Virtual Reality Ventures Further into the Mainstream

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Virtual reality (VR) is no longer viewed as a new concept by TV audiences, even though what we've seen on our screens during the last couple of years is only a glimpse of what can be achieved. Advancements in technology have helped the number of VR applications to grow significantly, whetting the appetite of viewers who have grown accustomed to complex graphics, virtual sets and product placement.

Looking beyond the latest activity on our TV screens, VR software was first introduced to the industry in the 'nineties. Take-up was gradual, the software may have impressed broadcasters but many were reluctant to pursue any interest further as the cost and complexity of the equipment were seen as major disadvantages. Fast forward to today's virtual reality products and there has been a dramatic technological turnaround. They are now much more accessible to broadcasters and have gone from being costly to cost effective.

Broadcasters are taking full advantage of the increased capabilities of VR technology and, in addition to reaping the cost saving benefits, many are using these applications to raise their production values. One of the biggest recent changes we have seen in the VR arena is the increase in augmented reality (AR); broadcasters are now using virtual graphics overlaid on live images to give viewers a richer experience. In sport, we have grown increasingly used to AR graphics in live broadcasts; sports programmes have tried and tested a range of techniques from regularly generating team logos on pitches to illustrating offside lines or the length of a conversion kick.

Over the last twelve months the use of augmented reality has increased significantly in sports applications. The BBC's long-standing "Match of the Day" football show invested in a full set and brings in elements of both virtual and augmented reality throughout the show. Graphics are frequently used to create transparent pillars at either side of the semi-circular seating area to display various team emblems and images of players, adding a unique dimension to the presenter-led programme.

One area that has benefitted from VR has been virtual advertising; product placement is growing quickly in particular. This was instigated in the UK in February 2011, when Ofcom, the independent regulator for the communications industries, relaxed the rules governing this area. The virtual advertising platform is more flexible, more dynamic and more cost effective in comparison to other traditional advertising mediums. It has seen a rapid uptake with broadcasters looking to open up new revenue streams and reduce their dependency on spot advertising.

Broadcasters worldwide have been effected strongly by a flattening in traditional advertising spend, so to increase commercial revenues, product placement was seen a method of bolstering income. Big name broadcasters have taken full advantage of the latest techniques, and the digital integration of products into popular TV programmes is becoming much more commonplace.

Television advertising is obviously a global business and household name brands vary dramatically from country to country. Therefore shows are shot with generic items on view which can then be replaced with real brands, for a fee, by the broadcaster. Augmented reality techniques enable different branding to be composited onto an agreed object to make it relevant to the country in which the programme is aired. This allows broadcasters to target their own advertisers, making the messages relevant to each national or regional audience.

Virtual advertising in sport is probably the best illustration of how advanced the technique has become in recent years. Today's technology enables many of the traditional approaches to advertising in sports arenas to be replicated in live TV coverage. Advertising boards, painted pitches, giant screens and pitch carpets can all be identically copied, created and replaced in VR. One of the greatest benefits is the compelling proposition this offers to advertisers as well as attracting more sponsorship revenues from the sporting clubs.

In all of these examples of virtual and augmented reality, the success of the programmes ultimately depends on the quality and performance of the VR equipment. The graphics software is often at the top of broadcasters' VR technology agenda; however, there are other, crucial requirements. For example, a broadcaster could choose the highest quality graphic software system, but without the right tracking solution and the right camera support equipment the quality and performance is lost.

In order to composite the graphics and video realistically the graphics system has to know precisely where the camera is pointing so the graphics model can be rendered from the exact same viewpoint. A great example of this type of insertion is the down-and-distance logo onto the playing field in American Football. Not only must the graphics system know where the camera is pointing the field of view of the lens must also be calculated so that the scale and perspective can be correctly matched. To achieve this, all camera and lens movements must be captured, then tracked and communicated back to the computer that is rendering the graphic. Because this type of AR is used so extensively in live sports television, the information must be delivered to the graphics system in real time. To do so requires highly accurate pan and tilt and positional information for the camera. Typically this is provided by an encoded head, such as Vinten's i-Series encoded heads. At Vinten, we have worked very closely with our customers to design heads that are easy to use and provide the precise performance required for VR applications. The Vinten i-Series encoded heads provide a minimum of 1.48 million data points per 360 degrees of panning rotation, easily delivering the levels of performance necessary for AR, both horizontally and vertically.

Technology that perfects camera tracking and eases the installation process for broadcasters has contributed to the surge in recent VR and AR applications. Combined with new and innovative technologies from the graphics providers, shrewd global broadcasters are pushing the boundaries in the VR arena. The sharp rise in recent virtual and augmented reality applications demonstrates that TV channels that react quickly to the latest trends and audiences will certainly appreciate the improved viewing experience.