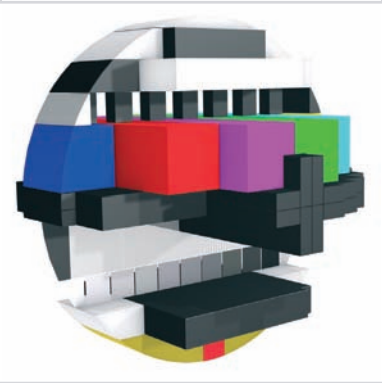
PROJECT RESULT

Networked ICE terminals

MEDEA+

2A207: Tri-dimensional technologies over networks with 2D + Z (TritonZ)



Enabling 3DTV to deliver on its promise

Three-dimensional (3D) TV is considered the technology of promise for the consumer TV market and also has wide potential application in a number of professional markets including machine vision, healthcare and video surveillance. Yet the technology behind 3D image capture and onward image transmission has often not kept pace with that of fast-advancing 3DTV displays. The MEDEA+ TritonZ project addressed that shortcoming, successfully developing higher frame-rate image capture capabilities, a new world standard – CoaXPress – for onward video transmission and an extensive 3D vision processing library.

Three-dimensional TV technology could eventually have more significance for society than the advent of colour or digital television. Potential applications are not limited to consumer markets; they also include a number of professional uses such as machine vision, medical care and video surveillance.

However most 3DTV technology research has focused on technology developments for consumer 3D displays, as well as setting 3D (2D+Z) display standards. By comparison, 3DTV image-capture has been the poor relation in research funding, and 3D image-production technology badly needed updating to keep pace with the increasing capabilities of displays. Such was the purpose of the MEDEA+ 2A207 TritonZ project.

Fast image capture

TritonZ aimed to develop the 3D technologies required to improve image capture for next-generation 3DTV displays. Work focused on 'beyond high definition (HD)' camera acquisition with 2D+Z and higher pixel rates, and 3D-enabled connectivity for on-set pre-visualisation.

Beyond HD is a step towards the long-term vision of a fully functional virtual environment. Once higher pixel rates and 3DTV domestic applications such as naked-eye viewing are mastered, European industries will be able to work on developments towards full multi-view image capture and holographic display, both for consumer and professional markets.

By focusing on the most direct applications for beyond HDTV, TritonZ supported the development of European expertise in world standards for 3DTV. The partners also developed new higher data-rate video transmission capabilities for industrial applications.

Clear benefits

Key achievements lie in two distinct areas: higher frame-rate image capture for machine vision; and technologies for 3D vision. In the higher frame-rate area, TritonZ has established an entirely new standard for moving-image capture and transmission. CoaXPress (CXP) is an asymmetric high speed point-to-point serial communication standard for the transmission of video and still images, scalable over single or multiple coaxial cables. It offers a high speed downlink of up to 6.25 Gb/s per cable for video, images and data, plus a lower speed, 20 Mb/s uplink for communications and control. It was officially approved by world standards bodies in March 2011.

In addition to its use for the TV-broadcast sector, the CXP standard is expected to become the leading interface for machine-vision cameras in high-end applications. It should

bring significant new revenue streams for two of the project partners – interface chip supplier EqcoLogic and Adimec, the company bringing the first cameras to market.

Thanks to its work in TritonZ, Adimec has launched a new camera family using CMOSIS 2 and 4 megapixel (MP) CMOS image sensors together with the CXP interface. During 2011, several 12 MP camera versions are being launched that are able to run up to 300 frames per second.

Displacing CCD cameras

In the 3D technologies area, lead partner Grass Valley has been able to develop a new video-processing library, as well as a CMOS image sensor able to surpass the signal-to-noise performance of the best charge-coupled device (CCD) cameras currently available in the high-end broadcasting market segments. CCDs are currently the most commonly used sensor technology in cameras.

With these CMOS advances incorporated into its product offerings, Grass Valley has been able to decrease the bill of material for an HDTV broadcast camera head by one third. In January 2011, the company began development of two new camera products based on the advances achieved in TritonZ; introduction of both products is scheduled for 2012.

Another project partner, Trident Microsystems, has as a result of TritonZ already shipped millions of higher standard frame-rate converter products that enable its TV-manufacturer clients to implement 3DTV reception and display. These products enable Trident clients to offer even higher standard 3DTV to their customers, and have helped the company retain its lead position in this market area. Trident estimates that competing solutions are lagging more than 12 months behind.

The TritonZ consortium has filed a total of ten patents during the two-year project. Five patents cover the imaging systems, including a novel idea for stereoscopic 3D from a single-lens camera system. This is being researched further in a new CATRENE project – ICAF. Three patents have been filed for the high-speed communications developed in the project, and a further two patents cover the 3DTV displays, including how to handle the graphics user interface on stereo 3D systems, and a method of 2D to 3D conversion.

New markets and research

While continuing to participate in numerous conferences and workshops to disseminate their work and results, the TritonZ partners are also promoting the CoaXPress standard in new markets such as medical, traffic control and video security. Grass Valley also participates in the European Broadcasting Union (EBU) 3DTV Study group launched in May 2010. This group promotes objectives such as encouraging dual-image technology for production, collecting 3DTV requirements for EBU members and liaising with key standardisation bodies.

Thanks to TritonZ's innovative work in establishing solutions for 2D+Z image capture and in going beyond HDTV, the project has helped build and maintain a European capability in advanced 3D vision systems. The results of this MEDEA+ project provide the basis for commercial research into further developments, and ensure a European role in core technologies for high-end 3DTV imaging and high-data-rate professional applications.

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NXP Semiconductors
Trident Microsystems

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End: December 2010

COUNTRIES INVOLVED:

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