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Computers are becoming more and more ubiquitous, moving from the desktop into the infrastructure of our everyday life. They begin to augment and influence the way we interact with our personal environment – the (physical) entities that we operate upon in order to achieve our daily goals. Intelligent appliances, electronic assistance for environments and usage situations, future human-computer interaction – »Beyond the Desktop« – these are main research issues now and in the future.

With this issue of CG topics we strive to give you an overview of ongoing activities at the INI-GraphicsNet in the above mentioned areas which can be summarized by »Intelligent Interactive Assistance and Mobile Multimedia Computing«.

One key topic of this issue is the »Telebuddy« project which will be presented at the EXPO 2000 World Exhibition at Hannover, Germany for the first time world wide. With the Telebuddy device, we provide a visible artificial body – a physical avatar – for the Internet community, functioning as its eyes, ears and mouth. Like a »buddy«, it can accompany a person at visits to exhibitions or interesting locations, and it can communicate with its »biological« partner about the shared experience. The Telebuddy offers new ways of information presentation and interactive communication, going far beyond existing mobile web-cams and Internet chat systems. This project shows new ways of mobile multimedia computing, ways that let technology vanish into the background and help the user to concentrate on what he wants to do.

Another important section strongly involving members of the INI-GraphicsNet are projects focussing on »Human-Technology-Interaction«. Several articles cover this field and three projects will be presented: »MAP – Multimedia Workplace of the Future«, »ARVIKA – Augmented Reality for Development, Production and Service«, and »EMBASSI – The Electronic Multimedia Operating and Service Assistant«.

»MAP – Multimedia Workplace of the Future«, a project involving 14 partners and going on for three years, addresses the development of a kernel-system which includes the support of agent technology, new human-computer interaction mechanisms, the integration of security mechanisms, and the support of mobile devices and context-aware working. The results of the MAP project will allow industries to use resources efficiently and therefore enhancing productivity, especially when done on the move. The results will further be the base for a new standard of mobile multimedia workplaces.

»ARVIKA – Augmented Reality for Development, Production and Service« uses augmented reality (AR) technologies to investigate and create a user-oriented and system-driven support of operation procedures. It focuses on development, production, and service of complex technical products and systems. Augmented-Reality technologies will improve working environments by merging real objects with computer-generated virtual objects to generate detailed engineering and processing instructions.

»EMBASSI – The Electronic Multimedia Operating and Service Assistant« was described in detail in issue 01/2000 of CG topics. The article in this issue will focus on the use of agent technology in the EMBASSI system, especially the development of resource management functionality. With this development EMBASSI will allow genuine intelligent interactive assistance and is a big step towards context-aware systems.

The article »Beyond the Desktop: Natural Interaction and Intelligent Assistance« outlines the beginning fundamental paradigm shift introduced when switching from a stationary computer with its own virtual world to a personal, ubiquitous information appliance: These devices are able to operate as mediators between a user and his physical environment, helping the user to interact with reality. Challenges are created both at the level of human-computer interaction as well as on the level of situation-aware computing. The article specifically concentrates on our work on intelligent, situation-aware assistance for personal appliances. The realization and use of situation awareness is outlined by introducing a personal navigation application.

The next article presents a complementary and very important issue in this field: the topic of usability. Usability aspects for interactive assistance and mobile applications are an area which clearly has a large influence on the above mentioned projects and many of our activities are directed on usability aspects for interactive assistance and mobile applications. The article »HCI Development:

Beyond the Desktop« reports our activity in the HCI community to define future research directions. The main topics defined by ZGDV and GRIS are social aware and anthropomorphic systems, the implications of ubiquity beyond the desktop in roles, models and relationships, and information appliance design: known questions – new answers. This article shows that human-computer interaction will have an even stronger impact when trying to realize mobile and interactive assistant systems.

Situation-aware computing of course requires the computer to be able to sense the current situation – at least the location. The article »You Are Here« presents a low-cost beacon-based location sensing technology which is usable with virtually every ultraportable computer on the market – making these applications available to all owners of mobile computers. Especially indoor navigation systems can be created very efficiently using this beacon technology.

In the area of mobile information systems, the new standard WAP (Wireless Application Protocol) offers new possibilities for establishing hypertext-based services on ultra-portable devices such as cellular phones and PDA. Real interactive services which could not yet be offered, are enabled by this technology. This topic is addressed in the article »WAP-based Online-Brokerage with Mobile Devices« which illustrates one of our manifold activities in this field.

Concerning mobile multimedia computing, the integration and use of video based services is a key issue. The introduction of

GPRS and 3rd generation cellular networks, UMTS, with higher bandwidth and new aspects of network integration – from home-based networks to wide-area coverage – will allow the use of new media types, e.g. video. With the article »Video Interaction and Information Personalization for New Interactive Broadcast Services« we introduce new methods for the handling of and interaction with video data. This goes far beyond the established passive consuming of video, e.g. TV, and shows how video can be used to offer added-value services for the user.

Finally, we want to point to two interesting workshops organized by different members of the INI-GraphicsNet. Inside this issue you will find the call for participation for the workshop »Digital Storytelling«.

Furthermore, we have included the Call for Paper for the international workshop on Intelligent Interactive Assistance and Mobile Multimedia Computing (IMC2000). This workshop, jointly organized by the research group MoVi (Mobile Visualization) and the focus project EMBASSI, will provide an interactive forum for presenting and discussing current approaches to intelligent and interactive multimedia computing beyond the desktop.

We hope that we can give you an interesting and broad overview on our activities in the areas of interactive assistance, mobile multimedia and human-centered development. If you have any further questions or need more information, please do not hesitate to contact the editors or the points of contact listed at the end of each article.