

### Editorial

The aim of this newsletter is to inform scientists, industry as well as older people in general about the achievements reached within the HERMES project. The newsletter appears approximately two times per year.

In this newsletter:

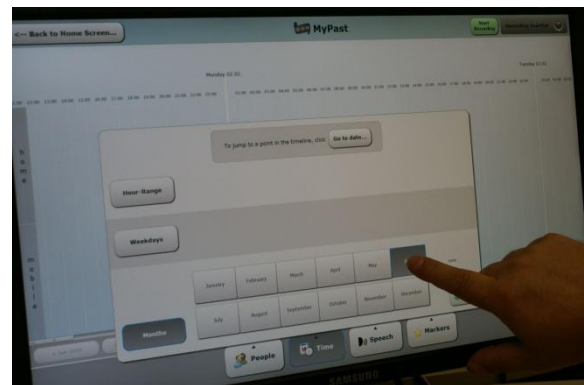
- Second Review Meeting in Brussels
- HERMES will be presented at AAL Forum 2010
- HERMES will be presented at ICT 2010
- AMI Workshop “Designing Ambient Interactions - Pervasive Ergonomic Interfaces for Ageing Well” based on HERMES results
- Results of the first HERMES field trials
- The User Interface of the second HERMES Prototype
- Audio and Visual Processing Components in the second Hermes Prototype
- Field Trials for the second HERMES Prototype will start shortly

Please do forward this newsletter to people that might be interested in the project! For more information on the project, take a look at the project website at <http://www.fp7-hermes.eu>.

Kind regards and enjoy reading!

Arjan Geven

*On behalf of the HERMES Consortium*



### Second Review Meeting in Brussels

On the 27th of April 2010 the second review meeting for the HERMES project by the European Commission took place in Brussels. The actual state of affairs and the further achievements have been presented to the reviewers. The main achievements in the second year can be summarized as follows:

- Integration of low-level components, metadata generation and post-processing components, and user interfaces for home and portable devices was accomplished
- The integrated first prototype was tested for all individual components according to the pre-defined testing plan. The project achieved good technological results,

especially with regard to the video and audio processing components, application design and implementation of envisioned scenarios, and cognitive exercises. The project accomplished the elicitation and retrieval of valuable feedback for development in further iterations of the system

- Content and context acquisition, i.e., audio, video and image processing components, and tracking systems have been redesigned and improved

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## HERMES will be presented at AAL Forum 2010

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The Ambient Assisted Living Forum 2010 in Odense, Denmark will take place from September 15-17<sup>th</sup> and will concentrate on innovative solutions for the elderly in order to foster independent living. The HERMES project will be represented in a session dealing with user involvement through innovation development. In an interactive carousel session

an overview about the HERMES project will be given and user involvement methods such as cultural probes or focus groups discussed. In this presentation we will show how a multimodal approach is used to enhance development of innovative solutions linked with user engagement as part of the HERMES project.

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## HERMES will be presented at ICT 2010

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HERMES is represented at ICT 2010, September 27 to 29 2010, in Brussels with an own exhibition stand. ICT is the major event for European research in information and communication technologies.

ICT 2010 comprises a "Conference" part, including sessions on various topics and guest speakers from science and practice, as well as an "Exhibition" part, including presentations by a number of selected European research projects. As HERMES is one of these, we will present the

actual HERMES system. Everyone has the opportunity to try out the second prototype and to inform themselves about the progress of the project in general. Due to the character of such an event it is not possible to install the technical equipment completely, e.g. some cameras and microphones will be missing. So the functionality of some components may be affected but the user interface is totally accessible.

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## AMI Workshop "Designing Ambient Interactions - Pervasive Ergonomic Interfaces for Ageing Well" based on HERMES results

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The AmI Workshop on 10<sup>th</sup> November 2010 workshop titled "Designing Ambient Interactions - Pervasive Ergonomic Interfaces for Ageing Well", will address the large number of emerging ergonomic and ambient interfaces that facilitate elderly inclusion and accessibility in the digital society. A large number of such interfaces and related interaction techniques (e.g., computing surfaces, voice/speech interfaces, haptics, multi-modal interfaces, context-aware interfaces, location-based interaction mechanisms) have been recently penetrating the AAL field in a number of application domain including home care, cognitive rehabilitation, social networking and

interaction, experiences sharing. From a technical viewpoint the above interfaces and interaction disciplines are based on a number of emerging technologies that fall in the broader range of pervasive computing and ambient intelligence. The aim of the workshop will be to explore all aspects associated with the design, development, deployment, use and evaluation of the above-mentioned interfaces. As a result, it will cover the whole lifecycle associated with leading edge interfaces and associated interactions.

## Results of the first HERMES field trials

In order to gain insights about the acceptance and usability problems of the HERMES system the first prototype has been evaluated under inclusion of 32 participants. The tested components are the *MyPast* and *MyFuture* applications on the home-based touch screen terminal, the *PDA* application on a PDA (which users were allowed to take home in order to facilitate longer interactions), and the *Cognitive Games*.

While HERMES is generally accepted by the users, detailed feedback was gained for the development of the 2<sup>nd</sup> HERMES prototype. Most of the encountered problems can be solved with quite simple means, e.g. changing the labelling of buttons. Moreover, often one solution covers several problems. The first

prototype tried out several new concepts, like the analogue clock to set the time. Without performing a user evaluation no reliable feedback could have been collected about aspects of the system that perform well, and others that need to be changed or replaced. Overall it can be summarised that, while users had difficulties with the applications, they were interested in using them and saw the value such a system might have for their own life. Interestingly, which application in particular draw their attention varied greatly. While for some the *Calendar* would be of great use, others valued the mobility of the PDA. Those users, who are already suffering of slight decrease of memory capacity or have relatives or friends suffering of such impairments, found *MyPast* very useful.

## The User Interface of the second HERMES Prototype

Considering the results of the first field trials and the reviewer's report the user interfaces of the HERMES system have been revised. One major improvement based on user feedback is the enhancement of consistency in the interfaces of home and mobile applications, both in functionality and visual design. Besides, for unknown interaction widgets for elderly people, like scroll buttons and drag'n'drop functionality, more adequate solutions have been found.

Furthermore the main application for the home-based system integrating the several parts of HERMES was developed new. It presents itself to the user through a main application called the "home screen" that allows launching six applications:

- *MyPast* allows retrieving audio and video of events that happened in the past
- *Calendar* enables end users to organize their future appointments
- *Cognitive Games* offers different types of cognitive games

- *Location Reminders* offers management of location-based reminders for HERMES Mobile
- *People Browser* allows browsing of existing contacts
- *Shopping Lists* allows management of shopping lists to be used on HERMES Mobile

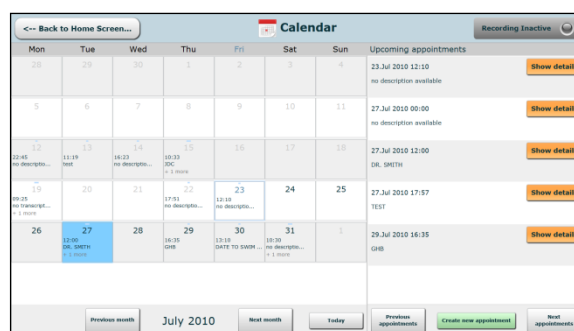
The interface offers colour-coded launch buttons for the individual applications and information on recent activities and upcoming appointments retrieved through *MyPast* and *Calendar* applications respectively. On the mobile platform the main application resembles the





launching bar of the home system. Of course, due to the unavailability of *MyPast* and *Cognitive Games* on the mobile platform, they are omitted. In exchange the conversation recording application is added.

Exemplarily for the evolution of the design the *Calendar* application can be regarded. The new design allows interacting with the application only on a hierarchical level, which simplifies interaction techniques and reduces cognitive load. This screen shows the actual date highlighted in a calendar view and at the time it also shows the next appointments starting with the day selected in a bar on the right.



The overall interface is rather simplistic for a maximum of overview. The navigation bar of the *Calendar* was moved from the top of the screen to the bottom to make it easier accessible for elderly users. For the same reason the colour settings have been adapted, too.

While all the other applications are completed the *MyPast* application for the home system is currently under final reconstruction.

## Audio and Visual Processing Components in the second Hermes Prototype

The components that form the back-end and feed the before-mentioned front-end applications are the backbone of the HERMES system. In comparison to the first prototype the second one improves existing technologies while other functions have been developed additionally. The following features are available:

- **Face Identification:** Identifies Actors entering HERMES space.
- **Visual Person Tracking:** Tracks people's movement within the HERMES space (in-door).
- **People counting:** Counts people within the room. This is a part of the person tracker.
- **Face Diarisation:** Builds up knowledge (in a semi-automatic way) about people using the HERMES system, without any need for training data.
- **Video summarization:** Long user videos are summarised to produce shorter versions that capture the most important frame sequences.
- **NMF-based clustering:** Users can be presented with semantically similar documents while browsing to facilitate memory triggering through human-like semantic document links.
- **NMF-based summarization:** Provides summaries of long transcripts summarising the most semantically important sentences.
- **NMF-based multi document summarization:** Provides multi-document summaries to describe general topics and themes in collections of documents.
- **Data logging and mining for reminder generation:** This is a top level component that logs the XMLs from perceptual components into the Common Data Structure and allows for retrieval with queries like person or event. It is also used for person and location specific reminders.
- **Audio speaker tracking:** Tracks speaker within the HERMES space (in-door).
- **Audio speaker recognition:** Recognises the speaker identity based on voice.

- **Multimodal person tracker:** Fuses visual and speaker trackers to improve localisation of the speaker.
- **Image/Video Tagging and Retrieval:** Stores images/video with appropriate tags. Retrieves video segments based on queries.
- **Voice activity detection:** Detects Human Speech to trigger recording.
- **Offline speech-to-text:** Transcription of spoken conversations (Spanish only) and transcription of spoken notes are available for display in textual form and for contents based search (on home system).
- **Speech Info indexing:** The speech transcripts are stored in indexed form for fast search.
- **Content based search in speech:** Returns relevant segments of audio in response to a textual query. Uses indexed speech info.
- **Text-to-speech:** Self explaining.
- **Situation ID:** Room occupancy, motion activity and time of day are used to reason about possible activities.
- **Improved offline speech analyser:** Built-in speaker tracker unit using a speaker identity tag in the output XML transcript.
- **Fingertips tracking for the multi-touch surface:** Track users' fingertips to enable multi-touch surface interface

### Field Trials for the second HERMES Prototype will start shortly

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After the reengineering of the first prototype based on the results of the first user trials, the final prototype trial will test the HERMES concept as a whole in terms of technology acceptance and effectiveness of memory support, the user experience, and the technical performance of the system within several scenarios. These trials will happen again with real users but this time in real environments.

The final prototype trials will be conducted in Austria and Spain with 24 persons in each country in a lab setting starting at beginning of October. In Spain additionally 8 persons will use a minimal system setup for 2-4 weeks in their home.

During the user evaluations our research focus is set to the following three elements:

- User perception of performance of the underlying components (Speed, Accuracy, Relevance)
- Usability and user experience of the user interfaces (Complexity, Learnability, Information visualisation)
- Effectiveness and acceptance of the HERMES concepts for cognitive support (Technology acceptance, Effectiveness of memory support)

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## About the HERMES Project

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“HERMES – Cognitive Care and Active Aging” is an international collaboration between six organizations in six countries, aimed at providing cognitive care to combat general cognitive decline induced by aging. The project is supported by the EU under Framework Programme 7 (Ref: 216709).

The project is conducted by the following six organizations:

1. CURE – Center for Usability Research and Engineering, Austria (Coordinator)
2. INGEMA Foundation, Spain
3. IBM Haifa Research Lab, Israel
4. University of Bradford, UK
5. Athens Information Technology, Greece
6. TXT e-Solutions, Italy

For more information about the HERMES project, contact the project administrator:

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