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A guide to memory and virtual reality recall

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Abstract. Background: As time passes, people forget the past and everything that happened in the past fades into memory with the passage of time. Time, space and orientation are added. Objective: To recreate scenes, evoke memories and share memories through the adaptation of virtual reality technology. And, allowing for a more realistic reproduction of memories. Methodology: Use software to input text, video, audio, photos, etc., set the scene and recreate it through potential logical substitution based on the five senses (hearing, sight, touch, taste, smell). This work is not only an effective aid to the treatment of mental illnesses. Another example is the cultural heritage, which is a very effective solution to the problem of passing on a particular technique. Also, it is a new way for people to record and share their lives, to explore the past and to preserve the good things. My point in designing this project is that through this project memories can be preserved more completely and the past can be more authentically recreated.

Keywords: computer, vision, reinforcement, learning.

1. Introduction

In the early 1950s, the phenomenon of memory began to be interpreted in terms of information processing theory, which saw it as a process of coding, storing and retrieving information. Since then, the classification of memory has been based more on the differences between the information in memory and its coding, storage and retrieval. Memories are classified as long term, short term, or perceptual according to the length of time they are stored, as semantic or contextual, as implicit or explicit according to whether the information is conscious, as prospective or retrospective according to whether the information is directed to the past or the future, and as a result of the fact that the information is not stored [1].

With the continuous development of digital technology, such as digital acquisition, digital storage, digital processing, digital presentation and digital dissemination, specific memory resources are transformed into digital memory forms that can be preserved, associated, regrouped and shared, so that they can be interpreted with new perspectives, new subjects can be involved, new topics can be organized, new ways can be presented and new needs can be utilized [2].

Surrounded by the cold steel and concrete of the city, people using cold technological products feel more depressed and isolated than ever before. With their basic needs met, people are more concerned about their emotional needs and spiritual comfort [3].

Alzheimer's disease, Parkinson's disease and cerebral infarction are all common diseases in the elderly. Although the etiology and pathology of these three diseases are different, they all cause

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cognitive impairment, especially memory impairment, but the different diseases have their own characteristics in terms of memory impairment [4].

In recent years, with the increasing advancement of technology and the development of rehabilitation concepts and methods, various rehabilitation tools and techniques have emerged in the field of memory disorders, such as external aids, computer-assisted training, telecognitive rehabilitation, virtual reality (VR) technology and low-frequency repetitive transcranial magnetic stimulation. VR is a technology that combines advanced computer technology with specialised hardware and software equipment to simulate functional movement and manipulation in a realistic environment for the purpose of functional reconstruction [5].

Currently, with the advancement of digital technology, digital visual technology can incubate cultural heritage such as ancient buildings and cultural relics, creating their digital twin forms so that they can exist, continue and be widely disseminated in multiple forms. At the same time, in the process of interacting with visual information, audiences extend their image perception of ancient buildings and cultural relics to their memory of history, thus constructing a visual symbolic representation of cultural digital memory, and to a certain extent forming a historically significant heritage and continuity [6].

Memory loss associated with ageing is a problem for older people in their daily lives, particularly in the case of situational memory Situational memory is the memory of temporal and spatial locations in everyday life and includes both item memory related to the content of the event and source memory for the context of the event. Older people are less adept at determining the source of events than they are at item memory .or example, older people may remember a friend, but may not remember when and where they met that friend. In recent years, most studies have examined changes in older people's memory from an encoding perspective, suggesting that there is an impairment in the ability of older people to bind their memories. The intersection of people and objects is the result of an exchange between them, leaving traces that may go beyond the familiar visual image. This process leads to reflection and analysis, stimulating a deeper understanding of the things around us. Such traces are memories, which cannot be recreated but can only be triggered in the mind, and which give life to the objects in front of them, thus making them extraordinary.

Long before the concept of mediated memory was developed, memory was inseparable from its mediators in memory research. In the field of cognitive psychology, the brain as a mediator of memory is an 'imperfect' repository and a private, interdependent vehicle of memory. Habwach brings memory into the social sciences and reveals its constructive character. The Asmans further trace and compare the evolution of memory vehicles and their shaping of the nature of memory. The concept of mediated memory was developed to further break down the boundaries between the individual and the collective and to examine the interaction between memory and the medium. In memory studies, media and memory move from deposition, to reshaping, and ultimately to an intertwined and shaped relationship, showing more clearly the universality of media and the pervasiveness of mediated memory [7].

The first medium is the written word as a 'perpetual medium and memory support'. The view of the written word as the most reliable medium of memory is based on the presupposition that, in contrast to other media, the written word is resistant to the "second death" of memory, i.e. to forgetting, and thus to immortality. This view was based on the idea that images, buildings, etc. were subject to erosion over time, whereas the transparency of the written word corresponded to the immateriality of ideas, so that physical damage could not threaten its essential function of carrying and transmitting memories. However, doubts about the status of the text began to arise in the 18th century, and these doubts were twofold. Firstly, the inherited value of the text required that it be read, yet written information could still be destroyed and lost, and thus lost to future generations of readers and completely erased. Secondly, the written word, as an encoded message, embodies a conscious reconstruction and representation of the past in a time that has a tendency to 'deceive itself' and is thus potentially inauthentic.

The second medium is the image. In an age when words were highly prized, the image, as a contrast, was considered to be an imitation of the archetypal image and thus distanced from the original object from the outset, a distance that grew with time and damage; words, by contrast, were an 'overflow' of ideas and could therefore be reproduced without the need for clumsy imitation. After the 18th century,

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however, historians discovered the unique advantages of images as historical vehicles, arguing that they also had 'immediacy'. This immediacy required not homogeneity or transparency with thought, but rather a strong overflow and expression of emotion, an uncontrollable emotional potential, and therefore a powerful stimulus to memory, more memorable than a pallid conception. The third medium is the body. The memory that is carried and mediated by the body is the result.

It is inscribed through long-established physical habits, "unconscious accumulation and violence", with two distinctive features, namely reliability and incompatibility. The experience of violence is engraved into the body in consciousness, norms and customs, forming an unconscious but durable and stable group identity, which becomes a stable vehicle for memory through the emotions attached to it. "Connauton [8], the originator of the concept of 'social memory', also noted and focused on the body as a medium of memory. In Connaughton's field of study, the body is represented as a more active object, internalising structural traditions through constant training and repetition of bodily movements that can be practised spontaneously and unconsciously.

The fourth medium is place. The construction and retention of memories is dependent on place. This effect of place stems first and foremost from its long association with the group, as Asman refers to 'intergenerational places', which sustain and carry a long, fixed family history, so that the individuals of a family are interlinked like chains through this stable place and live on. Modernisation, however, has increasingly sought a neutral, flexible and alternative "space" in place of a mysterious and specific "place", leading to the replacement of the place of memory by a neutral space and the crisis of the disappearance of cultural memory [9, 10].

2. Design concept

Through the use of the five senses, the product will resonate with the user, allowing the user to immerse themselves in the experience and remember what happened, and through virtual reality technology, cultural heritage can be passed on, such as the skills of artisans, painting techniques, sports skills and other techniques that cannot be clearly described by words. Through this technology, users can experience what their predecessors felt at the time, making it easier to pass on culture without losing it.

2.1. Sensory analysis

Visual: Humans are extremely sensitive to vision, and the perception of vision is the first step in understanding objects. Human visual memory is often fragmentary, inaccurate and complete. Fragmentarity and inaccuracy are linked, mainly because people remember the simplest, characteristic shapes of an object as a whole, while ignoring other aspects of the object that are complex and featureless. Completeness is mainly due to the fact that people remember the shape of an object together with its cooler, material and other features, and that in certain situations a single feature, even if it is only the cooler, can recall all the features of the object in memory.

Aural: The significance of including auditory memory in the emotions that elicit memory is to maintain the integrity of the memory experience and to enhance the recognizability of the memory. For example, when a student hears the song "Go Home" as a child, he knows that class is over, and when he hears it many times over the next few years, and when he leaves school as an adult, he reacts to it whenever he hears it anywhere else.

Haptics: Perhaps what people don't realise is that touch is an essential way of communicating with objects and that a comfortable touch experience brings the user closer to the product. Jonny Ivey has found that consumers are more interested in the hands-on experience in Apple shops, and they never mind moving or touching the computers to experience them.

Taste and smell: Emotions based on taste and smell memories are very rare, due in large part to the limitations of modern technology and techniques as well as citation, but there are exceptions. For example, food that tastes too good can make eating the same product wait and feel tasteless, or smelling a particular scent

2.2. Sensory simulation methods

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Visual effects can be carried out through virtual reality technology to simulate what the environment already sees. Hearing effects can be simulated by spatially differential sound transmission through multiple audio or headphones to imitate the sound of what is happening from where in the scene. Tactile effects can be simulated by stimulating the skin with bio-currents in the gloves to simulate the texture of the objects touched. The smell effect is simulated by the scent diffuser carried in the main unit.

3. Equipment

3.1. Software

The software is the mastermind of all the other devices and is programmed to analyse text, audio, video, photos and people and to continue to scan and match the restored sites, transmitting the restored data story content to the host computer for assignment. The software not only has the ability to create scenes but also to watch memories shared by others like short videos, download shared data for experience and publish your own memories on the software, as well as having a shopping mall designed for the sale of custolmised equipment and ancillary materials for those devices.

3.2. Mainframe

The mainframe has all the offline content, the role of the mainframe is to assign tasks through the content transmitted by the software, such as spraying environmental simulation liquids at specific times (similar to perfume, except that the smell is configured by the desired smell of the environment), and also has the role of a speaker.

3.3. Eyeglasses

The idifference with normal virtual reality glasses is not particularly large, agreeing to have virtual reality technology, except that there is a half-wrapped headset on the eyes for the transmission of sound, and also in accordance with a simple scanning apparatus, and then the user voice glasses when the space scan, so as to ensure the user's safety and judgment of the space location, as well as to the real environment objects accidentally This ensures the safety of the user and the judgement of the spatial position, as well as the adjustment to unexpected changes of objects in the real environment.

3.4. Gloves

The principle of this special glove is that the human body perceives information through the skin, which consists of a combination of four basic mechanical stimuli: vibration, pressure, lateral stretching and relative tangential movement. So the glove works by stimulating the skin's sensory system when an object is touched, thus tricking him into thinking that he is touching an object from his own virtual reality.

3.5. Other external devices

Other devices can be connected to the host via Bluetooth to simulate the environment, for example the air conditioner in your home, which can be paired via software to control the temperature when simulating the environment. Another example is a humidifier that can control the humidity of the environment via the humidifier.

4. Operational logic

4.1. Scanning

Through the software to carry out the scanning system to scan, the items in the real scene to scan, for example, the user in the room ready to restore the environment in the beach holiday, familiar with his need to scan the location of the furniture at home, the items on the table, so that you can make the software to produce a realistic restoration of the base model in the venue, to carry out the location of the judgment to ensure the safety of the user's use, not only that the scanned items in the software The

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scanned items are saved in the software in a style that is easy to use next time. At the same time in the user's virtual reality glasses there is also a miniature scanning instrument, through this miniature scanning instrument can carry out simultaneous factual scanning analysis of the restored site for example when the software scans the chair on the left side of the room, but in the experience of memory the chair is on the right side of the room, so then the virtual reality glasses will deal with this situation, to avoid the user seat empty accident.

4.2. Replacements

The underlying logic of the software is replacement, by scanning the items and then replacing them according to the items needed to restore the memory (except for items that need to be self-adjusted) for example an office chair can be replaced with a beach lounger or a small bench or even a sofa or park bench. The replacement logic is reproduced from memory using the user's input and the user can choose the age, colour, style etc. of the furniture to match, or even model it themselves if they don't have it.

4.3. Input

By entering text into the software, the user can add content to the memory story, determine the direction of the storyline through text input, construct a character image through pictures, videos and text, and the system automatically generates a 3D image of the character, which can then be detailed, pinched and shaped. Not only that, but the scenes in the memory can also be adjusted to make the memory more realistic.

4.4. Shared resources

The sharing platform is a part of the software that not only has a memory sharing system, which means that it releases its own memory resources like a short video for analysis, but also shares its own data for others to experience, and then when different people scan the item, the base shape of this item will enter the background database, which is the inventory of replacement logic thus enhancing the style of replaceable items in the software, thus No shortage of replacement resources

5. Usage process

5.1. Process explanation

1) Login; 2) Go to the settings screen; 3) Scanning the real world environment; 4) Enter the content of the storyline; 5) Outlining details (memory scene models, object models, character models); 6) Connecting ancillary equipment (No equipment base equipment needs to be purchased); 7) Addition of additional items (diffusers); 8) Making memories; 9) Relive your memories; 10) Sharing memories (Options available). The Figure 1 shows the interface style diagram.

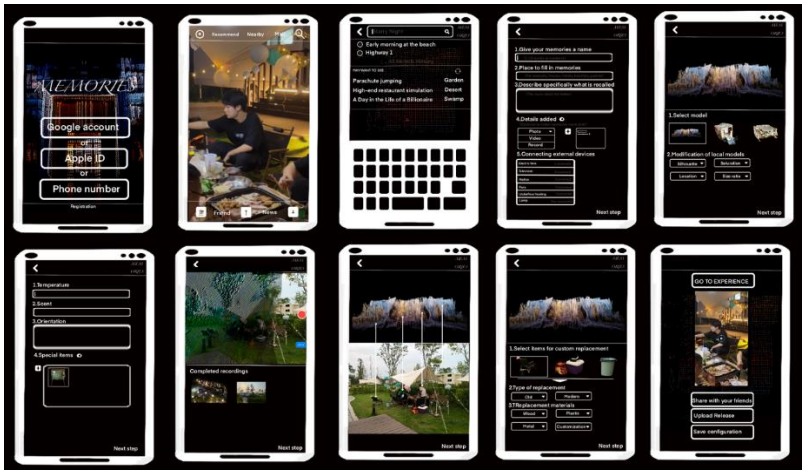


Figure 1. Interface style diagram.

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5.2. Example

An old man returns to his hometown after thirty years of wandering abroad, and is gloomy when he sees that the place where he and his old friends used to play cards has become a park, so he reminisces through this machine.

The image below is a software scan of a live scan analysis (see Figure 2).

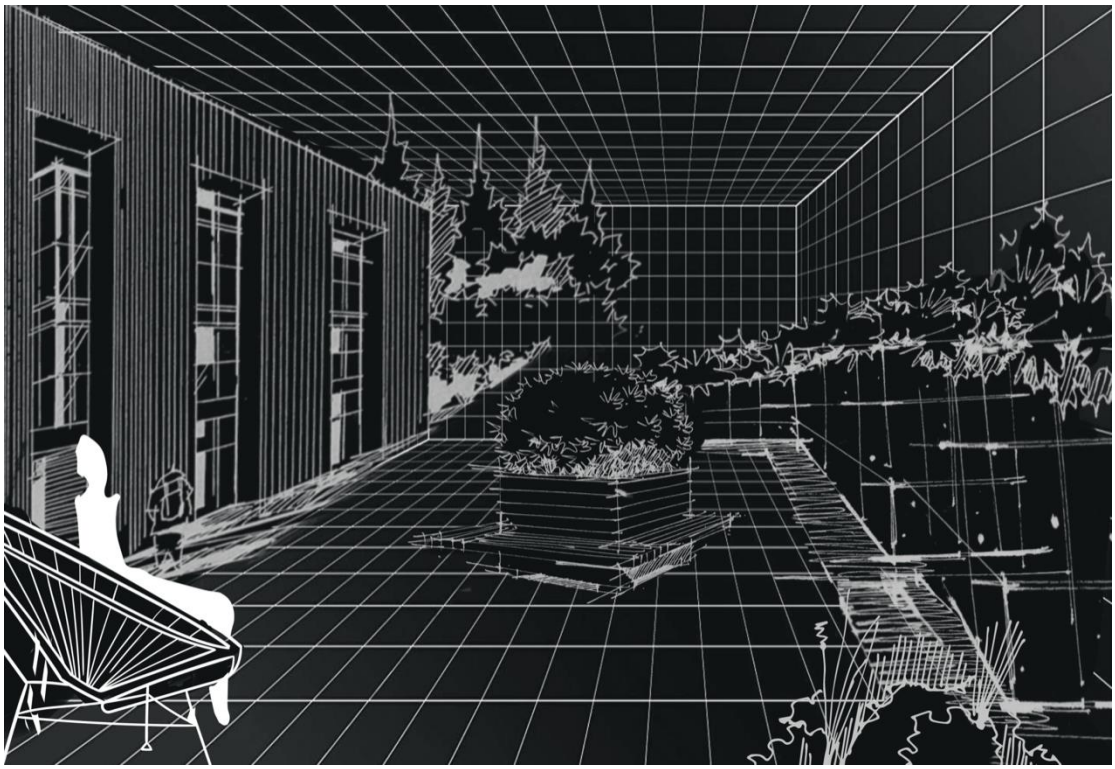


Figure 2. Back office environment analysis diagram.

6. Conclusion

The aim of this project is to enable people to retrace their memories through virtual reality technology, a more comprehensive way of preserving memories, making two-dimensional memories into three-dimensional memories, allowing for a more realistic reproduction of memories, this project adds temperature, sensory, orientation and avoids the incompleteness of text, photos and videos as a means of preservation. Also for can be used in various industries, such as education, because language cannot describe the content; in the medical industry, the use of this product can effectively assist in the treatment of mental illnesses, such as memory loss, Alzheimer's disease and amnesia. This project is not only an effective aid to the treatment of mental illnesses. Another example is the cultural heritage, which is a very effective solution to the problem of passing on a particular technique. The project is also a new way for people to document and share their lives. The project is a new way for people to record and share their lives, to explore the past and to preserve the good things.

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