrate it into the software architecture?
- **Biologically-Inspired Concepts:** Biological systems are very robust and adapt very well to their context. Robustness and adaptivity are at the very core of the demands in Ambient Intelligence. By borrowing concepts from such systems can we find new ways create software that is robust and adaptive to a large extent?
- **Software Engineering for Autonomous Systems:** Currently we see a large gap between programming autonomous system (or even experimenting with emergent behaviour) on the one hand and the development methods for mobile context-sensitive software. More generally, are the current approaches to analysis, modelling and development able to cope with the specific demands of mobile software?
- **Device-Device and Human-System Interaction:** What are the requirements for embedded virtual machines? How do the existing models (Java, Smalltalk, Scheme, Python) differ from each other in handling events and communicating with people and other devices? Do they enable the software to exploit spontaneous collaborations between multiple devices and people?

Format

We strive for a high level of interaction among organizers and participants at all stages of the workshop. Therefore, we encourage you to submit either **position papers** (i.e. authors should postulate a position on 2-6 pages (LNCS style), not just small technical papers) or a **survey of the state of the art** (identifying weaknesses and opportunities).

Some of the most controversial and innovative ideas will be selected for presentation and discussion. In the afternoon workshop participants will be invited to propose topics for further discussion, after which a number of small (4-6 people) breakout groups will be formed to further discuss these topics. At the end of the workshop, people from each group will present the conclusions of the discussions to all participants.

The format is quite different from the two previous editions of OT4Aml because we want to provoke more discussion outside the focus of each participant's technical setting. Based on our experiences with other workshops we believe this format will contribute achieving that goal.

We will produce a workshop report in collaboration with the participants, in order to extract and express the most important insights.

Submission Guidelines

Potential attendants are expected to submit a position paper of 2-6 pages (LNCS format) that presents a possible approach towards combining object-oriented technology and ambient intelligence. Papers defend a statement about how the authors envision that software for Ambient Intelligence should be build, wish lists of features that future approaches should provide but are currently hard to achieve with the state of the art. A good analysis of conflicting forces is at least as useful for potential participants of this workshop as descriptions of original new approaches.

You find details about submission in the web at <http://sam.iai.uni-bonn.de/ot4ami2007/submission>.