SMART NAVIGATION FOR UNFAMILIAR INDOOR LOCATION USING AUGMENTED REALITY

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Abstract - *The crisis of the global pandemic Covid 19 has led to various health care needs in the society. Scientists, research scholars, enthusiasts, developers, doctors across all nations are striving to provide support by all means.People now-a-days show more dependency on the technologies than ever before. One such thing is on navigation technologies. Navigation technologies are well enhanced with the help of wireless communications such as the GPS, bluetooth and wifi systems. Google maps for Android, Here maps for Microsoft are some of the examples that satisfy the needs for navigation. However these cannot be accurate in minute levels. To put in other words, indoor navigation is a problem, which arises as a global issue for navigation industries.*

***Key Words --* AR/MR, Baby-care, Covid19, Indoor navigation, Future Technology.**

I.   INTRODUCTION

This paper provides the solutions for problems with most of the baby-care industries succeeding a pandemic crisis like Covid 19. Of all the known pandemics so far, most of them are contagious (Spread from one to another instantly). Being that said, it is difficult to contain the disease's spread without voluntary measures and awareness among people. Technologies also play a vital role in reducing the risk factor to low. Immersive technologies like AR,VR and MR have significant role to play during such pandemics as they are capable of non physical contact(real-life contact), thereby facilitating the user to keep their distance.By, Sept 19 2020 the total active Covid 19 cases has reached over 26.5 Million world-wide for the first time in the human history.

II.   ISSUES OF A PANDEMIC

A.   *Social Distancing*

Soon after the outbreak of any contagious disease the first preventive measure to be taken is social distancing. This part of preventive measure is difficult to implement in public gathering sectors like malls, theaters, religious places and so on. This leads to the second issue to come into action (i.e, Lock down). However social distancing can be viewed and verified using deep learning algorithms in certain facilitated places. Also as an individual there are AR/MR mobile apps that can help you to maintain the distancing properly.

B.   *Lock Down*

Lock down is seen as a cruel act of government in some areas, as it denies the rights of people to a certain extent. Lock down is implemented mainly to keep social distancing in check. Certain necessary commodities like milk, petrol are available at any time. But there are also other essential commodities as well, like the diaper for babies, where parents are not able to identify the correct diaper size of the babies as the baby grows sooner in the course of time. This pandemic makes it even more difficult for both the parents as well as the baby-care industries to deal with such things.

III. IMMERSIVE TECHNOLOGIES

Immersive technologies or in other words non-reality technologies like Augmented Reality(AR), Virtual Reality(VR), Mixed Reality(MR) are becoming buzz words in the 21st century. These have found their ways in various levels of applications and are even getting more dominating than smart-phones.

A. Augmented Reality

The application of augmented reality technology is opening up new opportunities in the health-care industry. It's expected that by the year 2022, the global market will reach a value of $1.5B. New AR innovations can help enhance doctors and surgeons ability to diagnose, treat, and perform surgery on their patients more accurately by giving them access to real-time data and patient information faster, and more precisely than ever before[1]. AR can also bring huge value to practicing medicine and education by allowing students and trainee physicians to better visualize health issues and scenarios that they one day will be treating. The benefit that AR can bring to the health-care industry can be groundbreaking and we are just witnessing the beginning of what is to come from AR in the field of medicine.

Figure 1. Demo image of Smart Navi app

B. Mixed Reality

Mixed Reality makes it possible for surgeons to perform an operation on a patient thousands of miles away[6]. It makes it possible for nurses to hone their skills and perform hundreds of operations virtually before even touching a patient. Mixed Reality is making the impossible possible[2].

Mixed Reality combines the real world with the virtual to create solutions that we never thought possible. It enables effective collaboration between physical and digital objects and has found an integral place and application in health-care[3]. This blog explores some radical ways in which healthcare is using Mixed Reality for better quality treatment and customer experience[7].

C. *Virtual Reality*

health-care is one of the biggest adopters of virtual reality which encompasses surgery simulation, phobia treatment, robotic surgery and skills training[4]. One of the advantages of this technology is that it allows health-care professionals to learn new skills as well as refreshing existing ones in a safe environment[5]. Plus it allows this without causing any danger to the patients.

Figure 2. Virtual Reality in HealthCare

IV.   SMART INDOOR NAVI AR APP

Recent statistics show that indoor navigation is tedious, since the environment is much populated and it is unsafe for them to visit shops frequently[13]. And the reason for their visit mostly relies on finding suitable products in an unpredictably overcrowded indoor during the course of the first visit. To overcome this issue we have developed an AR app which is discussed in the upcoming sections.

A. *Proposed Solution*

- Developing a multi- diagnosing Navigation app to self-diagnose the path of the individuals.
- Developing an Augmented Reality-App which displays the route of the destination.
- By this methodology, we can make the users to know about the waypoints along the path by themselves, thereby, restoring their confidence and trust in the navigation based industries.
- Made use of Augmented reality and UI interface with the aid of Unity 3d game engine[11].

B. *Solution Compatibility*

a) The solution is an app which is readily available for download and installation.

b) The app is compatible with both Android as well as iOS as it makes use of Vuforia AR SDK[10].

c) The model is 87% accurate, which was concluded by a series of experiments.

C. *Solution Flow*

The only prerequisite that the user should be aware of is that the user must hold the smart-phone in a position that the head and foot of the baby exactly fits the screen of the app.This app supports every smart-phone model right from lower end to higher end[8]. This app works perfectly fine in Android versions greater than Android 4.1 (JELLYBEAN)[12].

Figure 3. Solution Flow Diagram

V. CONCLUSION

AR is in the early stages of application within health-care education but it has enormous potential for promoting learning in health-care based on this review of preliminary AR studies[9]. The infancy of AR in navigation education requires more than the testing and improvement of prototype products, but also needs to identify appropriate learning theories to better guide application of AR in navigation education[14].

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