Explorations in Immersive Entertainment

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Abstract

Today's imaging media requires much science and engineering, yet image content remains elusively dynamic. There are only a few rules regarding the staging, photography and editing of media, and emerging digital technologies are blurring and fragmenting content into myriad new creative forms, resulting in a creative paradigm shift that even professional production schools can't track. Few media writers, film critics, or computer game reviewers can see or understand the vast transformation of entertainment that is happening now. What is about to happen soon, in terms of interactive, participatory Virtual Worlds that are indistinguishable from reality, will shake the foundations of what we now know as television and movies.

Introduction

Working with Stanley Kubrick on his groundbreaking 2001: A SPACE ODYSSEY profoundly influenced my commitment to giant screen movies as an immersive "First Person" experience – with the medium's potential to transcend time and space, engulfing viewers in the CINERAMA screen, and allowing them to seemingly experience events far beyond the limitations of the real world. This was something beyond story, character, performance, dialogue, or any cinematographic or editorial conventions of the time – and that was 1968.

History

A little cinema history. Television once threatened the movie industry so frighteningly that studios spent millions of dollars developing all manner of competitive improvements to the theatre-going experience. We saw Cinerama, Todd-AO, Cinemascope, VistaVision, 3D, stereophonic sound, and more – all to keep the audiences coming back to theatres. It worked for a while, and there was a time when certain blockbuster films were "roadshowed" exclusively in only a few theatres around the country for up to a year or more before broad release. Allowing these films to be shown on television was heresy.

Now

Today the multiplex has demanded a common 35mm film format, interchangeable between all theatres, with the only variable being the number of seats per "house", allowing theatre owners day-to-day control of the percentage of occupied seats to maximize revenue. At the same time the television industry is supplying the lion's share of revenues from movies, and thus the television medium's strengths and weaknesses exert a profound effect upon the nature of movie content.

For example, most television viewing is supported by paid advertising which offers generally higher production values and impact per second than the content they support – whether news, sitcoms, reality shows, series, documentaries, or movies. Via the drive of commercial producers to get as much bang for the buck as possible, they have attuned a whole generation of viewers to a radically new and faster pacing of imagery and sound packed into just a few seconds time, with each flashy transition accompanied by exciting whooshes and thumps to keep viewer's nervous systems at maximum excitement levels. As the technological and imaging differences between movies and television blur together, we are entering a new phase where the production process becomes a single digital medium, with little differentiation between the modest sized screens in multiplex theatres and the large plasma displays in our homes. And the home experience offers many extras like higher image brightness, greater color saturation, better acoustics, more convenience, and lower cost.

I am not saying anything here that hasn't already been front page in the trades, but I want to bring something to your attention. Something that is emerging.

Visual Effects

Again, it is nothing new that content – whether movies or television – uses ever greater digital visual effects processes every day, because it is a cheaper, better, faster replacement for expensive sets and locations, and is superior to the old blue screen opticals, matte paintings, hanging miniatures, rear projection, and other cumbersome optical/mechanical processes of the past. Today we not only see amazing digital sets and locations, we see digital characters and creatures that are seemingly real. Digital artists are progressively subsuming crafts of the past, including photography, lighting, set construction, wardrobe, hairdressing, makeup, and on and on.

Yet even though content is now vastly more digitally sophisticated, digitally edited, digitally recorded – and generally include many more cuts-per-minute than ever before – content is still stories told through characters, with emotion, drama, suspense, action, and all the other classic elements of drama which have remained unchanged for centuries. The process of writing a script has been codified into a set of rules that are so systematized that computer programs exist to keep writers within the bounds of American movie making expectations. The process of screen direction has also been codified into a set of broad rules requiring master shots, two shots, singles, reverses, over-the-shoulder's, and inserts, all framed within a flat rectangle.

And no matter how fabulous and sophisticated the filmmaker's skills and talents – audiences are getting bored. Revenues for films and television are declining for the first time. And the fastest growing and most profitable segment of the entertainment industry is computer games.

Immersion

Why is that? I think it is immersion and self-determination. I think it is interactivity, and the ability of the participant to create his or her own experience, at their own pace. The ability to lose one's self in another world, another dimension, and another time – for hours on end. Then come back to it and continue. And BE THERE. Immersed, and self-determinant.

I spent years believing that immersion was just a movie on a bigger screen, with sharper lenses, larger film frames, higher frame rates, higher luminance, higher color saturation – and I even spent years competing with IMAX with my 70mm SHOWSCAN process at sixty frames per second projected onto giant screens. What I discovered on this adventure was that immersive film was best at simulation – creating a super artificial reality by overwhelming viewer's senses not just with imagery, but also with perfectly synchronized physical motion. So in a simulation movie-ride, you would not just be observing a movie from a third person perspective, you would be "in" the movie, in the "First Person" with all the kinesthetic stimulation of reality. This exploration of immersive entertainment reached a peak for me in 1989 with "BACK TO THE FUTURE – THE RIDE" at Universal Studios theme parks. The film was shot in IMAX with fish-eye lenses, projected onto a huge IMAX DOME screen, and viewed from a dynamically moving Delorean car. It was a special effects, motion base, themed environment extravaganza that is still successful today.

I thought that my quest for the Holy Grail of the ultimate immersive movie experience, as exemplified by BACK TO THE FUTURE – THE RIDE would be hailed as a pivotal moment in movie history. It didn't happen. In fact, no movie reviewer has ever commented on it. There seem to be no movie critics or cinema historians who even have a vocabulary or criteria for understanding qualities of optical or vestibular human stimulation. The idea of the viewer being the star of his or her own dreamlike out-of-body personal experience is heresy. Instead many of today's exciting films get reviews that read "An amazing *THRILL RIDE* of a movie". I believe that today's critics are awe-struck by star power, yet sadly lacking in a deep appreciation of the many image qualities that lead to deep human satisfaction.

Coming Soon

Here is what I think is about to happen. Sophisticated computer game producers and manufacturers are eager for expanded differentiation from movies and television. They are on the quest for wide field stereoscopic immersiveness, which is not presently possible with today's flat computer screens. And they are learning how to tell stories, create new worlds, imbue characters and creatures with complex attributes, deliver suspense and action that is different each time one plays, and deeply satisfy a growing number of people who desire a sense of power and personal control. The available computing horsepower is approaching the ability to create photo-realism in real-time. This industry will soon move beyond its humble beginnings of "first person shooter" games, into sophisticated entertainment that will go far beyond present games, but beyond movies and television as well.

At the same time, more and more elements of films and television are digitally produced, potentially creating a "digital back lot" of assets such as sets, locations, skies, props, vehicles, and even characters and creatures. All available for deployment into all media forms simultaneously. We may soon see a "day-and-date" release not just of the feature film and DVD, but broadcast of the film, televised episodic variations on the film, interactive computer games, theme park attractions, etc., etc., - all drawing from a single, central, digital archive database that is scalable to all media – including stereoscopic three-dimensionality for interactive adventures.

The final key to the quest for the optimum immersive entertainment is the interface between the database of content and the human eyes. We have assumed that screens will always be in a theatre or on a computer or television, but something new and revolutionary is coming soon.

My present work draws upon all I have learned about writing, directing, photographing, special effecting, and simulating immersion – with new knowledge that a technology is emerging that will put imagery directly onto the retinas of human eyes in a way that will be indistinguishable from reality. My guess is that it will take three to five years to develop a product that is ubiquitous, inexpensive, and can become part of one's everyday life – like an iPod for your eyes. I am presently collaborating with Professor Tom Furness at the University of Washington's Human Interface Technology Laboratory (HITLAB), where groundbreaking work is already underway, and where our vision for this breakthrough could well transform the entire concept of the relationship between imaging science and entertainment, education, training, medicine, flight, and more.

Exactly how and when this product will reach fruition, I only know that everything we see happening now in the massive digital transformation of all aspects of media production tells me that it is inevitable. So imagine for a moment a tiny and inexpensive device that can plant photo-realistic stereoscopic imagery directly into your nervous system – in this case, directly onto the retinas of your eyes – and then ask yourself if you will be going to the movies or watching television.

Imagine your personal field of view as the real world, of course. Augment that with all the information you need from your desktop, your computer, your phonebook, your calendar, your appointments and plans, your map and driving directions, your movies and television, your Virtual Adventures, your surgery, your flight plan, your scientific visualization, and more.

Coming soon to the theatre in your head.

Biography

Douglas Trumbull has created special photographic effects for films such as 2001: A SPACE ODYSSEY, SILENT RUNNING, CLOSE ENCOUNTERS OF THE THIRD KIND, STAR TREK-THE MOTION PICTURE, BLADE RUNNER and others. He directed SILENT RUNNING, BRAINSTORM, and numerous special venue films for theme parks and expositions. He patented the first entertainment simulator ride in 1974, and later directed BACK TO THE FUTURE – THE RIDE, using the IMAX DOME process coupled with hydraulically actuated vehicles. He patented the SHOWSCAN film process of 60fps 70mm photography and projection. He has received four Academy Award nominations for best visual effects, and was awarded an Academy Award for technical achievement for the SHOWSCAN camera system. He was recently awarded a patent for a Virtual Retinal Display system.