

Augmented Reality For Abnormal Kids

Piyush Dhamdhare, Navin Kumar Singh, Himadri Biswas, Aryan Gupta, Vairamuthu S

Abstract: Augmented Reality is a general term for a gathering of advances used to mix PC produced data with a normal viewer natural sense. Since smartphones have become ubiquitous, "Augmented Reality" has been developed to run on them. AR tools utilize the devices sensors (camera input, compass, etc) and put helpful data (in a particular order) in a layer over the picture from the phone camera or webcam which, thus, is seen on the device screen. Augmented Reality has massive potential in the field of education and training. This paper shows an instructive application for some, individuals pass by abnormal kids with learning handicap without notice. Dissimilar to different incapacities like viral fever, physical problem and visual disability a learning failure is a disguised hindrance. Students with learning handicaps get down to business, go to school and college and move forward on a gainful life. It is even more so beneficial for children with learning disabilities. It makes them excited about education as the AR Scrapbook uses fun, interactive and compelling experiences. This paper is designed as a social collaborative experience. It helps in development of cognitive skills and fine motor skills. It sparks the imagination and creativity and enhances their general knowledge and vocabulary. It also intends to help children learn faster and better. This is education of the future.

Index Terms: Augmented Reality, Dyslexia, Dementia, Claustrophobia, Schizophrenia, Virtual Reality, Unity 3D.

1. INTRODUCTION

Many children across the world faced many types of diseases, and dyslexia is one of them. Dyslexia is a learning issue that includes issue scrutinizing in view of issues perceiving speech sounds and making sense of how they relate to alphabet sets and words (disentangling) [10]. Likewise called understanding handicap, dyslexia influence territories of the cerebrum that procedure language. Children with such learning disabilities only need to be taught in a particular fashion. Our current education system fails to take into consideration that there might be exceptional cases where children cannot grasp concepts like the other kids. This is the problem that our project tackles. This work is based on an Augmented Reality based App that creates 3D visuals on the phone screen when its camera is pointed at an image or text. By creating animated visual sequences, children tend to grasp concepts. While text and speech may intimidate most children in the beginning, we understand the fact that they are visual learners. Our project, leverages this fact by bridging the gap between children with learning disabilities and the current education system. Moreover, our application can also be easily integrated across various smart classrooms, so that teachers can incorporate visual-based teaching in their usual curriculum. To develop this application, we have made use of a software called "Unity 3D" and incorporated various object detection algorithms to make its functionality even more efficient.

2. LITERATURE REVIEW

Claustrophobia is a tension issue portrayed by the dread of encased spaces. In spite of the fact that medicine treatment can adequately control indications, the impacts rapidly vanish once drug is ceased. Numerous examinations have demonstrated that joining psychotherapy and drug is more adequate than exclusively utilizing prescription. In any case, the shortcomings of the conventional psychotherapy are that the time has come expending and costly. On the other hand, vivo introduction treatment is proposed in which uneasiness is continuously activated with upgrades. Focusing on claustrophobia is analysed utilizing the conventional technique, and this examination set up computer generated reality (VR) and mixed reality (another name of AR) conditions predictable with claustrophobic qualities, looking at the two utilizing a trial procedure to inspect whether VR and AR situations are similarly fit for activating tension in members [9]. This investigation further dissected the efficacies of VR and AR by estimating changes in member's pulses fluctuation (HRV) and looking at information from study polls. HRV results showed that the proposed VR framework and AR framework were both ready to trigger uneasiness. Besides, the AR condition delivered a more grounded involvement for the members and caused physiological responses more obvious than those brought about by the VR condition [1],[2]. With respect to uneasiness survey, the members proposed that their tension was altogether higher in the VR condition than in the AR condition. Augmented Reality (AR), otherwise called Mixed Reality, intends to join virtual (imaginary) and genuine scene together to accomplish that virtual ones are have a place with this present reality. Being normal for mix of imaginary and genuine scene, numerous uses of AR or mixed reality are developing, for example, In field of instruction, restorative treatment and stimulation. Extended the fact of the matter is used to update indigenous living spaces or conditions and offer perceptually pushed encounters. With the assistance of front-line Augmented Reality advancements (for example including personal computer vision and thing attestation) the data about the encompassing real universe of the client winds up natural and carefully manipulability.[11]

- Piyush Dhamdhare, B.Tech Degree in Computer Science & Engineering VIT, Vellore, India, E-mail: piyushdhamdhare16@gmail.com
- Navin Kumar Singh, B.Tech Degree in Computer Science & Engineering VIT, Vellore, India, E-mail: navinkumarsingh.613@gmail.com
- Himadri Biswas, B.Tech Degree in Computer Science & Engineering VIT, Vellore, India, E-mail: himadri.biswas2016@vitstudent.ac.in
- Aryan Gupta, B.Tech Degree in Computer Science & Engineering VIT, Vellore, India, E-mail: aryan.gupta2016@vitstudent.ac.in
- Vairamuthu S, Professor in VIT, Vellore, India, E-mail: svairamuthu@vit.ac.in

Goals of Augmented Reality:-

- To make virtual condition for a more extravagant client experience.
- To incorporate it into day by day lives to support the majority people around the world.
- To accomplish accomplishments which are constrained in genuine world.
- To upgrade creative mind of new generation.

Types of Augmented Reality:**There are two kinds of straightforward AR:**

marker-based which uses cameras and obvious signs, and marker less which utilize positional information, for example, a compass and portable's GPS.[7]

I) Marker based:

Various kinds of AR markers are pictures of any objects which our will scan and that can be perceived by phone camera or webcam and used with programming as the zone for virtual assets put in a marker. Most are highly contrasting; however, hues can be used as long duration till the differentiation between them can be appropriately perceived by phone camera or webcam. Basic mixed reality markers can comprise of at least one fundamental shape made up of dark regular shape (generally squares) against a light (generally white) foundation. Increasingly detailed markers can be made utilizing basic pictures that are still perused appropriately by a camera. In our undertaking we are utilizing Marker based Augmented reality.[4],[8] A phone camera or webcam is utilized with AR programming to recognize the AR markers for the area for your detectable object items. Outcome is a picture can be seen, stay on your device screen, object display on your screen and advanced resources are put into the scene around the area of the markers. Impediments on the sorts of AR markers that can be utilized depend on the product that remembers them. The least difficult kinds of AR markers are high contrast pictures that comprise of two-dimensional (2D) standardized tags.[11]

II) Marker-less:

In marker-less AR the picture is assembled using web and showed this on a particular area (accumulated utilizing GPS). The model under this type doesn't need a marker to show the objects. In this paper marker-based is used for implementation. Schizophrenia is a steady psychological sickness that for the most part indicates deranged reactions and impacts an individual's helpfulness. The disgrace related to this illness is a veritable obstacle for an adequate method to manage its treatment. Disgrace can, for example, delay the start of treatment, and it makes difficulties in social and capable associations. This work proposes another gadget reliant on expanded reality to decrease the disgrace related to schizophrenia. The instrument is fit for repeating the insane signs normal of schizophrenia and mirrors sense perception changes in order to make a clear experience capable of making over the top experiences of a patient with schizophrenia. The joining into the proposed condition occurs through submersion glasses and an embedded camera. Sound and improved perceptions can moreover be associated ceaselessly. To endorse the proposed condition, helpful

understudies experienced the virtual condition. Insights tolerant dementia in Malaysia demonstrated that, age assume and significant job that lead an individual to turn into a memory lost or additionally know as Dementia understanding. Dementia disease is where the patient lost the capacity to review memory 100%. Contingent upon level of dementia, this ailment may make the patient powerlessness recollect their families or indeed, even most noticeably terrible they can't grow new memory for the long-haul life. Therefore, numerous scientists have attempted to build up another choice to fix this ailment shockingly they are still nobody explicit treatment to fix this sickness. Along these lines, in this examination a new elective treatment is proposed by using Augmented Reality (AR) in the treatment [5]. This isn't intended to fix, yet to improve dementia understanding personal satisfaction. The AR framework produces a virtual item in reality utilizing checked AR framework to extend 3D picture in the patient view or LCD show. A half and half of case-based thinking will be ordering what to be show dependent on that specific patient necessity [6]. This is situated in the patient way of life. Expanding the past treatment of utilizing cell phone to make a note to remind the patient about their day by day life, expel the two-dimensional picture restriction. In view of the review convey out of 50 man 90% will incline toward 3D picture contrast with 2D picture. It is expected that this examination will diminish the memory lost between 9% to 19%. Fundamental information demonstrates that alpha wave cerebrum will increment to around 2 Hz think about the past mind wave. The patient will ready to have a decent personal satisfaction, which may ready to make another memory for a long-haul life. In current instructive frameworks 3.5% of the understudy's experiences perusing issues. Dyslexia is one of the most widely recognized learning incapacities that understudies present. It causes extreme trouble in perusing and when all is said in done in language, that requires explicit and specific instruction [3]. Since ICT's have been actualized in school classes, the fuse of them in dyslexics' training can be practiced simpler. AR is an ICT device that empowers clients to see and experience this present reality blended with different virtual articles, without losing the feeling of the real world. This apparatus can profit dyslexic understudies and their teachers since it can change the learning method into all the more invigorating and engaging. This paper comprises a writing survey concentrated on AR and its present and future consolidation in current training of dyslexic understudies, something that can give chances to increasingly intuitive and happy instructive encounters [11]. At last it displays a preliminary application that has been built for showing multi year old understudies the Greek letter "τ" and the after effects of its assessment from teachers.

3. METHODOLOGY

The steps involved in the making of the Augmented Reality Scrapbook are shown below. We have made augmented reality images for targets in the real world. The targets are to be shown in front of the AR Camera in order for it to detect the target and show the augmented reality model to the user via the camera. When a student views (through the AR camera) a picture of, for example, a boat, student will

see a 3D pop-up model of the boat, which a student can clearly analyse to fully understand how a boat really is.

- 1) Creating a Vuforia developer account, get license key and paste it in Vuforia Engine Configuration.
- 2) Choosing an image target, make sure the target has good rating (4 or 5 stars) so it can be easily distinguished by the Augmented Reality camera (which can be cell phone camera or webcam of PC).
- 3) Uploading it on Vuforia Developer Portal
- 4) Downloading it and importing it in Unity
- 5) Enable the AR camera from Vuforia section.
- 6) Adding an image target and choose target imported from Vuforia Developer account.
- 7) Import the apt 3D model/2D image for the chosen image target
- 8) Drag and drop 3D model/2D image over the target in the hierarchy panel
- 9) Click on play button and experience the 3D view of the

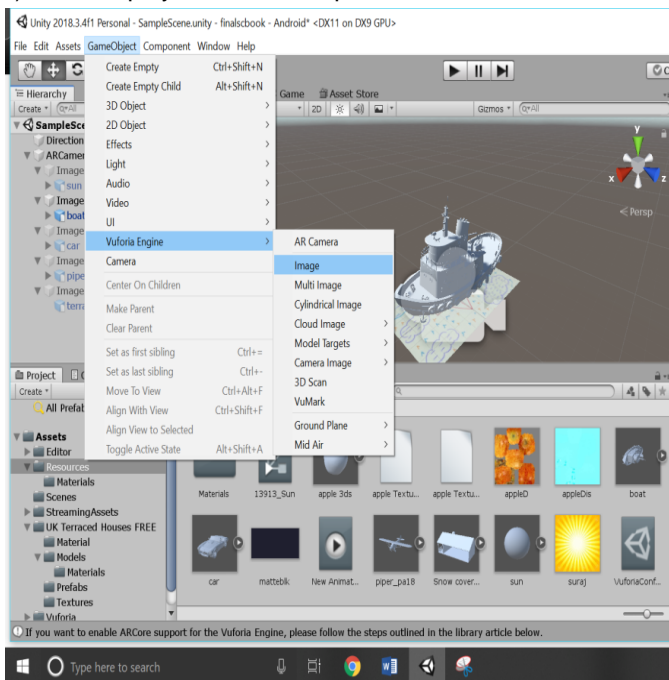


Fig. 1. Using Vuforia Engine to develop 3D image of the marker (here it is ship).

scanned model.

- 10) Additionally, we have also added virtual buttons. As the

name suggests, virtual buttons are virtual entities which when interacted (touch, hover, glide etc.) with produce a change in the augmented reality environment. We have used virtual buttons for various objects which when touched, generate an image of the same. Such that suppose a child touches (and looks through the AR camera) the screen will display a model of the thing he touched.

4. RESULT

We successfully implemented the models on the detection of markers using Unity 3D and Vuforia engine. The models are displayed below in which "Marker" is input and "Target" is resembling the output of input-

4.1 Car



Fig. 2. Marker of car (which AR camera scan)



Fig. 3. 3D Output of Car

4.2 House

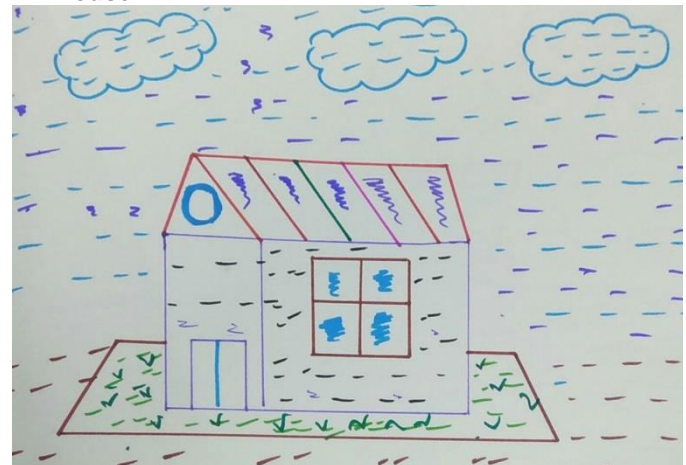


Fig. 4. Marker of house (which AR camera scan)



Fig. 5. 3D Output of House

4.3 Sun



Fig. 6. Marker of Sun (which AR camera scan)

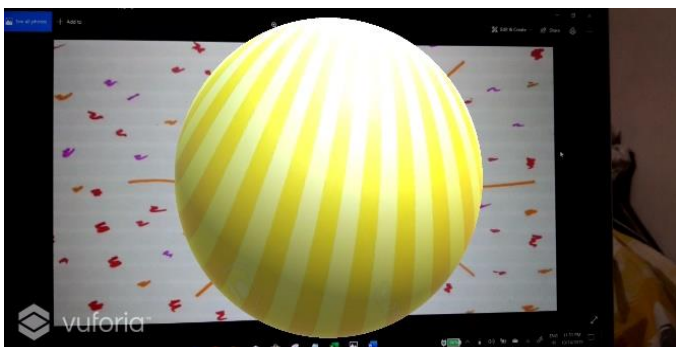


Fig. 7. 3D Output of Sun

4.4 Aeroplane



Fig. 8. Marker of Aeroplane (which AR camera scan)

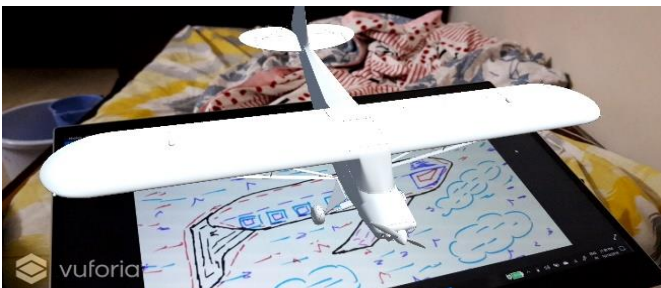


Fig. 9. 3D Output of Aeroplane

4.5 Ship



Fig. 10. Marker of Ship (which AR camera scan)

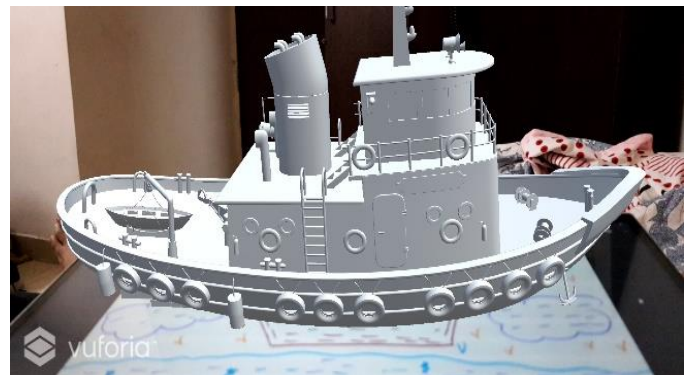


Fig. 11. 3D Output of Ship

5. CONCLUSION

This paper on “Augmented reality for abnormal kids” will prove to be a boon in the education of treating these abnormal kids and new wings to AR and VR in computer technology. And apart from this the work describe children, especially for children with learning disabilities.

1. 3D Models-

3D models are best ways to communicate and this tool can be used for demonstrations, lectures, reports, and more to autistic children.

2. Efficiency and reliability-

It makes the learning system more reliable and efficient for autistic children.

3. Ease-

These models are easy to use and highly simplistic in nature for the autistic children to understand.

4. Interactive Content

Develop interests for learning in children.

6. REFERENCES

- [1] Ronald T. Azuma, A Survey of Augmented Reality, In Presence: Teleoperators and Virtual Environments 6, 4 (August 1997), 355-385
- [2] Si Jung Jun Kim, A User Study Trends in Augmented Reality and Virtual Reality Research, 2012 International Symposium on Ubiquitous Virtual Reality.

- [3] J. E. McCarthy and S. J. Swierenga, "What we know
[4] about dyslexia and Web accessibility: A research review,"
[5] *Univers. Access Inf. Soc.*, vol. 9, no. 2, pp. 147–152, 2010.
- [6] Rencheng Sun , YiSui , RanLi , Fengjing Shao, The Design of a New Marker in Augmented Reality, 2011 International Conference on Economics and Finance Research , IPEDR vol.4 (2011) © (2011)IACSIT Press, Singapore.
- [7] O. Wasenmuller, M. Meyer, and D. Stricker, "Augmented Reality 3D Discrepancy Check in Industrial Applications," *Proc. 2016 IEEE Int. Symp. Mix. Augment. Reality, ISMAR 2016*, no. September, pp. 125–134, 2016.
- [8] Biseria and A. Rao, "Human Computer Interface-Augmented Reality," *Int. J. Eng. Sci.*, vol. 2594, no. 8, pp. 2594–2595, 2016.
- [9] V. Tiwari, V. P. Tiwari, D. Chudasama, and B. Kumkum, "Augmented Reality and Its Technologies," *Int. Res. J. Eng. Technol.*, pp. 2395–56, 2016.
- [10] Jadeja and R. Mehta, "New Era of Teaching Learning : 3D Marker Based Augmented Reality," *Int. J. Inf. Sci. Tech.*, vol. 6, no. 1/2, pp. 81–88, 2016.
- [11] S. Blanco, B. Carrión, and J. L. Lerma, "Review of
[12] Augmented Reality and Virtual Reality Techniques in Rock
[13] Art," no. October, 2016.
- [14] J. E. McCarthy and S. J. Swierenga, "What we know
[15] about dyslexia and Web accessibility: A research review,"
[16] *Univers. Access Inf. Soc.*, vol. 9, no. 2, pp. 147–152, 2010.
- [17] C. Science and M. Studies, "3D Marker Based
[18] Augmented Reality : Modern Teaching Learning," vol. 4,
[19] no. 8, pp. 25–30, 2016.