

Designing an app for screening of possible mental health issues in teenagers, especially in adolescents.

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There are growing concerns about the mental health of young people especially adolescents with phobias and anxiety being reported on rise in recent years. Attempts to integrate conventional therapeutic interventions are faced with challenges of accessibility, engagement, and efficacy. This work describes the design of a virtual reality-based system which is expected to provide an automated potential mental health intervention by integrating the principles of immersive exposure therapy and AI. The system comprises of Virtual Reality therapy, peer-support chat rooms and AI-controlled emotional assessment to adopt the person-centered approach. The platform allows users to gradually increase their intake of levels of fear and anxiety in order to overcome them. The embedding of chatbots and peer-to-peer interaction together with tailored suggestions increases the level of interaction with the service and provides instant assistance. This paper describes technology, approaches, and psychological advantages of the suggested approach.

Introduction

In our fast-paced world, individuals are eager to discover new ways to improve their emotionally-centered therapies, enlisting technologies such as virtual reality. Thanks to VR a shooter can be easily placed in an emotionally stable environment that can help the user face his challenges.

This article intends to create a VR system designed to help users overcome phobias and more general anxiety through exposure therapy. Other functions include Artificial Intelligence term analytics, mood and activity predictions, as well as peer assisted Chat platforms for a more comprehensive mental health approach. The platform seeks to integrate these components with the goal of removing any mental health therapy access barriers that may be encountered by patients by providing a user friendly, creative and easily available solution.

Virtual Reality and Mental Health

Virtual Reality (VR) is hailed as the NEXT BIG THING in the sphere of mental health therapy, since it facilitates such procedures that previously have been thought impossible to have impact. Considered as a conventional tool for the gaming and entertainment industry, VR has so much proceeded as an exciting tool for stimulating environments and allowing people to interact with such certain features for effective therapeutic procedures. Looking specifically at mental disorders, it can be said that patients are exposed to artificial exposure of actual stimuli that are meant to induce anxiety in a secure manner.

The point that is worth mentioning is that the key feature of any VR simulation is the ability to engage the user and facilitate certain emotions that otherwise are impossible to recreate.

This astonishing feature finds meaning especially in the treatment of mental health issues such as phobias where individuals may have to encounter certain scenarios like places with heights, address an audience or confrontation with a group of people that may induce anxiety. In this circumstance, VR allows people to gradually confront these triggers in a more comfortable and damage-free environment. This method referred to VR Exposure Therapy or VRET has been used to successfully assist in the desensitization of patients in relation to their fears and reducing of the symptoms over a certain period. Evidence has also indicated that VRET can produce similar results as the classical exposure techniques, with greater ease of use, more efficient and less invasive. These studies indicate that VRET can produce similar results as traditional exposure therapy but are easier to use and less invasive.

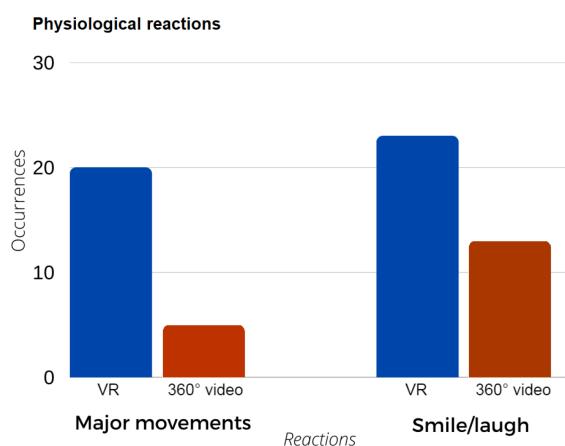


Figure 1: Physiological reactions comparative between VR and 360° videos.

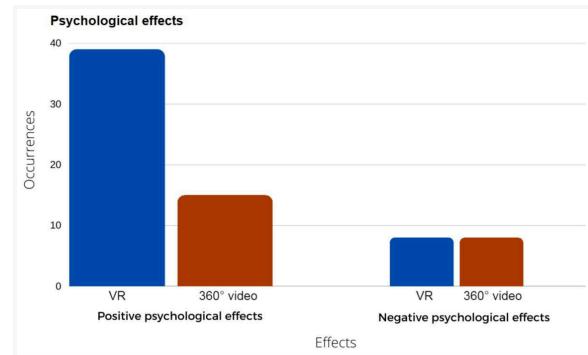


Figure 2: Positive and negative psychological effects occurrences on VR and 360° videos.

Other than exposure therapy, VR has been found to assist in treating other mental issues like anxiety, depression, and PTSD. Calming environments or guided meditative experiences can be rendered through the usage of VR which will allow people to perform mental health management routines in a more effective manner. The fact that users can be very much immersed in a VR experience means greater engagement which can subsequently enhance the success of the therapy provided.

Mental Health and VR Integration

Virtual reality offers a new approach to delivering mental health services that is highly innovative and convenient for providers and patients.

VR platforms have a unique advantage that they afford users with a non-adverse and a discreet way of practicing therapeutic interventions. For those people who have problems trying to get help from a normal therapist because of stigma in society, costs or accessibility, VR can be an additional way of providing assistance.

Furthermore, VR can also allow for customized therapy that is to the patient's needs. The system can even tailor the range of exposure so that the individual can be able to adjust and comfortably undergo a systematic desensitization process. In the case of anxiety for example, VR environments can expose patients to situations which are usually anxiety provoking, such as addressing a large audience or even being in uncomfortable locations enabling the user to train and use coping strategies in such situations.

In terms of combining it with AI analytical features, as it is in the case proposed in this project, VR can become more advanced than a traditional therapy. They could be corrected through monitoring patterns of user interactions and moods throughout the VR experience. Therefore, the system can recommend mental intervention for the user, such as guided imagery or yoga, in order to promote targeted well-being.

To sum up, the combination of virtual reality and mental health therapy is a new, promising and simple approach for treating patients with anxiety, phobias and other mental disorders and may be successfully used in the field with great treatment effectiveness.

Mental Health and VR Integration:

During the recent decade, the integration of VR in the treatment of patients from mental disorders has led to paradigm shifts in the provision of health care services. It also became user-friendly and more accessible than before. A positive aspect of vr based

platforms is that they offer users nondestructive and self-directed accessing to therapeutic instruments. Many people who would otherwise avoid traditional forms of therapy due to the costs associated with it, social stigma or a lack of services, can use VR as a supplementary source of help.

Additionally, it can be tailored for the audience who require therapy. The gradation of exposure to the stimulus can be customized so as to allow users to relax and learn to face their fears step by step. In terms of anxiety for instance, Virtual Reality created the possibility to experience stress-tuning events (such as public speaking or high-density social circumstances) through an immersive environment where users can train their coping strategies.

When combined with AI-based feedback as suggested by the project, VR compliments the conventional therapy by being able to provide a user with feedback on their emotional state in the course of treatment. The system has the additional advantage that it can observe the user's interaction with surroundings through VR enabling it to prescribe behavioral prompts for the individual, including relaxation and mindfulness when necessary, in order to improve their psychological well-being.

The VR-therapy intersection represents a novel, efficient and cost effective model in mental healthcare that has potential to change the treatment outcomes of patients with anxiety, phobias and other mental disorders for the better.

Methodology:

The platform implements three stages of treatment: VR exposure, AI based mood analysis and peer support. First, participants are sequentially desensitized to their fears in staged VR. For instance, participants suffering from stage fright could be taken to a virtual auditorium and made to practice public speaking. Whole stages of discomfort are well managed as users progressively attain higher levels of confidence and lower levels of fears.

Second, AI powered Targeting, Mood and Emotion Analysis uses mood analysis based on user activity within the platform. When users' create voice or textual narratives through chats, the system scans user interactions and tries to ascertain the user's emotion in real time. After identifying the sentiment of the users, the system is capable of suggesting them various options depending upon their moods. For instance, if the users are feeling anxious and stressed, the system advises them to perform some breathing exercises and meditation or suggest a psychiatrist.



Figure 3: Breathing Exercise module in VR Application.



Figure 4: Acrophobia VRET Module in VR.

Last but not the least, the platform has text and audio chat rooms integrated which put users in contact with other users who are going through the same trouble.

Through the peer-support chat rooms, users can interact with other peoples' experiences in a safe manner and provide their emotional support – all these are pertinent factors in the enhancement of mental health.

Technology Used:

In an effort to enhance the quality and effectiveness of the experience, the platform employs a number of advanced technologies. The main technology is Virtual Reality which is animated through the Unity 3D engine that builds environments for exposure therapy that are interactive and realistic. Depending on what the device is able to do, users of the devices will be able to make use of VR headsets like Google Cardboard or Oculus to interact within the environment.

The use of the AI algorithms for the purpose of gaming is pervasive, and it is used to analyze the players' emotions for a particular instance. The algorithms that are used for the analysis of emotions are generated by several machine learning models that interpret audio and text from the

communication provided by the users' chats. The app comes with Google Firebase for cloud storage, a mobile application development platform, to make sure users' data is held and processed within an enclosed system. There is also a facility in the application to include the use of chatbots to provide users that are having emotional issues with self-help, anxiety-reducing exercises.

The integration of Google WebView assisted the application in incorporating chat rooms into the VR interface as it enabled the easy addition of text and audio communication. The users are authenticated and the data is managed by Firebase while the graphic websites are developed with React.

Results and Discussion:

As of today, the first trials of the platform with a small test group have been successful even considering certain flaws have been reported.

Most users indicated that their anxiety levels lowered considerably after they started using the VR exposure therapy feature on a consistent basis. The AI enabled mood detection was also useful in recognizing mood trends hence enabling targeted user engagement. Peer-support chat rooms offered users with community which in turn reduced the feeling of loneliness and stress.

A problem that was faced in the development stage was that the VR environments should not be so engaging that users get overwhelmed but rather engaging enough. Another problem was the AI mood detection algorithms being a bit inaccurate.

Future versions of the platform plan to address these issues in detail by use more sophisticated machine learning models and increasing the diversity of the VR environments.

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