3D MEDIA: A Unique Audio and Video R&D Project Spanning Wallonia

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3D MEDIA is part of a new portfolio of R&D projects that will run for five years, financed by the European Regional Development Fund (ERDF). 3D MEDIA covers most scientific and technological aspects concerning the management and processing of audio and video contents. It involves the three largest Universities in Wallonia, the Faculté Polytechnique de Mons (FPMs), the Université Catholique de Louvain (UCL), and the Université de Liège (ULg); it is managed by the Multitel Research Center.

3D MEDIA has already given some spectacular results, such as NeuroTV's capability of projecting in 3D stereo a synthetic avatar ("Toon") animated backstage by an artist (see figure).

While not directly financed by the project, industry is a key player of the project. First, the consortium reaches out to the audio and video industry to identify scientific and technical problems that industry does not have the time, the manpower, or the skills to solve. These problems are turned into well-defined challenges; the universities work on them for, say, 18 months, and the results are then transferred back to industry with appropriate licensing agreements. The overall view is a series of challenges staggered in an innovation pipeline. Second, the three Universities, which are fully financed, are also free to explore more challenging and risky avenues and, where warranted, to transfer this technology to industry. Given that Multitel is only partially financed, it generally needs to find contracts with industry, which also helps in finding technical challenges for the consortium to work on. Once an industrious partner has identified a potential partnership within the project, it can go to the regional government and ask for its own funding.

The consortium partners – Multitel, FPMs, UCL, and ULg – have complementary expertise. Early on in the 3DMEDIA project, they all listed their existing capabilities and looked for ways to combine them to come up with innovative capabilities. One approach was to identify each partner's strengths, and to look for ways in which they could be combined in visual demonstrations, which also proved to be very useful in establishing a dialog with industry.

The different research themes of the 3D MEDIA project can be found at different points along the traditional chain of acquisition, processing, and exploitation/immersion. The project considers advanced acquisition means, such as pairs of stereoscopic cameras, multiple-camera and omni-directional-camera systems, and 3D cameras that can acquire range information directly. The use of several cameras may call for the registration of views, the reconstruction of a 3D scene, and the automatic determination of the position of the cameras. Applications often call for tracking objects and persons, for recognizing them, and for interpreting their motion. Transmission and security calls for compression and for techniques such as watermarking. Mixing real and synthetic data is becoming increasingly important. 'Match-moving' is one technique that allows this to be done automatically. Indexation, annotation, and summarizing of video are important for archiving large amounts of video data. Data mining allows one to quickly retrieve information from large databases of images. Image understanding also plays a role in man-machine interfaces, such as in recognizing gestures and facial expressions. The result of acquisition and processing must ultimately be experienced by the user. Here, we mainly talk about 3D stereo visualization and the creation of immersive acoustical and visual environments.

The application domains of 3D MEDIA are varied, such as 3D cinema, entertainment, sports, and video surveillance. One concrete example in sports is the...