Haptic Holography: Acoustic Space and the Evolution of the Whole Message

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Haptic Holography: Acoustic Space and the Evolution of the Whole Message

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Abstract. The paper argues that the Haptic Holography Work Station is an example of a medium that fits with McLuhan’s notion of Acoustic Space, that is it is a medium which stimulates more than one sense of perception at a time. As a result, the Haptic Holography Work Station transmits information about the subject much more rapidly than other media that precedes it, be it text, photography or television.

The term hologram, coined by its inventor, Dennis Gabor (1900-1979), derives from the Greek words “holo-” meaning “whole” and “-gram” meaning “written”, “message” and “picture”. Around the same time Gabor was pioneering a system of whole writing or a whole message, Canadian media theorist Marshall McLuhan (1911-1980) coined the phrase “the medium is the message”. McLuhan’s theories still resonate to this day. Though he was never able to use the Haptic Holography Work Station designed at OCAD-University with Professor Michael Page, McLuhan’s theory of acoustic space applies to the invention. The Haptic Holography Work Station is not a new invention, but rather one that integrates current technologies of computers, robotics and holograms. I argue that the merging of these technologies creates the most complete example of a medium that creates acoustic space, that is a medium that is able to transmit an instantaneous message of information through visuals, sound and touch all at once in three dimensional space.

Media that are audio-tactile are those that engage more than one sense at a time, such as television, and they create what McLuhan calls ‘acoustic space,’ where the senses are in interaction with one another. In contrast, McLuhan believed that extracting information from 2D visual sources, for example text written using a phonetic alphabet, was a linear uni-directional way of receiving information that stresses linearity, which he called ‘visual space.’ McLuhan suggested that with electric media, linear uni-directional print was no longer the dominant medium and that we are currently living in a new electric age that retrieves the patterns of oral-tribal cultures. “Acoustic space is organic and integral, perceived through the simultaneous interplay of all the senses; whereas “rational” or pictorial space is uniform, sequential and continuous and creates a closed world with none of the rich resonance of the tribal echoloud” (McLuhan: 1969).

With electronic media, such as television, radio, and arguably holograms, audiences receive electrically-configured information in an ‘all-at-once’ or holistic experience similar to how auditory
information is received from all directions at once. “Auditory [or acoustic] space is that sphere of simultaneous relations created by the act of hearing. We hear from all directions at the same instant (McLuhan: 1960).” In this regard, a hologram is similar to sound because it occupies acoustic space; it involves multiple perspectives of the whole where there is no centre and no linear way of looking at it. What makes a hologram “whole writing”, as opposed to a photograph (which literally means to write with light), is that there is parallax, i.e. the hologram contains multiple perspectives of the whole. It is not, like print, uni-directional, occupying one sense at a time where you can only get the whole picture if you go in a linear sequential order starting at a beginning be it a word, a sentence or a monograph.

With our project, the Haptic Holography Work Station, one can both see the hologram and feel the outer surface of the holographic forms. Thus, the holographic display you can touch with a robotic arm provides an example of how a visual medium creates acoustic space, for there is no centre and no linear way of feeling an object and more than one sense is at play. The Haptic Holography Work Station works by merging multiple media, including programming, a computer, a haptic controller and a holographic display. A robotic arm provides dynamic resistance, allowing one to feel contours of the whole object in the holographic scene. McLuhan’s description of acoustic space, namely that, “you trade an eye for an ear” when watching television applies to holography, and haptic holography as well, because your eye functions like an ear when you look at a hologram, absorbing light from different perspectives simultaneously versus directionally. When using a haptic controller, you receive information from many points in space, and there is no beginning and no end, and no correct, linear, rational way of feeling or seeing the subject. The experience is totally immersive.

Another way of putting it is that a text has a beginning, a middle and an end, which is not the case with either a hologram or a haptic-hologram; they have no beginning, middle or end.

The Drum Simulation in the Haptic Holography Work Station at OCAD-U is the best example of acoustic space because of the way it affects the human sensorium where the three major senses: sight, sound and touch, interact with one another. The user sits before a laser-lit transmission hologram of a miniature drum set on a 30cm x 40cm plate and holds the haptic device which appears on an OLED screen behind the hologram as a 2D drum stick. The hologram is projected so that it occupies the same space as the drum stick on the screen, allowing the user to feel the drums, see the stick hitting the hologram of the drums and hear dynamic audio feedback of a drum kit being played.

CONCLUSION:

The Haptic Holography Work Station, I argue, is the evolution of the whole message, where you are not only seeing something in three dimensions but also feeling something in three dimensions; something that doesn't actually exist there. The Haptic Holography Work Station engages multiple senses at the same time, fulfilling McLuhan’s notion of acoustic space which is audible, tactile and in this case, visual as well. In conclusion, the message of a Haptic Holography Work Station is the whole of the object it transmits. Its impact on the world today is that we can receive information about an object or subject faster than the amount of time it would take to read a book about on the topic and more intimately than the idea we could get about the object from still pictures or television.

References

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