LiberoVision

Case Study

bluefish444

October 26, 2009

Based in Zurich Switzerland, LiberoVision (www.liberovision.com) was spun off from ETH Zurich by Stephan Würmlin Stadler, Christoph Niederberger, and Prof. Markus Gross. LiberoVision develops revolutionary enhancement technology for sports broadcasts. Current solutions are designed to provide advanced analysis capabilities to broadcasters for sports shows allowing interesting or controversial incidents to be analysed from the perfect perspective. These capabilities include offside analysis, player speed, pass distances, player tracking, ball tracking, automatic distance calculations, and the ability to watch an incident from a number of virtual perspectives.

The vision is to provide the viewers with unlimited insight into the game. DiscoverEye, LiberoVision's first product, allows broadcasters to generate realistically-looking 3D replays from perspectives not captured by the stadium cameras. It is worldwide unique, patent-pending, and currently available for soccer, American football, basketball, rugby, and baseball.

Since UEFA EURO 2008® - the European soccer championships - LiberoVision has been successfully applied by broadcasters such as ESPN/ABC (USA), ZDF (Germany), ITV (United Kingdom), Orange Foot (France), TV3 (Spain), Televisa (Mexico), and others.

In 2008, LiberoVision's DiscoverEye was nominated for a Sports Emmy in the category Technical Achievement Award for its work on the ESPN Axis. Also in 2008, Red Herring placed LiberoVision among the 100 most innovative European start-ups. Among others, the company also received the Swiss Technology Award 2007.

LiberoVision launched its product line in the spring of 2007, and incorporates Bluefish444 technology, first with the HD|Fury card, and now with the newest Epoch Horizon card in all products. DiscoverEye produces high-quality virtual replays of sports events based solely on the camera images from the TV productions. Thus, LiberoVision needed a means to ingest and output SDI video feeds. After careful evaluation, LiberoVision chose Bluefish444 cards because of their robust capabilities, functionality and API, and uses them for video I/O including remote control over the RS422 connection.

Being able to simultaneously capture and playback on a single card has made for a simplified and more reliable hardware platform by reducing the number of components required. The wide range of pixel formats supported has enabled a smooth integration of the Bluefish card with Liberovision's software. Similarly by maintaining a backwards compatible API Liberovision has been able to quickly integrate support and take advantage of new card models as they have become available. Epoch's 3G SDI and 3D stereoscopic capabilities are of particular use to LiberoVision with its own 3D analysis functionality.

DiscoverEye can create unique perspectives from arbitrary viewpoints where no camera is located. Based on the video streams of the existing cameras only, DiscoverEye generates novel views in very high quality. Now, viewers at home see images in the same realistic quality but from the best perspective depending on the scene.

With DiscoverEye broadcasters can move the virtual camera behind the player and show

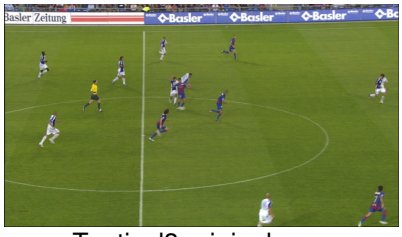
his perspective. Or, they can show the view of the linesman in the moment of the offside situation, fly in a bird's eye view and show the tactical formation for a thorough analysis by their experts.

Not only is the quality of the imagery unique but also its integration requirements are so few that DiscoverEye is easily integrated into all production environments without adaptations. No third-party infrastructure is required at all – no additional cameras, no calibration tools. There are even no restrictions on the camera views. It is easy to integrate into both remote and studio productions.

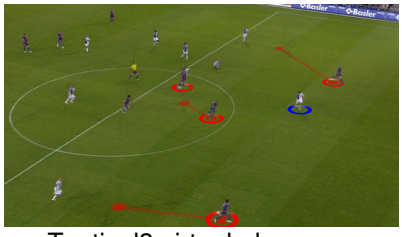
Sports experts can talk about scenes by showing novel views nobody has seen before during the live broadcast. Moreover, the game-deciding moments can be viewed from any perspective and the experts can directly draw onto the field and into the scene using an interactive telestrator.

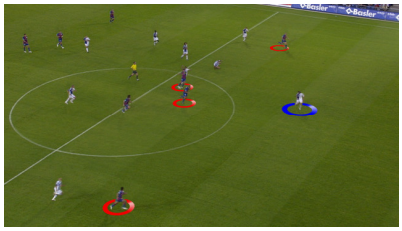
This realistic three-dimensional sports analysis tool dives into a completely new world: Smoothly changing the perspective in the key play, moving players to show their mistakes or run paths, removing players to put the focus on the important players, enhancing the explanations with drawings, and much, much more.

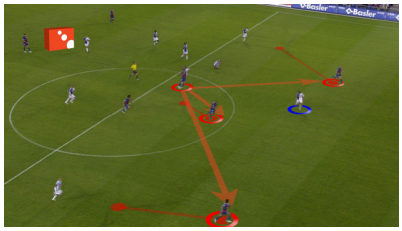
With DiscoverEye's 3D telestrator, the expert round discussing a game will receive a tool that supports the analysis in three dimensions. The experts are able to paint directly onto the pitch – and not on the screen – and while the perspective can be changed to different viewpoints, their annotations on the field remain on the very same position.



Tactical3 original cam


Tactical3 virtual player move


Tactical3 virtual player marks


Tactical3 virtaul arrows - pass options

For EURO 2008, Germany's largest broadcaster ZDF used LiberoVision for their analysis show in their studio in Bregenz. Subsequently, the World Cup 2010 qualifying coverage is being enhanced with LiberoVision as well.

The top game of every round in French Ligue 1 is broadcasted by Orange Foot. Orange Foot started operations in 2008 and offers its services over cable, IP-TV, and satellite. The four hour show on every Saturday evening is split into 3 editorial parts around the two half-times of the game. During one hour pre-game, both the two teams are

introduced and the expert team with former French national team players Youri Djorkaeff, Christian Karembeu, and Franck Sauzée analyze the characteristics of both teams playing that night. During mid- and post-game, highlights, game analysis, and interviews are presented the the viewers.

As ZDF, America's largest sports network ESPN has started using DiscoverEye with the EURO 2008 and extended its use to American Football for the "Monday Night Football" show – the most popular weekly sports program in the US. Even more, the NBA Finals have been enhanced using DiscoverEye, too, and with their newly established broadcast of English Premier League and Scottish Premier League in the United Kingdom. In all sports, the highlights of each event are shown from novel, interesting perspectives to give the viewers at home novel insights and a resource for a short tactical analysis.

Dr. Christoph Niederberger, Chief Technology Officer comments, "In today's increasingly sophisticated world, sports fans expect more than just basic commentary. Because the realistic virtual views with our technology are almost undistinguishable from the real cameras, the viewers at home often do not realize that they are looking at a computer generated image. Utilizing 3D analysis via our advanced sports technology provides them with a unique perspective, and more broadcasters will move that way in the future."