



# Immersive Universes: The New Actuality

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### **Introduction**

Having the ability to either live within natural environmental constraints or to alter nature in order to serve our desires has been our continual condition. A new "3rd option" is developing wherein we shift our focus towards altering our *internal* instead of our *external* perceptual reality. Altered states of perceptual reality were previously established through sleep, ingestion of mind-altering drugs, mental injury and/or illness, etc. Nowadays, perceptual, proximal, and environmental reality alteration can be achieved when you don a Brain Computer Interface [BCI] headset or sit in a flight simulator. Perhaps the real question is why? Which advantages and/or disadvantages do we profit from or incur? The ability to aid, augment, or alter our awareness can be achieved through 3D immersion.

### **Immersive Universe [IU]**

Immersive Universe is so defined [Oxford Dictionary] */'ɪmɜːsɪv/ [adjective] (of a computer display or system) generating a three-dimensional image which appears to surround the user.../'juːnɪvɜːs/ [noun] ..."2 a particular sphere of activity or experience"*. The desire to immerse ourselves can lead us to various outcomes. The extent and methodology can vary. Proximal, sensorial, or perceptual immersion can produce myriad solutions. As 3D is the affordable vehicle in which we can transport ourselves through immersive universes, the varying 3D applications shall be defined.

### **Ubiquitous Computing [UC]**

Fitting computers & co. into man-made spaces defines the concept of Ubiquitous Computing. In many residences computers have become yet another standard household utility. Our interactivity and/or dependency on or with various computer hardware, software, and periphery products nearly governs our daily lives. The new devices are designed to reside within the spaces in which mankind has created; not the reverse. The state of being either stationary or in transport defines which ubiquitous device is warranted. If we are seated, a desktop device may be appropriate. Furthermore, a desktop device may also serve as a mobile device; as in the case of a laptop. Laptops, size-reduced and augmented with wired and/or wireless capabilities may be required. Ubiquitous Computing ingenuity can lead or follow the challenge of meeting our computing needs and/or desires.

### **Consensus Reality [CR]**

Perhaps CR, which describes itself as "mutually agreed upon" reality is the most fragile and/or volatile of the new crop of tech terminologies. A day may ultimately arrive wherein societies, classes, and castes are united or separated dependent on an accompanying CR assignment. A majority ruling may define future CR model-based governments. In terms of an Immersive Universe, a resulting occurrence, (albeit to far lesser degree) as that from the Hollywood film "The Matrix" may be in the not too distant future.

### **Augmented Reality [AR]**

AR is defined as technology that superimposes a computer-generated image on a user's view of the real world, thus providing a composite view. It is, in effect a sort of prism through which we view our perceptual environment. A chat can occur in person, proximally close. It can as well, transpire via a "smartphone", or handheld device. In terms of AR, the chat can be redefined. For example, every time a user views a computer screen the concept of AR is engaged. Curiously, we routinely toggle between the state of AR (while sitting in front of the screen a computing device) and actual reality. However, an external view of ourselves doing so escapes our *self-awareness*. The latter sobering observation demonstrates how the easily and imperceptibly the defining lines between AR and CR can become blurred.

### **Virtual Reality [VR]**

VR is "the computer-generated simulation of a three-dimensional image or environment that can be interacted with in a seemingly real or physical way by a person using special electronic equipment, such as a helmet with a screen inside or gloves fitted with sensors." The orientation of VR can be based upon a variety of anchoring technologies such as desktop, simulation, Avatar image, or projector. Traditional and alternative methods of VR have been achieved throughout the previous century. In terms of the five senses, VR has materialized as so-called "smell-vision" (smell), television (sight), radio (hearing), "roller-coasters" (touch), "processed-foods" (taste). Breakthrough technologies such as the Brain Computer Interface [BCI] are currently researching the possibility of a fusion of AR and VR.

## Brain Computer Interface [BCI]



[BCI] [also called Direct Neural Interface, Brain Machine Interface [BMI]

The BCI (also known as a "direct neural interface" or a "brain-machine interface (BMI)") was first researched by Brain-computer interface University of California at Los Angeles (UCLA) under a grant from the National Science Foundation in the 70's. DARPA has continued this research. Initial research began with various animals was eventually applied to human subjects. Experimentation primarily focused on repairing sensory acknowledgement within the five senses. Hearing and sight impairment benefitted from BCI technology. BCIs, Invasive BCIs, and Partially Invasive BCIs essentially enable the brain to launch signals which operate external machines. Through a variety of external and internal brain implants, external function and mobility returned to test subjects.

Other related BCI technologies include Electroencephalography (EEG) and Magnetoencephalography (MEG). The commonality of these complimentary machines is that they create an external phenomena to occur from an internal cranial command. BCI technology was illustrated in the movie "Avatar". Immersion transforms itself into manifest reality.

Cyberkinetics' "BrainGate", Neural Signals, Avery Biomedical Devices, Interactive Productline's "Mindball", Guger Technologies' "P300 Speller, Motor Imagery and mu-rhythm", and Starlab have created BCI product marketing strategies for commercial usage. Additionally, the immersion PC gaming industry (i.e. Neural Impulse Actuator, and Emotiv Systems, have embraced BCI research for the entertainment industry.

It is imaginable that commercial incentives may drive future trends towards a "full immersion" paradigm. Perhaps the resolute objective of achieving the abject dissociation between CR and an IU shall one day actually transpire.

**Flight Simulators**

Immersive Universes are attainable with the assistance of the standard FS. The occupant can be transported to a place with its own artificial set of environmental parameters. A wide-ranging variety of data entry can result in the virtual conditions of choice. Longitude, latitude, airspeed, G-Force, etc. can be adjusted from the control room. The flight simulation may be to test a new aircraft or even *the health of the pilot*. In any event, the FS can be accessed through a PDA or the gigantic FS at the NASA Ames Research Center facility



NASA Ames Research Center Vertical Motion Simulator



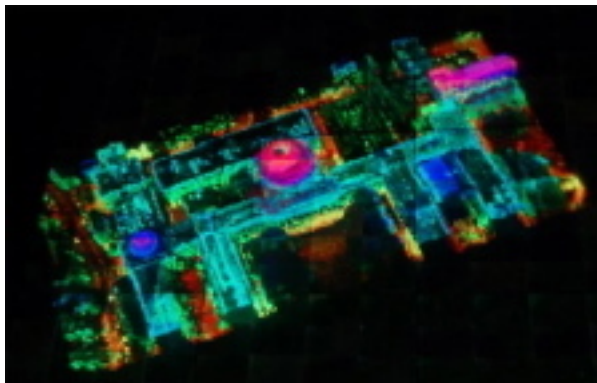
Boeing TFS Flight Simulator

**AlloSphere**

There is another classification of FS's which have been in public use for many years. This technology may only offer a partially-immersive environment. Either the pilot is continually aware of the given simulation, or the simulation does not constitute immersion in terms of engaging more than one sense (i.e. taste, touch, etc.). A movie-theater or amusement park ride may even offer semi-FS associations. The AlloSphere research facility at the University of California, Santa Barbara (UCSB) is capable of achieving just such a 3D simulation. The Allosphere measures a whopping 62,000-square-foot (5,800m). It opened in 2007. IMAX for example, is partial-immersion wherein essentially only the eyes and ears (in some cases the sense of touch) are "immersed".

**Holographic Interactivity**

In order to achieve the ultimate goal of "full immersion", many hurdles must first be overcome. There are many new technologies on the horizon of breakthrough advancements in the area of IU.



DARPA Interactive 3D Holographic Map Table  
DARPA Urban Photonic Sandtable Display (UPSD)



Claytronics (Carnegie Mellon and Intel)

Two of the leading immersion technologies which are in the testing and research stages are the DARPA Interactive 3D Holographic Map Table and Claytronics.



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### **DARPA Interactive 3D Holographic Map Table**

Holography has historically played an essential leadership role in terms of IU's popularized in many movies. This technology has influenced the direction of creative technology in related fields. DARPA's Urban Photonic Sand table Display (UPSD) enables users to form 3D holographic objects. This fully functional technology can allow 360 degree views and alterations of 3D CGI forms *without* the aid of 3D glasses or headsets. Although the UPSD was designed primarily for military application, it may eventually find its way into the consumer market.

The ability to shape or mold 3D objects may one day replace the traditional creative methods employed in architecture, engineering, and design.

### **Claytronics**

Another 3D shaping and molding technology is also on the near horizon. Carnegie Mellon University is currently in the R+D stages Claytronics development. Claytronics technology employs individual nanometer-scale computers called "claytronic atoms" or "catoms" to shape themselves into material objects. Conceivably, an IU becomes a CR. Given the fact that actual material objects will be created and applied to an IU, the result would become "altered reality".

The end-user or pilot would be positioned within a simulator or environment wherein the catoms would be given a wide birth. Within this space, an active participant or group of participants could manifest their own world. Catom life-forms, particle systems, etc. could be instantaneously summoned and introduced into the Claytronics reality template. Being indistinguishable from naturally created objects to the touch, these objects could populate any given scene.

### **Hedonism**

hedonism |'hēdn,izəm| noun (the pursuit of pleasure; sensual self-indulgence. • the ethical theory that pleasure (in the sense of the satisfaction of desires) is the highest good and proper aim of human life. DERIVATIVES hedonist noun hedonistic |,hēdn'istik| adjective hedonistically |,hēdn'istik (ə)lē| adverb ORIGIN mid 19th cent.: from Greek hēdonē 'pleasure' + -ism .

With the derivation of sensory pleasure as the main driving force, questionable technological practices will undoubtedly ensue. Just as innocent IU templates will be invented, conversely other templates will invite moral ridicule. Currently, the adult and violence oriented markets for CGI based products is relatively marginal in terms of the global economy. However, it requires little imagination to conceive of a future society with full access to fully immersive worlds replete with virtually anything a mind can create. Using the argumentation that IU's are not "real", scenarios which truly test the boundaries of acceptable morality would be held thereafter in question. As social morays turn, previously unacceptable private or social conduct could become irrevocably altered. As trends turn towards ever more adventuresome content, company market shares would soar. However, as we already see today, the pursuit of pleasure motivates further invention.

As previously mentioned technologies (i.e. Holographic Interactivity, Claytronics, Brain Computer Interface [BCI], etc.) are combined in order to create new realities, so-called "parallel" and/or "multi-dimensional" lifestyles may change the future course of human history forever.



### **Summary**

At this juncture, it is difficult to say what the future will bring in terms of IU's. Adopting a pragmatic approach when invoking new forms of CR's is desirable. Caution and respect must be given in order to ensure that consumers understand the gravity and results that new technology creates.

Currently, we are exclusively confined within the constraints of the CR. Our five senses claim millions of years of evolution in association to environmental norms...until today. You first see and then bite into an apple. The apple is familiar to you from a sensory perspective. A full IU could change this very sensorial compass.

How will the five senses compute future IU conditions?

Will full IU's alter our current sensory orientation?

To what fantastic extent will future IU's take us?

As virtually any material object can be invoked within the context of the IU, will objects that were formerly considered as "actual" become indistinguishable from IU objects?

Jurisprudence must be applied to a future setting in terms of the IU. Active governing systems can be applied in such a way that questions and issues concerning IU's can be answered. Individually or combined, the aforementioned IU technologies will chart a new path for humanity.