Virtual Reality Headset for Reducing Psychological Burden Of Self-Quarantine Patient Using Artificial Intelligence

T. Sangeetha[1], A. Manimaran [2], S. Parasuraman[2], T. Thilak[3], B. SundaraPandian[4]

[1]Department of Biomedical Engineering, Karpaga Vinayaga College of Engineering and Technology, Chengalpattu, India
[2]Department of Electronics and Communication Engineering, Karpaga Vinayaga College of Engineering and Technology, Chennai 603308, India
[3] Department of Physics, Karpaga Vinayaga College of Engineering and Technology, Madhuranthagam - 603 308, Tamil Nadu, India
[4]Department of Mathematics, Karpaga Vinayaga College of Engineering and Technology, Madhuranthagam - 603 308, Tamil Nadu, India

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ABSTRACT

Personswhoareplacedinquarantinehaveanegativeexperience.Quarantinehasanegative impactonmentalhealth and places a psychological burden on those who are subjectedto it. A device that is worn on the head and enables the user to experience virtual reality is called a virtual reality headset. This research offers a virtual reality headset using artificial intelligence technologies to help self-quarantine patients cope with their psychological burden. Eye tracking sensors, stereoscopic head-mounted display, a head motion tracking sensor and stereo sound are all included in this VRheadset. The emotion sensor is used to place the four walls of achamberwherepatientsarequarantined. It is used to predict the patient's emotions on a second-by-second basis. Emotion sensor inputis transferred to the Raspberry Pi for analysis of their states, such assad or pleased. In addition, when a patient feels alone, we use a voice assistant to acquire their voice. Based on the emotions, the VR head set will automatically play a video, audio, or display visuals thatwe have already saved in the patient's preference history. The patientwill feel more relaxed and their stress will be lessened as a result of using this VR head set. It will assist the patient in reducing psychological stress during the quarantine period.

Keywords: VR Headset, Emotion-sensing sensors, Raspberry Pi, Artificial Intelligence, Voice assistant

I. INTRODUCTION

Theterm"virtualreality"describesasophisticateduserinterface that combines real-time stimulation and interactivity with different sensory channels. Itentails experiencing an imagined world as opposed to the real one. Every area of people's life has been influenced by the coronavirus disease 2019 (COVID-19) pandemic, including how we work, play, learn, exercise, and socialize. As the pandemic has the potential to worsen many problems, virtual reality (VR) technology has seen a surge in popularity. However, the ability of VR to successfully solve COVID-19 challenges is currently constrained by very low overall usage and limited software. This study looks at how diverse VR usage, gratifications, and device ownership / variability may be influenced by perceived COVID-19 effects. We also look into how social interaction in virtual reality might influence adoption intentions.

Forinstance,viewingastunningCANALETTOpaintingallowsyoutovirtuallyexperiencethesights,sounds,andatmosphereofItalyaround250yearsago.Usersaretransportedinto3Dsettingswheretheycanfreelyroamaboutandengageinactivitiestocompletetasksandaccomplishgoals.Virtualrealityisactuallyabrand-newplatformforcommunicationthatallowsustoshareunrestrictedenvironmentsandexperienceswiththepeo

pleinourlives [1-5].Arenderingcomputerredrawsthevirtualworldtoreflecttheactualmovementsthat are tracked inthe realworld.Living in the COVID-19 era involves dealing with not justbodily problems but also emotional and psychological stress.Quarantinedindividualsencounterundesirableoutcomes.Based on the protocol 360^0 video camera, which promotes anatural setting to encourage relaxation and introspection, thiswas created. The number of individuals affected by physicalhealthduringCOVID-19islowerthanthenumberofindividualsaffectedbymentalstress [6-12].

Virtualrealityheadsetisadevicewornontheheadthatimmersesvirtualreality forthewearer. This researchoffersthevirtualrealityheadsetusingartificial intelligence technology to help self-quarantine patientscope with their psychological burdens. They include stereoscopicheadmounteddisplay,eyetrackingsensor, stereosound,andheadmotiontrackingsensors.Virtualworld,immersion, sensory feedback, and interactivity are the fourbasic key components. Placing a small computer display infront of the eye is a typical method for creating a realistic 3Dpictureofavirtualworld [13-15].Everymonitorreproducestheviewpoint that the matching eye would experience in a real-worldsetting.Theterm"binocularhead-mounteddisplay"referstosuchasetup(HMD).Forthosewhoarepsychologically impacted, this virtual reality headgear mightbe useful. For example: A mother who lost her only girl childtwo days before, she was not mentally prepared to accept thedeath of her child. Her neighbours made the virtual realityheadset to make her happy and feel the presence of her babygirl [15-21].The United States Military Services have used virtual reality headgear. It is especially useful for training military troops without putting them in danger. The virtual reality headset allows military soldiers to engage with virtual reality people, making the experience more realistic. People can communicate with one another and perform various acts in the virtual reality world to make it appear as if they are actually in that circumstance. When military people utilise the headset, there are both advantages and disadvantages. The disadvantage is that the headset is designed for use indoors, in a cool atmosphere, and away from heat, so when military people wear only the headset and no military equipment, it is not the same as their basic training. because no military equipment is required to recreate the situations several times, and the expense of owning the headset is low.

VR HEADSET:

Figure 1. VR Headset

At MIT in the middle of the 1960s, virtual reality therapy for mental health problems was first developed. Post-traumatic stress disorder (PTSD) and a fear of spiders have both been treated using this therapy approach. In order to address anxiety disorders connected to phobias of flying, public speaking, and heights, the Duke University Virtual Reality Therapy Program uses VR content. Quarantine is a bad experience for the people who are there. The psychological toll that quarantine has on its victims and those who are subjected to it is detrimental to both. A headset for virtual reality is a device worn on the head that completely immerses the user in the virtual world. This study proposes a virtual reality headset

that makes use of artificial intelligence technology to assist patients in self-quarantine in managing their psychological burden. This VR headset has stereo sound, stereoscopic head-mounted display, a head motion tracking sensor, and eye tracking sensors.The location of a chamber's four walls, where patients are isolated, is determined by the emotion sensor. It is used to anticipate the patient's feelings second by second. VR headset is shown in Figure 1. The Raspberry Pi receives data from emotion sensors to analyse emotions like happiness or sadness. Also, we use a voice assistant to record a patient's voice when they feel alone. The VR headset will automatically play a film, play audio, or show images based on the patient's emotions that we have previously saved in their preference history. The patient will benefit from utilizing this VR headset by feeling more at ease and having less stress. It will help the patient during the quarantine period to lessen psychological stress.

II. LITERATURESURVEY

The name “Virtual reality” was first used in 1980 by JaronLanier, founder of VPL Research, began to develop the glovesandgogglesneeded toexperiencetheterm“virtualreality”.Laura Freina, Michela Ott proposed the Immersive virtualreality in education. The first builds on the idea by simulating locations in the real or made-up worlds in their paper; The second expands on it by creating the illusion of being physically present in the fictitious world.Immersive VR is still in its infancy as the required hardware continues to advance in usability and cost, although non-immersive VR may be powered by a standard PC. It used to be quite challenging to utilize equipment like a helmet with goggles, but new technology is being developed to make it easier for users to use. Since it might make studying more engaging and motivating, virtual reality has a lot of potential in the educational sector. Immersion, interactivity, and user participation with the environment and story are the three underlying elements of virtual reality (VR). Immersive-VR has only recently been employed in educational games due to the expensive nature of the hardware and its limited applicability. Researchers have been developing technologies. These programmes provide the user with a visual experience akin to virtual reality or hybrid reality.On the Head Mounted Display (HMD) screen, the rendered graphics are updated in response to the user's motions. Currently available HMDs are big and connected to the user's PC, which runs the software. Both a graphics processing unit and a CPU with high computational skills are required for these systems.

Dmitry Pavlov proposed virtual reality in monitoring. In thispiece,wetakealookatacasestudyofhowvirtualandaugmented reality (VR/AR) can be used to convey analytics toproduction equipment personnel in an efficient manner. Thereference analytical services for our study were developed aspart of a pilot project with the Russian metal cutting industry.Two service models are suggested: Situation Center (model a)andVirtualAssistant(modelb).WelistthebenefitsofVRandARabovetheconventionalmethodofvisualizinganalytical services on computer screens. Our investigation isaccompanied by a prototype VR/AR system implementationforthedistribution of analyticsto the staff.DorotaKaminskaproposedvirtualrealityinmechatronics.Numerous studies show that using virtual reality as a trainingtool in a variety of fields, including development, the military, healthcareand education, can be successful. This essay willsuggestaninteractivetrainingmethodformechatronicsinstruction.Thesoftware'sinterfaceisstraightforward initsprototype, making it simple to understand and operate. A 3Dobject that has to be examined and researched can also bevirtuallymovedbytheuserusingtheprototype'smaincomponent. According to preliminary research, the gadget canhelp boost the effectiveness and quality of higher education, aswell as graduates' qualifications, competencies, and abilities,and makethemmorecompetitive in the jobmarket [22]

DanielleSchnebelenproposedLiteratureasVirtualReality:AnExplorationofSubjectivityFormationinthe Digital Era. Their project follows the evolution of subjectivitythroughout the history of mediation. They contend that literaryvirtualrealitiescontributetoourunderstandingofhuman-technologyinteractionsbyhighlightingtheconnectionbetweensocialidentityandself-

formationusingJacqueLacan'smirrorstage.Analyzingthedevelopmentofsympathetic consciousness in the eighteenthandnineteenthcenturiesrevealsasubjectivityinextricablytiedtobothcognitive and physical locations. This consciousness is mademore difficult by the emergence of the virtual body, whichobscuresmaterialityandcombineshumansandmachines.ThisprojectexaminesthewritingofCharlieBroker,amodern television writer, Virginia Woolf, and Jane Austen totrackthisconsciousness.Bydisruptingself-possessioninvirtual environments, these authors help new subjectivities toarise.Thisresearchaddressesconcernsaboutadevelopingdigitalsubjectivityinlightofexpandingtechnologiesandglobalization [23].

A Systematic Literature Review on Virtual Reality for Learning was offered by Candra Kurniawan. Learning can be done in a variety of ways and with a variety of tools. This paper covers both new and earlier research to understand the use of virtual reality technology for learning. In this paper, a systematic review of the literature (SLR) was used as the approach. The first phase involved deciding on theresearch question (RQ). From previously constructed RQ, thequery for looking up prior research in well-known databasejournalswasgenerated.IEEEXplore,ScienceDirect,SpringerLink, Scopus, and ACM Digital Library were amongthewell-likedperiodicals.Thesearchyielded32similararticles, which were then examined. The study found that thereare four reasons forutilizing virtual reality for learning, aswellastwo differenttypesofequipmentand userexperiences.KundalakesiMathivananproposed A Study of Virtual Reality.Virtual reality (VR) is a potent and engaging technology thattransformsourlivesinunimaginableways.Virtualreality,oftenknownasimmersivemultimedia,isthepracticeofcreating a sense of physical presence for the audience in bothreal and made-up settings. Usually, it affects the sight and thehearing. "Presence" is the main characteristic that set VR apartfromallotherpreviousmediaformats.Thepsychologicalsensationof"beingthere"—oftrulybeingenmeshedandsurrounded by the surroundings—is called presence. With afocus on live VR experiences, this debate aims to provide anoverviewofthepresentstateofenvironment-relatedVR [24].

Veronica S provided a model to decide when to use virtual reality as well as Reasons to Use Virtual Reality in Education and Training Courses. Numerous studies have been conducted on the use of virtual reality in education and training. This article offers a case study of one such investigation. Applications for virtual reality are discussed.The advantages and disadvantages of virtual reality are examined, along with suggestions for when to use and when not to use it. In order to determine when virtual reality should be employed in a training or educational setting, a model is provided. Virtual reality presents fresh formats and methods for visualisation by utilising the advantages of visual representations. It provides a different strategy for material display. Virtual reality (VR) can sometimes depict certain features, processes, and the like more accurately than when using other techniques, allowing for up-close inspection of an object, observation from a great distance, as well as the observation and examination of areas and events that cannot be seen using other techniques [25]. Virtual Reality in the Military: Present and Future was a proposal made by R.T. Haar. This essay summarises virtual reality in its present and potential future. It highlights a few contemporary military applications and demonstrates the many categories into which they fall. It also exemplifies the developments being made in virtual reality technology for the defence industry. In light of these developments, the research's current focus and future potential are illustrated [26].

Ryan Yung, Catheryn Khoo-Lattimore proposed virtual realityin tourism. Their research aims to empirically examine theviabilityofVRasatoolfordestinationmarketing,theoretically supported by the idea of presence and its impacton feelings and intentions. To compare the efficacy of VR,movies,andimagesforcruiseshipmarketing,awithin-subjects experiment is used. The findings show that VR couldbeamoreeffectivemarketingtoolandofferinformationonthe effects of important presence variables. Future researchdirectionsand theirpracticalramificationsarealsocovered.Kyle E. Haggard

proposed virtual reality in construction. Inrelation to BN Builder's Spectrum/Vertex project, this casestudy discusses the objectives, advantages, and difficulties ofusing virtual reality in building. The interviewees' commentsweregatheredand discussed inthe following paragraphs dueto the nascent state of the technology. In order to compile thedata for this case study, phone interviews with field and officestafffromBNBuilders,thevicepresidentofVertexPharmaceuticals (the company that will inhabit the building),and the project's architect were conducted. According to thecase study's conclusions, BN Builders was able to spot designfaultsandmakefinancialandtime-savingadjustments [27].

III. PROPOSEDMETHOD

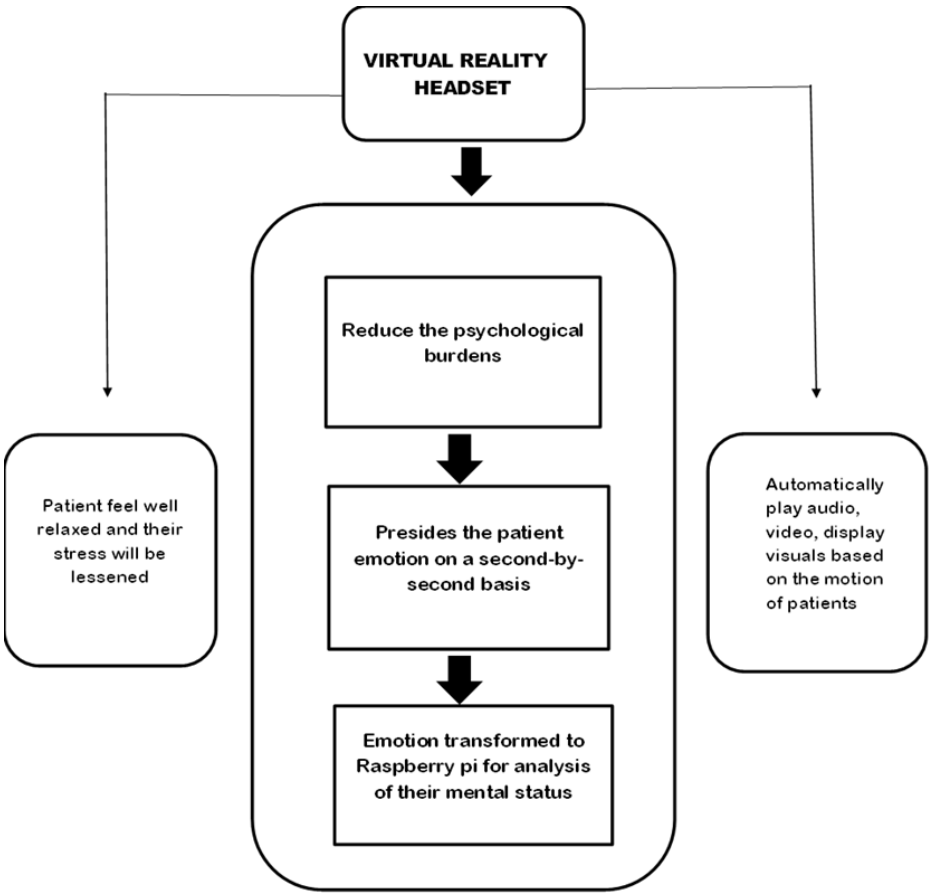

Figure 1. System Designof Virtual Reality

Waqqas-ur-Rehman Butt Virtual Reality: A Study and Analysis of Its Impact on the Present Era.Currently,nothingis known about how VR will affect users in the real world.Therefore, it's critical to understand both the potential benefitsanddrawbacksofemployingthistechnologyforusers.Inordertobettergrasptheconceptanditsconsequences in various industries, this paper first proposes aframework. Built using already published research, it looks attheVRexperiencesthatareavailableaswellasVRuserinvolvementbasedonposition,location,andinteractivity.Previous research has revealed a range of responses from VRusers in various contexts, which needs to be further examined.They conclude this paper in this framework by analyzing fivedistincttopics.Figure 1 depicts the system design of virtual reality headset. Virtual reality (VR) is a type of simulation that can be either similar to or very different from the real world. Virtual reality has

uses in commerce, instruction, and entertainment. In addition to virtual reality, additional types of technology include augmented reality and mixed reality, also referred to as extended reality or XR, but definitions are still changing as the area matures. Quarantined individuals experience harmful effects. The effects of quarantine are detrimental to mental health and burdensome to people who are subjected to them psychologically. A headset for virtual reality is a device worn on the head that completely immerses the user in the virtual world. Figure 1 shows a system design of proposed work.

This study suggests a virtual reality headset that uses artificial intelligence to assist patients in self-quarantining their psychological burden. This VR headset features stereo sound, stereoscopic head-mounted display, head motion tracking, and eye tracking sensors. The four walls of a chamber where patients are isolated are placed using an emotion sensor. It is used to anticipate the patient's feelings second by second. The Raspberry Pi receives data from emotion sensors to analyses emotions like happiness or sadness. The viewing system, tracking system, interactive element, and creative inclination are the primary elements of a VR headset. Additionally, we use a voice assistant to record a patient's voice when they feel alone [28-30]. The VR headset will automatically play a film, play audio, or show images based on the patient's emotions that we have previously saved in their preference history. The use of this VR headset will make the patient feel less stressed and more relaxed. It will help the patient cope more easily with the psychological strain of the quarantine.

HARDWARE DESIGN

According to research, the user's head cannot move at a maximum angular velocity or linear acceleration of more than 230 degrees per second and 2 grammes while not in mid-air, respectively. The design makes use of MPU6050 as the IMU. It is designed to measure a linear acceleration of 2g and an angular velocity of 250 deg/s. The MPU6050's Digital Motion CPU (DMP) lessens the computational demands placed on the system's primary processor. The hardware platforms used for computations were Raspberry Pi and Arduino. These are compact form factor computers that meet our needs and have a respectable level of computation power. The processed data is displayed on the VR headset's screen. A set of lenses is used for accurate screen rendering imagery. Figure 1 shows a tracking device that monitors the user's head movement [31-32][35-37].The sensor data consists of the coordinates of the user's orientation. This data is fed into the processing unit, which generates the real-time visuals displayed. The resulting images are then displayed on the screen, producing stereographic effects. The hardware design is depicted in Figure 2.

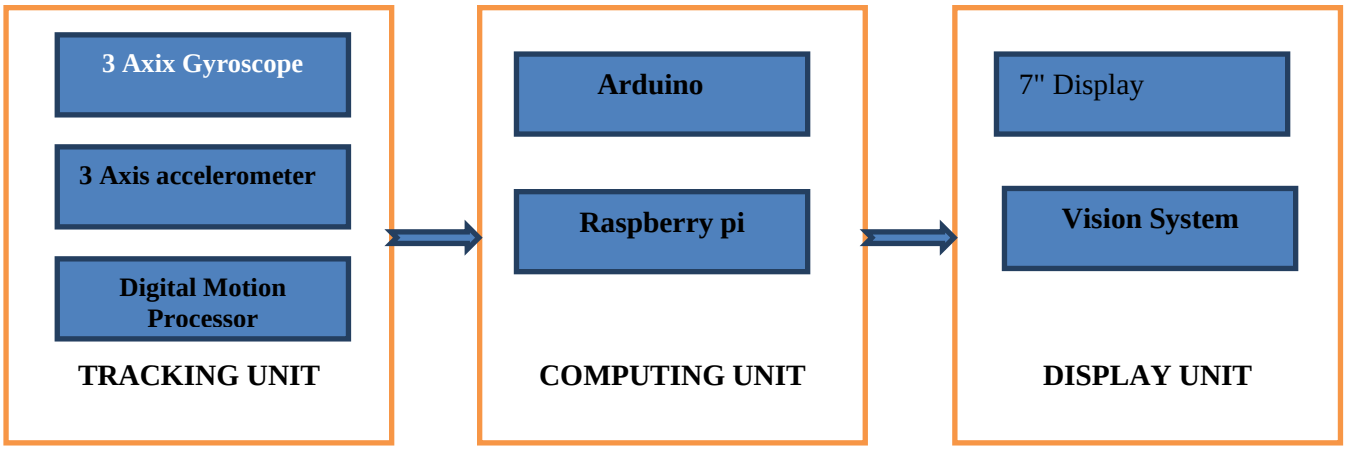

Figure 2– HARDWARD DESIGN

MPU6050:

With a DMP, 3-axis accelerometer, and 3-axis gyroscope, the motion tracking unit MPU6050 includes all three. Sensor fusion technology and the sensors enable real-time motion tracking. The sensor board has dimensions of 4 mm x 4 mm by 0.9 mm. The 16-bit analog-to-digital converters (ADCs) in the MPU6050 digitise the data that the accelerometer and gyroscope provide. This device can be programmed to meet these requirements. The MPU6050 operates in the 2.375 V to 3.46 V voltage range, and it communicates with the host microcontroller via the I2C interface.

ARDUINO:

Arduino is a hardware platform that is open-source. It has an ATmega328 microprocessor with an 8-bit resolution and a 16 MHz clock rate. For this module to operate, the DC power connection on the board allows input voltage ranging from 7 to 12 volts. It can also be powered by the USB port on the board. The IMU sends data to the I2C bus.The processed data is sent via serial bus to the Raspberry Pi's central processor unit (USB).The MPU6050 is ideal for rapid prototyping because it is supported by robust libraries on the Arduino platform.

RASPBERRY PI:

The Raspberry Pi 2 is a credit card-sized single-board computer. We used a Raspberry Pi 2 Model B for our analysis.The Broadcom BCM2836 CPU powers the Raspberry Pi in this edition.It has 1 GB of RAM that is shared with the GPU and an ARM Cortex A7 CPU with a clock speed of 900 MHz. It has an HDMI connector and can connect to a display device with a resolution of 1900 by 1200 pixels.It is also possible to connect a microSD card containing the operating system to the board.The computer measures approximately 90 mm by 60 mm and weighs approximately 45 g.The device has a power rating of 5V-1A. Raspbian, a Linux-based operating system, is what's on the device.

DISPLAY UNIT:

The screen must completely enclose the user's field of vision, which is one of the design requirements for effective image visualisation.When placed between four and five centimetres from the eyes, a seven-inch screen covers the majority of the user's field of vision.We use an Adafruit 7" HDMI and power input display in our design. The device's driver is hidden behind the screen. As a result, the system is small. The 800 x 480-pixel resolution of this screen allows for VR use. The peak current rating for this display is 600 mA, but it can be reduced further by adjusting the brightness of the backlight.

LENS AND CASING:

The design made use of bi-convex lenses with a focal length of 40 mm. When placed close to the eyes, the diameter of the lenses is sufficient to cover the user's field of vision.The device's case is designed to house all of the mechanical and electrical components. It was designed and fabricated in-house using acrylic sheets. It has lenses and a screen that are positioned correctly to focus and enclose the user's field of vision.Because of careful design considerations, no part of the casing blocks the display[33-36]. Figure 3 shows a block diagram for software design of proposed system.

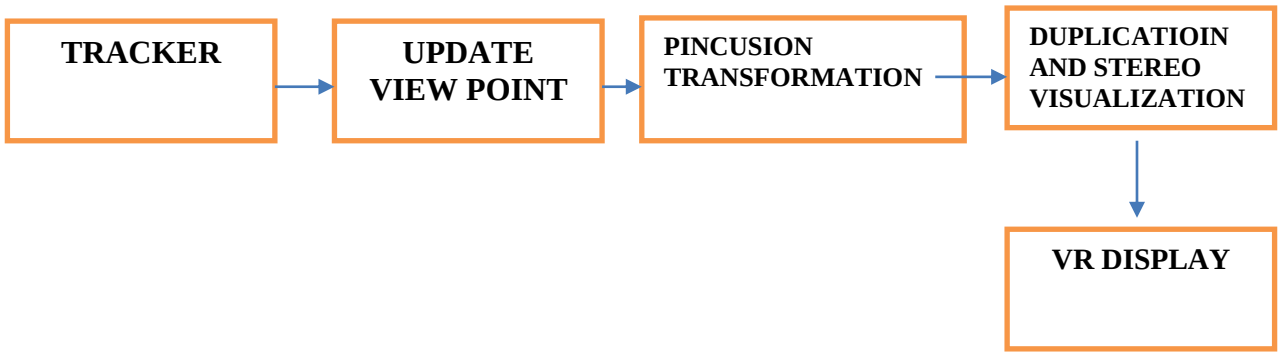

Figure 3 SOFTWARE DESIGN

TRACKER:

The MPU6050 sensor's data is interpreted by software running on an Arduino. Values from the sensor are kept in a 1024 bytes FIFO buffer inside of it as they are acquired. Arduino receives an interrupt when the buffer is filled, after which it reads the data from the buffer. The correct yaw, pitch, and roll values are created from the raw data and applied during rendering.

VIEW PORT UPDATE:

viewport, or area of the screen where the image appears, is rectangular [14]. The viewport is updated as soon as the tracker's coordinates are updated, as shown in figure 4.

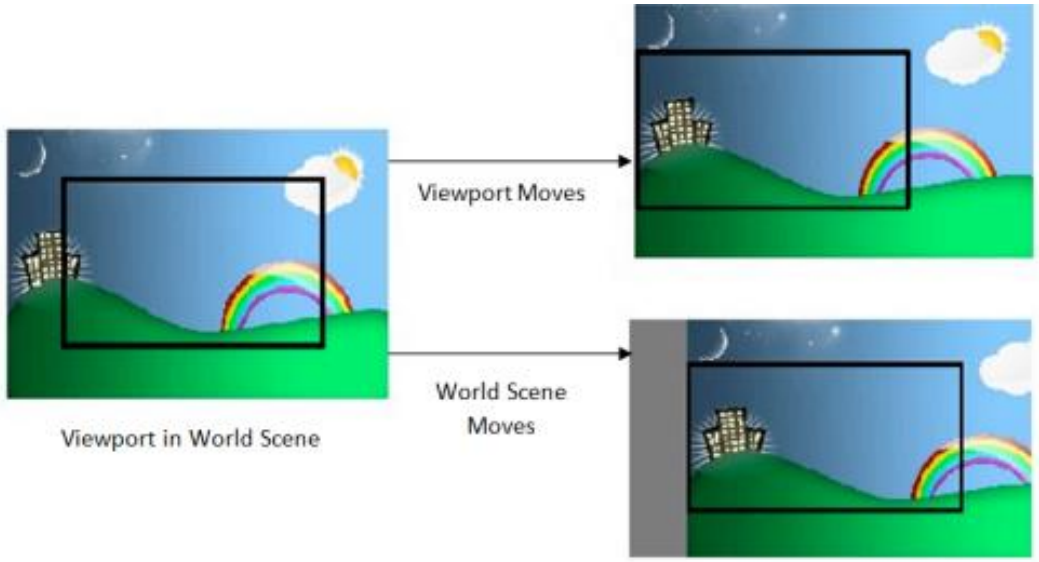

Figure4. Result of the camera or tracker moment

Assume that a virtual camera exists in a virtual environment, and that the tracker is used to control the camera's motion. In other words, the tracker is mimicked by the virtual camera. If the tracker is now

spun clockwise, the scene rotates counter clockwise with respect to the tracker or virtual camera. Since the entire picture is static, the virtual camera must be rotated clockwise to reflect the shift.

PINCUSHION TRANSFORMATION:

The distance between the HMD's screen and the eyes is kept to a minimum (around 4-5 cm). With this separation, the user won't be able to concentrate on the image. So, a set of lenses is employed. The pincushion distortion in the image caused by the user's usage of the lens to focus on the display is quite clear to the user. Pin-cushion transformation, also known as barrel distortion, is used to remove this distortion before the image is displayed on the screen which is shown in Figure 5.

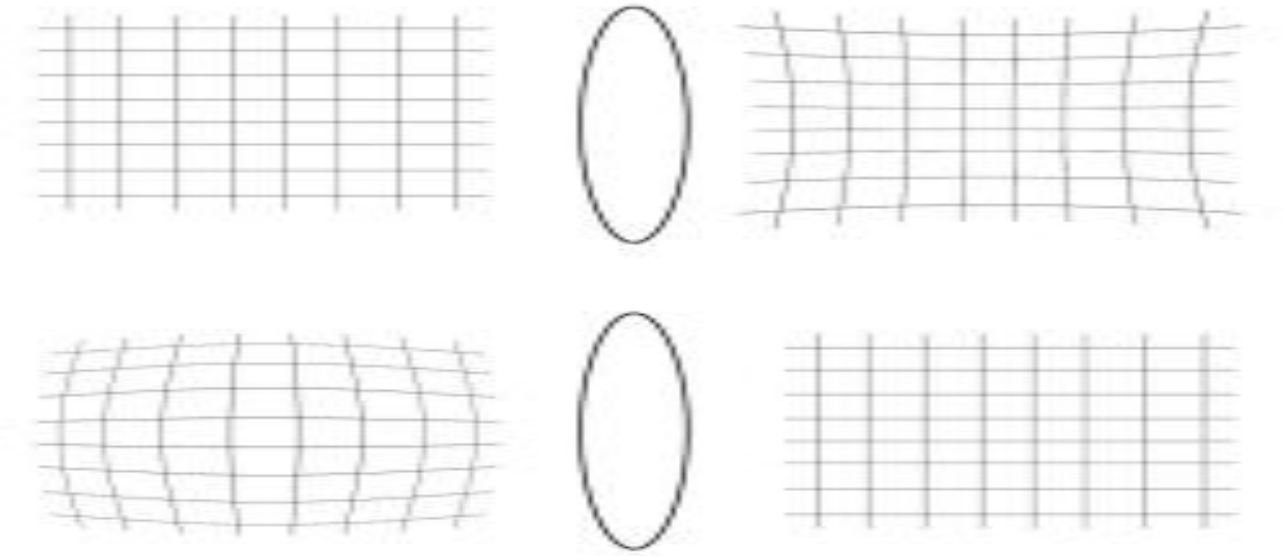

Figure 5. Distortion and correction caused by lens

DUPLICATION AND STEREO VISUALIZATIONS:

There is just one image left on the screen once the pincushion modification is applied. For each eye, we must have a different image, though. The image is copied and shown on the screen side by side to achieve this[37-40]. Through the lenses, the user does not see these images as a single image. The two duplicate images begin superimposing on one another after the screen's distance between them has been adjusted based on the user's Interpupillary Distance (IPD). Through the lenses, this produces a visualisation of a single image. Even this image, though, is flat and without any sense of depth. We render the scene from two sources in order to incorporate detailed information in the scene.

IV EXPERIMENTAL RESULT

INPUT – QUARENTINE PATIENTS:

The isolation that comes with the COVID-19 sickness during a pandemic and its complexity provide significant issues. Many of the patients on this ward were hospitalized for longer than three months in accordance with New York State Department of Health standards, and between late March and

late June 2020, visitors were basically forbidden from entering the facility. Isolation, confinement, and a lack of variety in the patients' environs and lives were all significant psychosocial problems throughout the epidemic. Virtual reality was a kind of escape for some study participants while it was a coping tool for others. VR can be used to offer experiences that would not otherwise be available.

Figure 6: Self quarantine patient with psychological stress

Significant problems are caused by the isolation that comes with the COVID-19 illness during a pandemic and by its intricacy. According to New York State Department of Health requirements, several of the patients on this ward were kept in the hospital for longer than three months, and from late March to late June 2020, visitors were essentially prohibited from entering the facility. Throughout the outbreak, the patients' environments and lives were monotonous, confined, and isolated, which posed serious psychosocial issues. For some study participants, virtual reality served as a form of escape, but it served as a coping mechanism for others. Experiences that would not otherwise be available can be provided through VR.

USED SENSORS FOR PREDICTING EMOTIONS:

An inertial measurement unit (IMU), which can comprise an accelerometer, gyroscope, and magnetometer, is used in a basic VR system. We used sensors for predicting emotions. Table 1. Shows emotion recognition and evaluation using ECG.

TABLE 1 Emotion recognition and evaluation using ECG.

Aim	**Emotions**	**Methods**	**Hardware and Software**
Research focuses on recognising emotions in living spaces for service robots.	High/neutral/low valence. Negative arousal categorized into: sadness, anger, disgust, and fear	**ECG**	Wireless bio sensor RF-ECG
This study recommends using ensemble learning to create a machine learning model that can identify the four main	Anger; sadness; joy; and pleasure	**ECG**	Spiker-Shield Heart and Brain sensor

Aim	Emotions	Methods	Hardware and Software
human emotions.			
A new framework for assessing interactive entertainment technology has been developed.	Level of arousal	**ECG**, galvanic skin response (GSR), electromyography of the face, heart rate	Digital camera, ProComp Infiniti system and sensors, BioGraph Software from Thought Technologies.
Novel AfC methodology that can identify a subject's emotional state is presented.	High/low valence and arousal	**ECG**, EEG	B-Alert X10 sensor (Advanced Brain Monitoring, Inc., USA)
Suggested new technique for automatic feature extraction and P-QRS-T wave localization	Joy and sadness	**ECG**	BIOPAC System MP1

Table.2 Descriptive Analysis of VR Uses & Gratifications

VR Uses & Gratifications	% (N)
Education	37.8 (111)
Tour	38.3 (117)
Game	62.4 (192)
Movie	51.3(160)
Socializing	14.1 (72)
Work	43.4(137)
Mental Health	26.7 (74)
Physical Health	19.2 (56)
Telemedicine	10.3(27)

Table 2. shows the percentages of various types of VR uses.The leading use was gaming (62.4%), followed by movie-watching (51.3%) and work (43.4%). Approximately 43% of participants reported using VR for tourism (89.3%) and education (37.8%). Regarding other types of uses and gratifications, 26.7% of participants used VR for socializing, 26% used VR for mental health, and 19.2% used it for physical health.

USED HISTORY OF PATIENTS IN 360 DEGREE VIDEO FORMAT:

Here we collect the history of patients that is the happy days, cheerful videos, exciting videos,

emotionally connected videos etc.. When the patient fells the stress, anxiety, guilt or some psychological stress by using the emotional sensor it will automatically play the 360-degree video related to their mood swings. By this automatic play of video, they can feel more relaxed and sometimes they may be happy to see those videos.

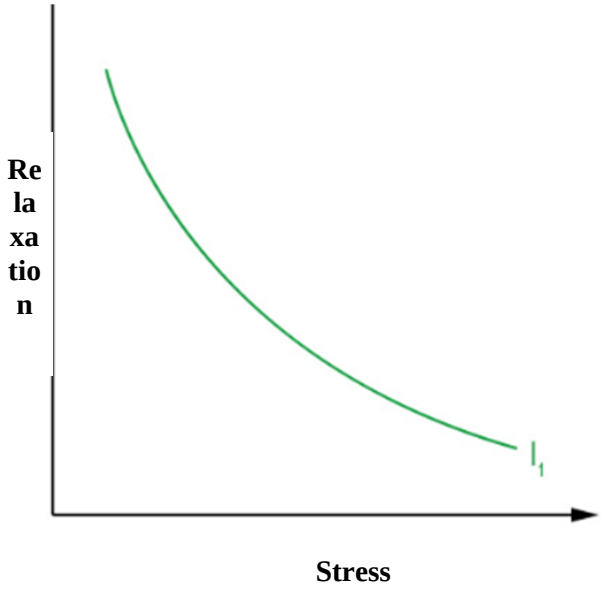

Figure 7. relationship between the stress and the relaxation while using VR

CONCLUSION

Self-quarantine isolates and limits the mobility of people who have been exposed to an infectious disease in order to see if they become ill. Quarantine is frequently an unpleasant experience for individuals who are subjected to it. Quarantine has a negative influence on mental health and creates a psychological burden. In this project reduces a Psychological Burden of Self-Quarantine Patient by using VR Headset with Artificial Intelligence based technology. It comprises VR headset with Artificial Intelligencetechnology for improving health of self-Quarantine patient. It is mainly used to reduce the Psychological Burden of Self-Quarantine Patient. As a result, it will improve mental health of those who are feeling Psychological Burden during self-Quarantine and Self- Quarantine people will get relief and feel better when they will use VR headset.

REFERENCES

1. Ahmadpour N., Randall H., Choksi H., Gao A., Vaughan C., Poronnik P. Virtual Reality interventions for acute and chronic pain management. Int. J. Biochem. Cell Biol. 2019; 114:105568.
2. Balzarotti S., Piccini L., Andreoni G., Ciceri R. “I know that you know how I feel”: behavioral and physiological signals demonstrate emotional attunement while interacting with a computer simulating emotional intelligence. J. Nonverbal Behav. 2014; 38:283–299.
3. Benbow A.A., Anderson P.L. A meta-analytic examination of attrition in virtual reality exposure therapy for anxiety disorders. J. Anxiety Disord. 2019; 61:18–26.
4. Bordnick P.S., Graap K.M., Copp H.L., Brooks J., Ferrer M. Virtual reality cue reactivity assessment in cigarette smokers. Cyberpsychol. Behav. 2005; 8:487–492.

5. Bordnick P.S., Traylor A., Copp H.L., Graap K.M., Carter B., Ferrer M., Walton A.P. Assessing reactivity to virtual reality alcohol-based cues. Addict. Behav. 2008; 33:743–756.
6. Cesa G.L., Manzoni G.M., Bacchetta M., Castelnuovo G., Conti S., Gaggioli A., Mantovani F., Molinari E., Cardenas-Lopez G., Riva G. Virtual reality for enhancing the cognitive behavioral treatment of obesity with binge eating disorder: randomized controlled study with one-year follow-up. J. Med. Internet Res. 2013;15: e113.
7. Dunn J., Yeo E., Moghaddampour P., Chau B., Humbert S. Virtual and augmented reality in the treatment of phantom limb pain: a literature review. NeuroRehabilitation. 2017; 40:595–601.
8. Chan E., Foster S., Sambell R., Leong P. Clinical efficacy of virtual reality for acute procedural pain management: a systematic review and meta-analysis. PLoS One. 2018;13: e0200987.
9. Norr AM, Smolenski DJ, Reger GM. Effects of prolonged exposure and virtual reality exposure on suicidal ideation in active-duty soldiers: an examination of potential mechanisms. J Psychiatr Res (2018) 103:69–74.
10. Ferrer-Garcia M., Gutierrez-Maldonado J. Effect of the mood produced by virtual reality exposure on body image disturbances. Stud. Health Technol. Inf. 2010; 154:44–49.
11. Fernandez J.A., Maes P., Richer A.F.R. vol. 17. 2019. Deep reality: an underwater VR experience to promote relaxation by unconscious Hr, Eda, and brain activity biofeedback. (ACM SIGGRAPH 2019 Virtual, Augmented, and Mixed Reality). ACM.
12. Fernández-Álvarez J., DI Lernia D., Riva G. In: Anxiety Disorders: Rethinking and Understanding Recent Discoveries. Kim Y.-K., editor. Springer Singapore; Singapore: 2020. Virtual reality for anxiety disorders: rethinking a field in expansion.
13. Fernández-Sotos P., Fernández-Caballero A., Rodriguez-Jimenez R. Virtual reality for psychosocial remediation in schizophrenia: a systematic review. Eur. J. Psychiatr. 2020; 34:1–10.
14. Freeman D., Haselton P., Freeman J., Spanlang B., Kishore S., Albery E., Denne M., Brown P., Slater M., Nickless A. Automated psychological therapy using immersive virtual reality for treatment of fear of heights: a single-blind, parallel-group, randomised controlled trial. Lancet Psychiatr. 2018; 5:625–632.
15. Norrholm SD, Jovanovic T, Gerardi M, Breazeale KG, Price M, Davis M, et al. Baseline psychophysiological and cortisol reactivity as a predictor of PTSD treatment outcome in virtual reality exposure therapy. Behav Res Ther (2016) 82:28–37. doi: 10.1016/j.brat.2016.05.002.
16. Son JH, Lee SH, Seok JW, Kee BS, Lee HW, Kim HJ, et al. Virtual reality therapy for the treatment of alcohol dependence: a preliminary investigation with positron emission tomography/computerized tomography. J Stud Alcohol Drugs (2015) 76:620–7. doi: 10.15288/jsad.2015.76.620.
17. Mclay RN, Graap K, Spira J, Perlman K, Johnston S, Rothbaum BO, et al. Development and testing of virtual reality exposure therapy for post-traumatic stress disorder in active-duty service members who served in Iraq and Afghanistan. Mil Med (2012) 177:635–42.
18. Park KM, Ku J, Choi SH, Jang HJ, Park JY, Kim SI, et al. A virtual reality application in role-plays of social skills training for schizophrenia: a randomized, controlled trial. Psychiatry Res (2011) 189:166–72.
19. t-Jacques J, Bouchard S, Belanger C. Is virtual reality effective to motivate and raise interest in phobic children toward therapy? A clinical trial study of in vivo with in virtuo versus in vivo only treatment exposure. J Clin Psychiatry (2010) 71:924–31.
20. Walshe DG, Lewis EJ, Kim SI, O'sullivan K, Wiederhold BK. Exploring the use of computer games and virtual reality in exposure therapy for fear of driving following a motor vehicle accident. CyberpsycholBehav (2003) 6:329–34.

21. Rothbaum BO, Hodges L, Alarcon R, Ready D, Shahar F, Graap K, et al. Virtual reality exposure therapy for PTSD Vietnam Veterans: a case study. J Trauma Stress (1999) 12:263–71.
22. Dmitry Pavlov et.al, “Case Study of Using Virtual and Augmented Reality inIndustrialSystemMonitoring,Proceedings of the 26th conference on fruct association, vol.7,pp.155504–155512,2019.
23. Jessica Danielle Schnebelen et.al, “Literature as Virtual Reality: An Explorationof Subjectivity Formation in the Digital Era, an Eco-Jungian Approach to‘Always-on’ Culture.” International Journal of Jungian Studies, 6:2, 120-132.Web.13April2015.
24. Candra Kurniawan et.al,”A Systematic Literature Review on Virtual Reality forLearning”, Conference: 2019 IEEE 5th International Conference on Wirelessand Telematics (ICWT).July2019.
25. Veronica S, “Reasons to Use Virtual Reality in Education and TrainingCourses”,ThemesinScienceandTechnologyEducationVolume2,Number1, 2009 ISSN1792-8788 Publisher: ThemesinScienceandTechnologyEducation.
26. R.T.Haar,“VirtualRealityintheMilitary”,applyingacognitivearchitecture to control of virtual non-player characters, Proceedings of the2004 WinterSimulationConference,883–889.
27. Ryan Yung,”New realities: a systematic literature review on virtual reality and augmented reality in tourism research”,December 2017 Current Issues in Tourism 22(1):1-26DOI:10.1080/13683500.2017.1417359.
28. Dorota Kaminska et.al, “Virtual Reality as a Tool in Mechatronics Education”,18th International Symposium on Electromagnetic Fields in Mechatronics,ElectricalandElectronicEngineeringAt:Lodz,PolandVolume:Electromagnetic Fields in Mechatronics, Electrical and Electronic Engineering(ISEF)BookofAbstracts,2017.
29. Delshi Howsalya Devi, R., Deepika, P. Performance comparison of various clustering techniques for diagnosis of breast cancer, 2015 IEEE International Conference on Computational Intelligence and Computing Research, ICCIC 2015, 2016, 7435711.
30. KundalakesiMathivanan, “study of virtual reality”, International Journal ofTrendinResearchandDevelopment,Volume4(3), ISSN: 2394-9333.
31. Laura Freina and Michela Ott, “A Literature Review on Immersive VirtualRealityinEducation:StateofTheArtand Perspectives”,simulationandgaming,33(4),441-467(2015).
32. Waqqas-ur-Rehman Butt,”Study and Analysis of Virtual Reality and itsImpact on the Current Era. Research on Automatic Generation Method ofVirtualRealitySceneandDesignofUserExperienceEvaluation”,2020International Conference onInformationScience,ParallelandDistributedSystems(ISPDS).
33. Yung,Ryan, et.al,“Newrealities:asystematicliterature review on virtualreality and augmented reality in tourism research”,CurrentIssuesinTourismon28Dec2017.
34. Álvarez A et.al,“Body posture recognition by means of a genetic fuzzy finite state machine”, In: IEEE 5th international workshop on genetic and evolutionary fuzzy systems (GEFs), 2011, pp 60–65
35. Uma Sankar G, **Saravanan D**, (2018), Single Objective for an Integer Partial Flexible Open Shop Scheduling Problem Using Developed Ant Colony Optimization, International Journal of Mechanical and Production Engineering Research and Development (IJMPERD) ISSN(P): 2249-6890; ISSN(E): 2249-8001 Vol. 8, Issue 3, Jun 2018, PP 1121-1132.
36. Vilma Roseline J, **Saravanan D**, (2019), Crossover and Mutation Strategies applied in Job Shop Scheduling Problems, Journal of Physics: Conference Series (JPCS), 1377 (2019) 012031 doi:10.1088/1742-6596/1377/1/012031Conference Proceedings.

37. Vilma Roseline J, **Saravanan D**, (2022), Hybrid Backward Production Scheduling for Manufacturing Systems, *Indian Journal of Natural Sciences, ISSN: 0976 – 099, Vol.13, Issue 75, PP 51559-51568*

38. Brooks AL et.al,"Recent advances in technologies for inclusive well-being. Virtual patients, gamification and simulation". Intelligent systems reference library series, 196, 1 edn. Springer,2021.

39. Hoffman BL et.al,"Woods MS, Primack BA (2018) Use of fictional medical television in health sciences education: a systematic review. Adv Health Sci Educ 23(1):201–216. https://doi.org/10.1007/s10459-017-9754-5.

40. Eghtesadi M. Breaking social isolation amidst covid-19: a viewpoint on improving access to technology in long-term care facilities. J Am Geriatr Soc. 2020 May;68(5):949–950. doi: 10.1111/jgs.16478. 32277470 Epub 2020 Apr 24.

41. Sutin A.R., Stephan Y., Luchetti M., Terracciano A. Loneliness and risk of dementia. J Gerontol B Psychol Sci Soc Sci. 2018 Oct 26.

42. Lara E., Caballero F.F., Rico-Uribe L.A., Olaya B., Haro J.M., Ayuso-Mateos J.L., et al. Are loneliness and social isolation associated with cognitive decline? Int J Geriatr Psychiatry. 2019 Nov;34(11):1613–1622.

43. Wang J., Mann F., Lloyd-Evans B., Ma R., Johnson S. Associations between loneliness and perceived social support and outcomes of mental health problems: a systematic review. BMC Psychiatry. 2018;18(1):156.

44. Alcaraz K.I., Eddens K.S., Blase J.L., Diver W.R., Patel A.V., Teras L.R., et al. Social isolation and mortality in US Black and White men and women. Am J Epidemiol. 2019 Jan 1;188(1):102–109.