

Project Results

Forging links between the real and the virtual

Standardised global framework enables interoperability between worlds in range of networked applications

The emergence of virtual worlds as a platform for networked services is an important enabler to reshape the way businesses and people interact with their environments. The Metaverse1 project developed a standardised global framework enabling interoperability between virtual worlds and the real world in terms of sensors and actuators, vision and rendering systems, and applications in social and welfare systems, banking, insurance, tourism and real estate. Results drove the ISO/IEC MPEG-V virtual worlds standard.

Virtual worlds are found in serious computer games and simulation models. However they are mostly stand alone and independent of each other with little or no connection to the real world. Metaverse1 set out to overcome this isolation – defining a standard to enable connectivity and interoperability between virtual worlds and with the real world.

The objective was to define interoperability in such a way that it would be possible to exchange information between worlds. For example personalisation of an avatar in one virtual world could be applied to an avatar in another world. This would be useful for example in translating social skills to supply feedback to users established in one coaching system to another virtual world for a similar application.

DEVELOPING A STANDARD INTERFACE

Even more important was the development of a standard interface between the real physical world and the virtual – simulation/serious games – world. This makes it possible to attach real world sensors, such as body parameter or environmental sensors, to provide input to simulations or alternatively obtain feedback from such models into the real world, for example to control lighting, temperature or ventilation or for personal wellbeing.

Another example is the use of 2D digital (video) sources as input for 3D worlds. Much of what is done today is already available in some kind of IT system. A standard interface makes it easy to obtain input from for example traffic reports, weather forecasts, property details or tourist information for virtual world representation or simulation.

OVERCOMING LIMITED CONNECTIVITY

Many of the technologies required were not new but it was necessary to identify what was missing and develop suitable solutions. Metaverse1 defined a series of use cases and then looked at what was available in terms of virtual worlds and the very limited connectivity with the real world – mainly through display screen, keyboard and mouse.

Some 18 missing items were defined and the necessary technologies developed.

METAVVERSE1 (ITEA 2 ~ 07016)

Partners

Alcatel-Lucent Bell
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Artefacto
Avantalia
Carsa
CBT
CEA List
Ceesa
CIC Tour Gune
DevLab
Ellinogermaniki Agogi
E-PYME
Forthnet
I&IMS
IBBT-SMIT
Innovalia
LORIA/INRIA Nancy Grand Est
Metaverse Labs
Nextel
Orange Labs
Philips I-lab
Philips Research
Stg. EPN
Technical University Eindhoven
Thomson
University of Twente
UPF-MTG
Utrecht University
VicomTECH
Virtualware
VU CAMeRA
VU Economics & BA

Countries involved

Belgium
France
Greece
Israel
The Netherlands
Spain

Project start

October 2008

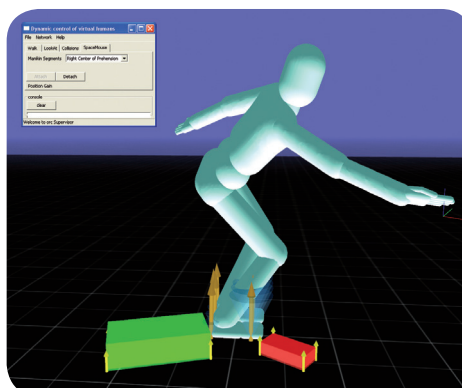
Project end

March 2011

Contact

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Project Results

Missing items included:

- Being able to transfer data and actions between systems in terms of available sensor signals to avoid clicking a mouse and keying in information;
- Feeding real-time 3D video streams into a virtual world;
- Providing support for multiple languages – crucial in social contexts; and
- Support for inclusion of real audio input – for example taking original sounds such as fountains or on the beach and integrating them into a virtual tourism application.

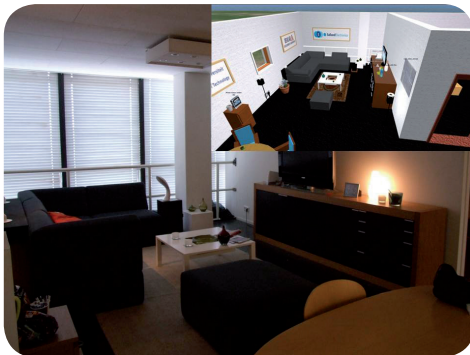
DEFINING AN INTERNATIONAL STANDARD

A key outcome was an international standard within the ISO/IEC Moving Picture Experts Group (MPEG). The first version of the ISO/IEC 23005-1:2010 (MPEG-V, Media context and control) standard was published in January 2011. Work is advancing on a second version of the standard;

deploying biosensors to measure body and environmental parameters and use them as inputs for games and lifestyle-related applications.

MPEG-V defines boundary conditions but the real added value is in the applications – transforming the signal into something useful. This is of interest to consumers, industry and public authorities. Applications have been developed in urban planning for public consultations with virtual demonstrations of the impact of a building project from any angle. A similar approach can be used for other planning like the modelling of utility systems, the maintenance or extension of transport systems.

Other potential applications include virtual travel, technology simulation for museums, ambient assisted living for the elderly, simulation of emergency situations and meetings in a mix of real and virtual world.



Major project outcomes

DISSEMINATION

- 68 publications published in international journals / conference proceedings
- 34 presentations / demonstrations at international conferences/fairs
- 2 project-organised international conferences (Korea & Israel)
- 4 magazine articles
- 2 special issues of the Journal for Virtual World Research (JVWR)

EXPLOITATION

- 2 new product / service combinations:
 - Virtual Travel / Virtual Traces for the Tourist Industry
 - Decision making on spacial problems, tools for (real) Estate Planning
- 4 new systems:
 - Mixed Reality for Next Generation Video Conferencing
 - Social Presence for the Disclosure of (Cultural) Heritage
 - Serious Gaming for Ambient Assisted Living (Social Connectivity)
 - Virtual Presence for Ambient Assisted Living (Safety)

STANDARDISATION

- Creation & completion of the ISO/IEC 23005 (MPEG-V) International Standard

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■ ITEA 2 – Information Technology for European Advancement – is Europe's premier co-operative R&D programme driving pre-competitive research on embedded and distributed software-intensive systems and services. As a EUREKA strategic Cluster, we support co-ordinated national funding submissions and provide the link between those who provide finance, technology and software engineering. Our aim is to mobilise a total of 20,000 person-years over the full eight-year period of our programme from 2006 to 2013.

■ ITEA 2-labelled projects are industry-driven initiatives building vital middleware and preparing standards to lay the foundations for the next generation of products, systems, appliances and services. Our programme results in real product innovation that boosts European competitiveness in a wide range of industries. Specifically, we play a key role in crucial application domains where software dominates, such as aerospace, automotive, consumer electronics, healthcare/medical systems and telecommunications.

■ ITEA 2 projects involve complementary R&D from at least two companies in two countries. We issue annual Calls for Projects, evaluate projects and help bring research partners together. Our projects are open to partners from large industrial companies and small and medium-sized enterprises (SMEs) as well as public research institutes and universities.



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