**The Evolution and Future of Mediated Reality**

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Actually, Mediated Reality (MR) is a kind of concept rather than be counted as a technology. It also include Virtual Reality (VR) and Augmented Reality (AR). As the one of specific technologies about Mediated Reality, computer-mediated reality refers to the use of wearable computers, hand-held device to increase, decrease information or otherwise manipulate people's ability to perceive reality; the mostly common example is the smartphone for now. Also, some kind of the headgear such as `Wearable Wireless Webcam' ("Wearable,Tetherless, Computer-Mediated Reality") had been designing for resolving obstacles to people with disabilities in terms of blindness. Therefore, the technologies be derived from this concept, Mediated Reality, could be an extreme revolution for the human history. I will talk about it around twenty-five years to analyze how it will be based on the history of its development.

From 1994 in Massachusetts Institute of Technology, “with the advent of the World Wide Web,” Steve Mann began “exploring the use of my Web page as a means of sharing my day-to-day visual experiences with others (1996).” He recorded that researchers at Johns Hopkins University have been experimenting with the use of cameras and head-mounted displays for helping the visually handicapped. Their approach has been to use the optics of the cameras for magnification, together with the contrast adjustments of the video display to increase apparent scene contrast (Lions vision research and rehabilitation center, 1995). This example will typically arrive by changing the video input stream of light eyes of the user and change it by calculation, it was filtered to form more useful to realize the intermediary reality. The first of the two goals for him was to propose further exploration of the spatial filtering capability of WearCam as an assistant to the partially sighted. “The apparatus is worn over the eyes, and, in real time, computationally augments, diminishes, or alters visual reality (S. Mann, 1994).” He called this The `Personal Visual Assistant (PVA)' and made a basic type of WearCam by serving as a wearable, tetherless color stereo `reality mediator' made from video cameras and battery-powered display. He wore the apparatus in identity map configuration (cameras connected directly to the displays) for several days. he could easily walk around the building, up and down stairs, through doorways, to and from the lab, etc. he did, however, experience difficulties in scenes of high dynamic range, and also in reading fine print. However, in order for the `personal visual assistant' to be useful, it will need to be small, lightweight, tetherless, and unobtrusive. Many of the design issues have already been dealt with, but much remains to be done. For example, a sufficiently powerful body-worn computer with eye tracking capability will be necessary before the PVA will be of widespread use to the visually challenged. The ‘visual memory prosthetic’ is the second application of WearCam described in this paper. While the PVA was based on spatial visual filtering, the `visual memory prosthetic' is based on temporal visual filtering. For this part, the meaning is “Deliberate artificailly--induced flashbacks were explored as a means of assisting those (author included) suffering from a visual memory disability. Two modes of operation were presented, free-running flashbacks (requiring no input or attention from the user), and user-controlled flashbacks. The former mode of operation did not require conscious thought or effort, and is therefore truly cyborgian. The use of annotated flashbacks was also explored, in particular, through the implementation of a wearable face-recognition apparatus. This work begins to enlarge the scope of the concept of `memory', for it is now possible to `remember' something that one never new in the first place (Steve Mann, 1994)”; as long as someone logs in to the database, they will all be shared and presented on your device.

Based on what Steve Mann conceived, he had set an almost completed technical standard for mediated reality; and the early machine they made in 1994 was a real machine worked with augmented reality. Then as the time goes by, the technology designing based on mediated reality was rapidly developing. Many kinds of tools with maturely functional features of virtual reality and augmented reality even can be found in the social markets by several major companies that are designing in this area such as Google, Microsoft, HTC and the VOID. Google Glass can be referenced as the lightweight AR device; It has the features: touch pad, camera, monitor, traffic information and map services, and games. Apps for Google Glass are made by third-party developers and provided for free. In addition, Google glasses can also run many of Google's own applications, including Google Now, Google Maps, Google + and Gmail; third-party applications have been disclosed, including Evernote, Skitch, the New York Times and Path. According to Steve Mann’s plan which the tool should be sufficiently portable and can share the data for users, it is an epoch-product for the digital market. January 15, 2015, Google announced that it will stop producing the current form of Google glasses, but still committed to product development. For the middleweight AR devices, there also have some smart glasses like Microsoft Hololens. It can superimpose 3D digital model in the field of vision and assist in the field of engineering, such as factories or construction sites. For stereoscopic effect, it uses binocular prism optical fluoroscopy. Microsoft also refers to such glasses as “mixed reality (Microsoft HoloLens).” Then, put on the VR head monitor, back the computer, in a game full of experience and management of markers and external camera; people now call this experience Dynamic VR. In theory, this is called a heavyweight AR experience. It may appear from the merchant HTC or The VOID is now available dynamic VR products. According from what the VOID explains, “[t]he VOID is a whole-body, fully immersive experience, with you, your friends and family physically inside the action. It's location-based entertainment - that you visit one of our locations - and you walk into real-time virtual reality that combines interactive sets, real-time effects and amazing technology (FREQUENTLY ASKED QUESTIONS, the VOID).” At present, this technology is mostly used in the gaming industry and film industry such as The VOID in cooperation with Lucasfilm. Without these AR technologies which are easy to cost thousands or more dollars, the Virtual Reality product can also bring great visual experience to people and is much cheaper also. Modern VR products usually are made as the kinds of headgear. They distribute the lens through the left and right eyes, display 3D images to the eyes, and manipulate them with the controller. Two of most representative products are VIVE which is designed by HTC and Oculus rift by Oculus VR.

However, the actually machine or tool with mediated reality are going into the people's vision are really few. Although more and more VR and AR tools can be appeared in society for now, they are compared to what the concept of MR want to be is still so far away. The ultimate ideal of mediated reality is not to become a game or film consoles, but to reform human visual perception. Smart glasses not only allow people to see more or less than the naked eye of the real picture, but also in this picture superimposed any digital contents. According to what Steve Mann stated in `Mediated reality' in December 1994, “[a] means of mediating (augmenting, enhancing, deliberately diminishing, or otherwise altering) reality, in real time, through an apparatus worn over the eyes, will first be described using an idealized implementation based on a hypothetical `lightspace glass', and later in a more practical implementation, using video camera(s), a head-mounted video display, and a combination of body-worn and untethered remote processing hardware. In either case (idealized or practical), the entire apparatus will be referred to as a `Reality Mediator' (RM).” For example, a soldering scene that the naked eye can not look directly at will become clear and gentle in the MR glasses. The glasses allow the wearer to complete the work in progress through the guidance of the digital contents while seeing the scene. Such as what Steve Mann was planning to WearCam for handicapped persons, this technology will be set to as a kind of visual enhancement to instead of what the human vision can reach. But that seems still hard at this time. Therefore, take a step back, make more development of AR industry will be a credible and immediate solution. Such as Google, it created the project called Google Expeditions bring AR technology to the school for helping more children to build and grow more their knowledge frame (Bring Your Lessons To Life, Google). Combining human eyes and vision to seamlessly integrate real world information with virtual world information; reducing distance from the real world without factors due to physical problem of human. So that civilian equipment is no longer limited to small-scale or low-vision visual aid; People of average affordability can also enjoy what the heavyweight AR tool has now. For example, people can depend on the AR machine to take activity with teacher and classmates for face-to-face rather than they have to figure out geographical conditions and national factors then go to the classes and take it.

MR concept than VR and AR, Larger scope, not only to be both AR and VR, but also on the basis of coordination, to create new technologies, research new algorithms. The advent of smart glasses centered around these concepts will lead to conceptual changes in people's understanding of computers. This is a philosophy and also a trend in computer development in the history of mankind.

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