SEVENTH FRAMEWORK PROGRAMME
FP7-ICT-2009.7.2
Accessible and Inclusive ICT

Virtual and Augmented **E**nvironments and **R**ealistic User **I**nteractions **T**o achieve Embedded **A**ccessibility Design**S**
http://veritas-project.eu/

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Editorial

After almost one year of activities the VERITAS project has already achieved some of its milestones and successfully organised two events with external stakeholders as well as a meeting of the international Scientific Advisory Board and a reunion of the VUMS Cluster. All these events took place on 29th and 30th November in Prague, hosted by the Technical University of Prague.

The second issue of the VERITAS newsletter focuses on the 1st Pan-European User Forum and Worskhop. In addition, readers can find an interesting interview with a potential VERITAS beneficiary and a description of the multi-sensorial platform that the project is currently developing.

Each issue is available both in PDF and accessible HTML format via http://veritas-project.eu/category/newsletter/.

A newsletter about:

- Project events
- Current developments
- Upcoming events

Upcoming Events

5th European eAccessibility Forum
Benefits and costs of e-accessibility
28 March 2011,
Paris, France
Link to event website.

The European Future Technologies Conference and Exhibition
4-6 May 2011,
Budapest, Hungary
Link to event website.

1st Pan-European Users' and Beneficiaries' Forum

The VERITAS Users' and Beneficiaries' Forum which took place at the Czech Technical University of Prague on November 29th aimed at collecting feedbacks from the user groups targeted by the project: the developers/designers and the beneficiaries (older people and people with disabilities).

The event attended experts on disability and ageing issues, researchers, designers and developers interested in inclusive and accessible design of ICT and non-ICT products as well as project partners who were given the opportunity to interact with the users.

Manfred Dangelmaier (FhG IAO) gave a short overview of the project explaining its current phase and future plans. Nena Georgantzi (AGE Platform Europe) stressed the importance of user involvement and described how the project will include users, namely through virtual discussions on the website (via the virtual user forum) as well as future Fora that will afford to participants the opportunity to test the VERITAS tools. Eleni Chalkia (CERTH-ITI) presented the use cases and scenarios of VERITAS enabling participants to have a general view of what VERITAS will develop and how it will facilitate the design and development of products and services.

Following a request from the audience, Karel Van Isacker (MCA) clarified how the users' requirements were defined and how they will be validated throughout the project's lifetime. During the main part of the User Forum everyone had the opportunity to express their views on the prioritisation of the use cases as well as to point out any missing elements. During this discussion which was coordinated by Karel Van Isacker and Eleni Chalkia the partners received valuable comments on how to improve the existing scenarios.

Participants expressed their interest in participating in future events which will include demonstrations of prototypes and fruitful discussions on project developments.

The presentations of the User forum can be found in the VERITAS website: http://veritas-project.eu/2010/09/1st-pan-european-veritas-user-forum-and-workshop-to-take-place-on-28-29-november-2010-in-prague/

The next User Forum will coincide with the VERITAS workshop and will take place in autumn 2011.

1st VERITAS Workshop

On 30th of November 2010 the 1st VERITAS workshop took place at the premises of the Czech Technical University in Prague – Faculty of Electrical Engineering. The event was well attended and was a good opportunity to promote the VERITAS project and related topic to a wider audience in the Czech Republic. Mainly researchers both from academia and industry participated.

At the beginning of the event a welcome speech was given by the vice dean for research Prof. Zbynek Skvor. Then the project overview was presented by VERITAS coordinator Dr. Dangelmaier. Especially the goals of the project and the expected benefits were outlined. The technical project description was presented by Dr. Tzovaras from CERTH-ITI. The role of virtual reality in the design of user interfaces for handicapped users was explained and the structure of the project was presented. In the following section examples from developers, user requirements and benchmarking of existing tools that could be used in the project were presented and discussed. Examples of the VERITAS approach were given for the five specific application areas for which user interfaces should be created with support of tools developed in the VERITAS project.

The next workshop section was dedicated to models that will play an important role during the course of the project (task models, physical, psychological, behavioural and cognitive abstract user models). Next, use cases were presented and discussed.

Speakers from the VUMS cluster projects (GUIDE, VAALID, MyUI) gave information about their approaches used in their projects. Emphasis was on the synergies that are being established between these projects and the VERITAS project.

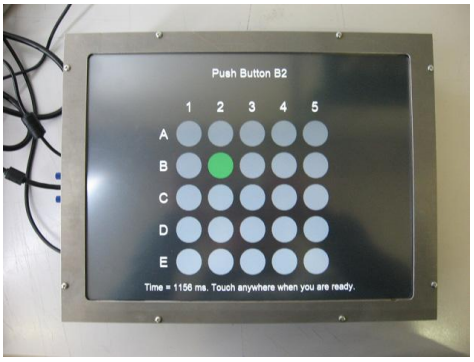
Finally, the ethical issues that all projects address were presented by the VUMS cluster. Especially the state of legislation in various countries was discussed together with the potential impact of national specifics for the investigations carried on in future research.

The closing speech and wrap-up was given by Dr. Dangelmaier.

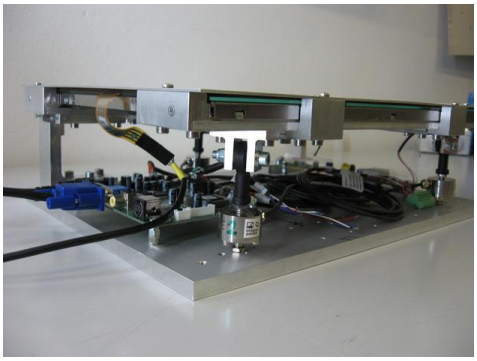
The VERITAS multi-sensorial platform

One of the main innovations in VERITAS in respect to virtual user modelling is the introduction and use of a multisensorial platform for the training of parameterized user models based on real user measurements in real testing conditions. The multisensorial platform is fully parameterized and adapted to the VERITAS application areas and will be used to capture user feedback while executing a number of tasks that will be mapped in the VERITAS virtual user models.

VERITAS aims to analyze and to create detailed virtual user models for some selected disability categories extracted by the International Classification of Functioning (ICF). Virtual user models are created taking into account:



Force Panel front view



Force Panel side view

a) The physical, cognitive, behavioural and psychological models.

b) The analysis of real user needs and wants.

c) The incorporation of guidelines, standards and methodologies.

d) The training with real users and the relative feedback through the multisensorial platform).

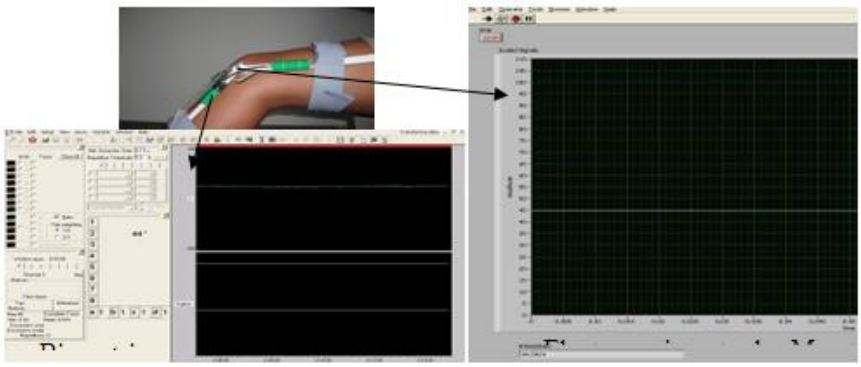
VERITAS multisensorial platform enhances the creation, validation and training of virtual user models through the participation and involvement of real users with disabilities within the VERITAS consortium. The platform allows evaluating the interaction of real users with the real environments, in terms of their physic response, to tune the virtual models and provide sufficient feedback for the quantitative evaluation and verification of the user models.

Ultimately the multisensorial platform provides the technological infrastructure for the capture of user motion in each of the application contexts. Indeed several systems are involved to constitute the whole platform. The main idea is to set up a system in which different sensors or motion capture system work together, with complementary role, to obtain the best result from observation and measurement of real subjects in the environments indicated by the project requirements:

Gait stances during a full walking cycle

VIDEO SENSING: it is a motion detection system based on three cameras positioned all around the subject to be observed. The operation of the system is based on an algorithm that uses both correlation method and optical flows method for motion detection. After a calibration needed to obtain intrinsic parameters (focal length, optical centre, distortion factor,...) and extrinsic parameters (rotation, translation) of the cameras, the system could obtain 3D information about the upper limb positions of seated subjects in the various environments (automotive cockpit, working places, etc.)

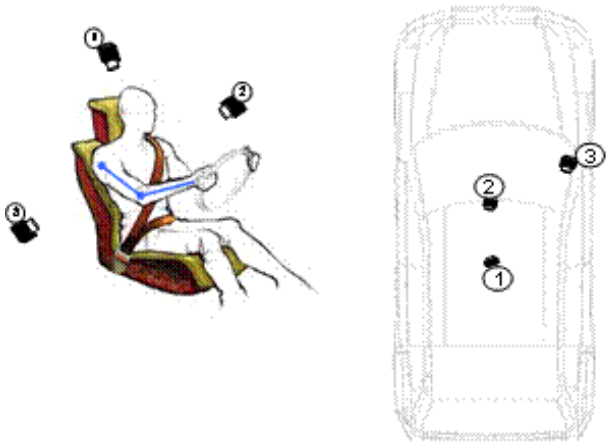
WEARABLE: this part of the multisensorial platform is constituted by a set of systems that can be used to collect data from movements of several parts of body or joints. At a first glance these systems could appear redundant to motion capture systems, but the request to do measurements in natural environments, justify their use especially when not ideal light condition or occlusion could create problems to motion capture operation. The set of system so far includes a sensing glove that exploits piezoresistive properties of its sensors and tactile sensors to recognize some static positions of the hand or grasps, an electrogoniometer based on a potentiometric encoder used to measure the angle of flexion-extension of the knee joint and one inertial platform system. This last is a commercial system, based on tri-axial accelerometers, able to measure several parameters in gait analysis like trunk and legs inclination, activity classification, step frequency/velocity. A garment motion capture system based on a suite with coloured markers allows the observation of the human posture while accomplishing the different tasks.



Signals from the electrogoniometer during test with biometrics system

MOTION TRAKING: this system it is being developed using commercial stereoscopic cameras (Bumblebee cameras). Main purpose is to analyze gait activity, identify specific irregular walking

patterns and to extract parameters like height, step and stride length and width, step asymmetries, cadence, body oscillation (width shift) during gait as well as hip, knee and hand range of motion.



Example of camera implementation (video system)

In order to obtain these parameters specific applications were developed: a capture application, in which are implemented also the necessary algorithms for the calibration of the cameras, records time-stamped images from cameras and the feature extraction application that uses the images captured (from the Capture Application) to remove the background and extract static 3D body information, as well as dynamic features during gait.

ENVIRONMENTAL SENSORS: this category of systems will be used to capture and analyze the user interaction with objects and interfaces in order to complement the vision given by the wearable sensors and cameras system. In order to observe the user interaction with respect to the environment will be used: Multi-axes load cell and a Force Panel.

The Multi-axes load cell will be used to estimate the force exerted by the user. The Force Panel, composed of a 15'' LCD system with a touch screen above and three force sensors below, instead is able to measure simultaneously the pinch force exerted by the user, the position and its precision, the reaction time. Furthermore interactive tests for cognitive aspects can be implemented. In order to have an evaluation of the reaction to the auditive stimuli coming from the environment a station for audiometric test (dB and frequency) will be included in the multisensorial platform.

A sensor network management architecture allows the sensors of the multisensorial platform to be integrated and to work properly in relation with a workflow scenario that could be defined by the user. This architecture is composed by different levels, from the workflow unit (responsible of workflow creation and scripting) and the sensor's management unit (synchronization of the data, workflow processor, data base, etc.) to the API relative to the single system of the multisensorial platform. Several applications have been developed in order to manage the different aspect of the sensor networks architecture (Multi-sensorial platform Management Application, the Recordings Client Unit Application and the Workflow Creator).

Interview with Mr. Wim Moeyaert

Wim Moeyaert (33) is from the organization "Werkgroep Vorming en Aktie" (WVA). This organization supports the integration, emancipation and inclusion of people with disabilities (children, youth, and adults with cognitive, mobility, visual or multiple impairments). They cover different domains: leisure time, formation, accessibility, policy, etc. People with disabilities are at the centre of its activities, and are also actively involved in the working of the organisation. Wim himself has Cerebral Palsy, with reduced mobility in the right side of the body, and also reduced vision. He is lately also using a wheelchair.

We met up with Wim at his office in Ypres (Belgium) where from he runs WVA. Having explained VERITAS, we discussed a wide range of topics where VERITAS would be really beneficial, focusing especially on the usage of the car.

Wim explains that as person with a disability, using the car might be a challenge sometimes. The special parking card does help him considerably because he can use designated parking spaces that (should) have more space next to his car for his wheelchair. The flexibility of how this card has to be renewed is another story altogether. In addition to the parking card, there is also the availability of such accessible parking spaces. According to Belgian law, 1 out of 25 parking spaces should be accessible. "But that is the law, not the reality. Furthermore, many of those dedicated parking spaces also do not meet minimum requirements. It looks like VERITAS could play a crucial role in this, that it can force architects to adjust parking designs so that make them accessible, following strict accessible building guidelines".

The biggest problem for Wim is actually getting his wheelchair in and out of the car. "My car (VW Polo) was bought before I was using a wheelchair, and now it also has to accommodate this extra "passenger", grins Wim". As you can see on the pictures with this article, the entire operation takes quite some effort from Wim. Automated systems exist, but are extremely expensive (8-10.000

euro). Support from the Flemish Agency for People with a Disability –if accepted- is also limited to 4.000 euro. In such automated cases, an electronic arm lifts the wheelchair and takes it onboard the vehicle, through a sliding door.

Wim did opt for a car with automatic gearing as this reduces the strains on his right arm (manufacturers do however not supply every model with automatic gearing, so choices are limited). "The availability default of a conductor chair that can be swung out and doors that open further than they normally do could also contribute to increased accessibility. Look at F1 driving. Noticed how the drivers can take of their steering wheels? Exactly that would also be useful for us as it is often a barrier to get in or out of the car, or when moving manually the wheelchair in the back of the car. Having the availability of sliding doors in the back would also be beneficial." "The car industry itself should consider such concerns at the very design process, thus addressing design for all", he continues. This would address not only the people with disabilities, but also the ageing population. After all, they will become a considerable group of people that will be eager to use their own car as well.

Wim is now in the process of having his car transformed so it can accommodate an electronic arm and other modifications.

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