

Open Wearable Computing Framework, Infrastructure and Standardization

TZI, Technisches Zentrum Informatik, Universität Bremen

Within the WearIT@Work project several wearable computing scenarios were developed and evaluated. One of the long hand goals was the definition, design and implementation of an Open Wearable Computing Framework (OWCF), which at this time still needs standardization and consolidation.

This project provides a cost-effective OWCF platform, infrastructure and standardization for wearable computing, which may attract the interest and consensus of major players in the field of development of wearable applications and telecommunication industry.

The OWCF framework, which is designed and developed in this project, works like a middleware and a software infrastructure that supports the construction (or operation) of other software, i.e. the wearable applications, or, in the scope of wearIT@work, the pilot applications.

OWCF will work is a software layer, which enables wearable applications built on top of it, to seamlessly take advantage of its functionalities/capabilities. The main reasons for having such a layer are:

- simplify the development of wearable applications
- encourage reuse of software components across different applications
- promote better software engineering practices

The OWCF will outlast some demonstrators developed in the project. Potentially it will also outlast further projects like wearIT@work, in order of laying a solid foundation for an effective framework (i.e. a software infrastructure in the sense sketched above). It will be able to demonstrate its usefulness, then maintenance and further developments of such a framework, wich may become major activities for a wider community that could be embodied in the envisioned Open Wearable Computing Group (OWCG).

Partner Description

The Center for Computing Technologies (TZI www.tzi.de) is part of the University of Bremen. It is dedicated to application-oriented research and development in computer science. Founded in 1995, its goals are the application and transfer of new scientific results into industrial practice, the development of innovative application-oriented technologies, and application-oriented training. In 2000 the TZI initiated the **wearLab**, which bundles all related research and institutional efforts to serve as a single point of entry to the area of wearable and mobile computing technologies. TZI was main contractor of the **WearIT@Work** project.

Since 2004 this work was enhanced by the **Mobile Research Centre** (www.mrcbremen.de) and a Test & Demo Centre with an infrastructure to perform usability studies there.

- Main interest within the project

Within the project TZI is interested about context detection, usability, sensor interpretation, wearable interface design, Open Interfaces and tool Integration.

- Relevant previous experience

Wearable computer, graphics, sensor fusion, and mobile communication was a main goal in projects like the EC IP wearIT@work (IP004216) and the national project KATO for aircraft cabin maintenance. Those projects provided 3D geometric information regarding infrastructure on low cost mobile phones and PDAs and Augmented Reality (AR) displays. Data Conversion and Processing is done XML-

based between content management and Collaboration/ Communication system components. Within the CHRONIOUS project TZI is responsible for context detection and model based sensor fusion in order to recognize the patient situations. Results are communicated via wireless networks.

Short CV's

Prof. Dr. Gerrit Kalkbrenner is working in the field of mobile media, multimedia, broadband network communication, and mobile communication now for 15 years. 1996 he finished his Dr.-Ing thesis in the field of Teleservices and E-Learning. With several projects (Multimedia Home Platform, E-Learning modules / virtual laboratories, Campus Mobil, Ubiquitous Media, Self Organizing Traffic System) he is concerned with Mobile Media. He played for instance a central role in the development of an open source Multimedia Home Platform.

Prof. Dr. Michael Lawo is with TZI at the Universität Bremen since 2004 as the Technical Manager of the IP 2004-004216 wearIT@work after being the CEO of a group of SME in the IT domain since 1999 with a focus on the development and marketing of virtual reality simulators for surgeons; from 1996 to 2000 he was CEO of an IT consulting firm which now belongs to UNILOG S.A./Paris and from 1991 to 1995 top manager information systems with the Bremer Vulkan group. Michael Lawo was consultant before joining the nuclear research centre in Karlsruhe from 1987 to 1991 as head of the industrial robotics department. He is a 1975 graduate of structural engineering of Ruhr Universität Bochum, received his PhD from Universität Essen in 1981 and became professor in structural optimisation there in 1992. In 2000 he was appointed as professor of honour of the Harbin/China College of Administration & Management. In 2006 he became the state doctorate at the University of Bremen for Applied Computer Science.