METAVERSE1
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Bringing reality to virtual worlds

The ITEA 2 Metaverse1 project has developed a standardised global framework enabling interoperability between virtual worlds such as Second Life, IMVU, OpenSim, Active Worlds and Google Earth and with the real world in terms of sensors and actuators, vision and rendering systems, and applications in areas like social and welfare systems, banking, insurance, tourism and real estate. Results of the project drove the MPEG-V virtual worlds standard published by ISO/IEC in January 2011.

Virtual worlds integrate existing and emerging media technologies which can support networked services and drive the development of new kinds of devices and applications. The emergence of virtual worlds as a platform for networked services is seen as an important enabler as it offers the power to reshape the way businesses and people interact with their environments.

Such virtual worlds are found increasingly in areas such as 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. As such, they are isolated solutions with a life of their own. Metaverse1 set out to overcome this isolation – defining a standard to enable connectivity and interoperability between virtual worlds and with the real world.

CONNECTING WORLDS

The objective of the ITEA 2 project was to define interoperability in such a way that it would be possible to exchange information between virtual 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. It would make it possible to transfer all sorts of things that have been added in one world to another.

Even more important and needed from an industrial point of view is the development of a standard interface between the real physical world and the virtual – simulation/serious games – world. This would make 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 comfort conditions in terms of lighting, temperature or ventilation in a room or for personal wellbeing or drive robotic aids for disabled persons.

Another example is the use of 2D digital (video) sources as input for 3D worlds. A lot of what is done today is already available in some kind of IT system. So a standard interface would make it easy to obtain input from all types of existing systems – such as traffic reports, weather forecasts, property details or tourist information – for a virtual world representation or simulation.

DIVERSE CONSORTIUM

Israeli professor Yesha Sivan, head of the information systems programme at the Tel Aviv Academic College, brought the idea of standardisation in the field of virtual worlds to the ITEA 2 project outline event in Düsseldorf in 2007. Jean Gelissen from Philips Research teamed up with Sivan and took on the role of project leader.

Consortium members came from a range of different areas. Spanish partners focused on tourism and virtual travel applications. French partners were interested in technology simulation for museums, with a model allowing people to be present virtually in the space station and experience effects of low gravity. Dutch partners were more focused on ambient assisted living for elderly people – including connectivity with carers.

Finally, Alcatel Lucent in Belgium and France was interested in the symbiosis between video conference and meetings in a virtual world. Video conferencing has limitations – particularly in being static. Meetings in a virtual world can be much more dynamic. People can move around, change seats and participate in subgroups in a virtual world, but there is still a lack of reality – it is not possible to see facial expressions for example. So the idea was to combine the two approaches by projecting 3D footage of participants on their avatars in the virtual world – offering a new way of teleconferencing.

Many of the technologies required by Metaverse1 were not new but it was necessary to identify what was missing and develop suitable solutions. The project therefore defined a series of use cases and looked 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. Missing items, for instance, included: