Development Augmented Reality For Amnesia Illness(DARAI)

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Abstract: Nowadays Augmented Reality (AR) technology are had been used for image recognition technology concept, but it has not been used to treat amnesia illness patient. Based on the traditional treatment of amnesia illness AR presents several advantages to treat amnesia patient image recognition. So, in this research a new alternative treatment will be developing by using marked AR for assisting amnesia patient image recognition. This research has been developed using BuildAR software. By using this AR system 3D image will be seen by the patient based on marked that their seen. From the previous treatment their use mobile phone to make a note to remind the patient about their daily life but this is only in 2D image. Based on the survey distribute out of 50 person 90% will prefer 3D image compare to 2D image. The expected result for this research is the amnesia patient will be able to improve their image recognition. The patient will able to have a good quality of life which is their can make a new memory for a long term life.

Introduction

This Augmented Reality system use for treatment amnesia illness is the first experience using Augmented Reality (AR), but it is not the first experience treating amnesia patients. Till now there are several experiences and groups treating amnesia illness using Occupational therapy**,** Psychotherapy, Medications or supplements and Occupational therapy [1]**.**By using AR that led image recognition system we think it is possible to use AR to treat amnesia patient image recognition. It is because one of amnesia patientssymptoms is inability to recognize places and failure to recognize faces [2]. The use of AR in the treatment of these disorders presents some advantages respect to the traditional treatment and the treatment using VR. In our point of view, the main advantages of AR respect to the traditional method which is that the environment is real and the elements that the patient uses are real as well.

Related Work

An Augmented Reality System for treating psychological disorders: Application to phobia to cockroaches is one of the first researches that use for treatment people that had psychological disorders.This paper presented the first Augmented Reality System for the treatment of phobia to cockroaches. The system has been developed using ARToolkit software. It has been tested with one patient and the results have been very satisfactory. At first of the exposure session the patient was not able to approach to a real cockroach and after the exposure session using Augmented Reality system, the patient was able to approach to a real cockroach, to interact with it and to kill it by herself. This

result is very encouraging and it demonstrates that Augmented Reality exposure is effective for the treatment of this kind of phobias [3].

Figure 1:Application to phobia to cockroaches [3]

Second paper presents the technical characteristics of the firstprototype that uses Augmented Reality to treat acrophobia. Theimmersive photographs are the virtual elements that represent thelocations that the user fears. A total of 36 different immersivephotographs have been included in the system (12 differentlocations with 3 parallel photographs in each location). At first,the system shows the central photograph. If the user rotateshis/her head and stays in the same position, he/she can spin overthe immersive photograph, changing his/her point of view insidethe photograph. If he/she moves to the left/right (i.e. the physicalposition) the photograph will change and the related left/rightphoto will appear [4].

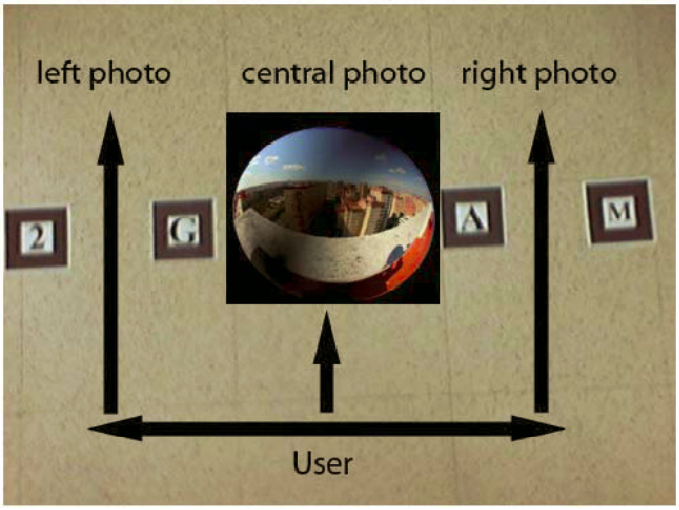

Figure 2: An Augmented Reality system for the treatment of acrophobia [4]

Methodology

The video stream is captured using a USB camera. Augmented Reality Image is shownin LCD display. The camera has been attached to theHMD. ARimage and information detail of (relatives/ close friends) has been developed usingBuildAR software [5]. Thesystem includes the following options:

i- Appearance of (relatives/close friends) picture.When the camera detect the marker. Picture willappearbased on the marker.

ii- Information detail of (relatives/ close friends).Information such name, from where and relationship. It appears below the marker.

iii- Stop information.When the camera don't detect the marker.

Users also can use more than one marker at the same time. Itcan be done usingthree markers with three different designs.Then the marker hasto put on three persons. Theprogram identifies when one of these markers are nearof the personmarker and then it will project information on LCD display. When the user sees the information, it will try to remember eachperson. The therapist chooses inevery experiment how many information have to appear, such as a picture having good time with the relatives or their close friends. All these options are included in order to patient'streatment can be progressive.

PreliminaryResult and Discussion

The system has been tested with a male of 26 years old. He is university student. Before the treatment an admission interview was realised. Through this interview, demographic and clinical information was obtained. During the interview, the patient was also asked about some questions to determine the presence ofdissociative disorders. Regarding the diagnosis,the patient met DSM-5 [6] criteria for specific dissociative disorder. In order to measure the level of anxiety of the patient we have used subjective units of discomfort scale (SUDS) [7]. The participant rated her maximum level of anxiety on a ten-point scale before and after the session. We also used this measure during the exposure session. The exposure session was about 30 minutes and the steps followed were:

1. The patient arrived to a room where there are three strangers personin the room. He did know everyperson in the rooms. He scored 10 on SUDS scale.

2. Before the exposure session, the patient scored10 on SUDS scale. The session withDARAI started. At first, one person information appeared and the patient scored 7 on SUDS scale. After some therapist's instructions, the patient was gradually reducing his level of anxiety. After that, second persons were progressively appearing (Figure 3).During the session, the patient was able to see two persons at the same time.

4. Once the patient scored 0 on SUDS scale, thetherapist remove the marker from the stranger in the rooms.

5. In that moment, the therapist thought the patientwas prepared to give the stranger information.Therapist's hope the patient would be able torecognise the persons that he seen in the rooms. After sometime therapist'sasks the patient about the persons that he saw. Then, the patient was able toremember detail information of the person that he seen.

Figure 3: An Augmented Reality system for the treatment amnesia illness

Conclusion

The conclusions of the exposure session usingARtechnology with one patient are: The system wasable to activate the participant anxiety. He scored 10on SUDS scale at the beginning of the session and hescored 0 after the session. The patient experienced highlevels of anxiety during the AR exposure session. AR exposure was effective for thetreatment of lack of recognition image.Before the exposure session with AR technology, thepatient was not able to know the information detail of the stranger. After this session, the patient was ableto know the information detail of the stranger and can remember it well. This first result is very encouragingbecause it demonstrates that AR exposure is effectivefor the treatment lack of recognition image. So we aregoing to test the system with more patients.This first experience using AR to treat amnesia illness isvery important because it demonstrates that it ispossible to use AR to treat dissociative disorders.This opens a new field where the application of AR ispossible.

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