

3D television edges closer to reality

It could bring a whole new meaning to the term 'reality television'. After the introduction of colour displays and high definition images, 3D promises to be the next revolution in visual technology. 3D television offers users an infinitely richer and more entertaining viewing experience without the need to wear headache-inducing special glasses.



The IST-sponsored project [3DTV](#) is at the forefront of European efforts to bring the promise of three-dimensional moving images closer to reality. Made up of a consortium of 19 partners, the primary goal of 3DTV is to serve as a network of excellence and to harmonise the expertise of researchers working in fields such as imaging and computer graphics, signal processing, telecommunications, electronics, optics and physics.

Project massive in size and scope

The consortium is the largest of its kind in the world of 3DTV, both in terms of number of contributing researchers and in terms of its technical scope. Now almost midway through its 4-year project duration, 3DTV has already built up strong momentum in pooling the resources of its various partners, through activities such as technical meetings, joint research work, exchanges, dissemination activities and establishing a common research infrastructure. "Coordinating the research work of about two hundred people from nineteen institutions in seven countries is a continuing challenge," says Levent Onural of Bilkent University, Turkey, coordinator of the 3DTV project.

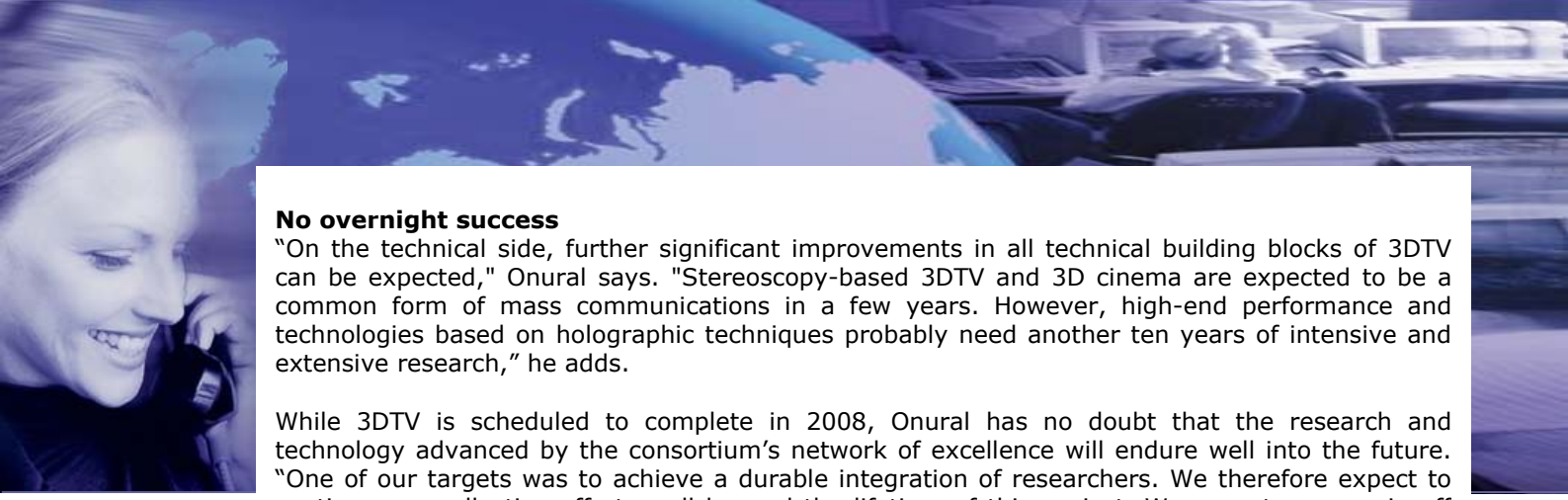
In terms of technical results the team has finished many of its intermediate tasks. "The project technical results so far have been published in about one hundred and forty papers in journals and conferences," Onural explains. "We have working lab prototypes of 3D video capture using multiple cameras. We can process and represent 3D scenes from the captured multi-video sequences, and our proposal for compression of multi-view 3D video data is leading the related ISO-MPEG4 standardisation activities. Furthermore, we can stream stereo-video through the internet, and we have various types of 3D display device prototypes in place."

Multiple applications for 3D

As well as changing the way television is viewed, the type of imaging technology being developed by 3DTV could have applications in many other fields. Example areas are medicine, dentistry, cultural heritage, air-traffic control, military technologies, entertainment and computer games, to name but a few.

While the 3DTV team believes that the project timing is perfect in terms of the current technological environment and consumer demand, they acknowledge that there is still some way to go before viewers will be able to see and directly interact with 3D images in their living rooms. "Dynamic holographic displays for satisfactory holographic motion pictures are still far away," stresses Onural. "Another decade might be needed before they become a commercial reality. However, basic research to investigate these high-end 3D displays is moving forward with considerable momentum."

The 3DTV research consortium has already developed and tested several different auto-stereoscopic displays (essentially displays that need no special glasses for viewing 3D images) and has also experimented with holographic techniques using spatial light modulators. In theoretical issues such as digital processing and the generation of holographic and other diffraction-related signals, the team plans to integrate these across the different technological components to achieve end-to-end 3DTV operation.

**No overnight success**

"On the technical side, further significant improvements in all technical building blocks of 3DTV can be expected," Onural says. "Stereoscopy-based 3DTV and 3D cinema are expected to be a common form of mass communications in a few years. However, high-end performance and technologies based on holographic techniques probably need another ten years of intensive and extensive research," he adds.

While 3DTV is scheduled to complete in 2008, Onural has no doubt that the research and technology advanced by the consortium's network of excellence will endure well into the future. "One of our targets was to achieve a durable integration of researchers. We therefore expect to continue our collective efforts well beyond the lifetime of this project. We expect many spin-off projects, using the current collaboration as a platform, after the 3DTV project ends," he says.

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