iJRASET
International Journal For Research in Applied Science and Engineering Technology



INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 10 **Issue:** VII **Month of publication:** July 2022

DOI: https://doi.org/10.22214/ijraset.2022.45836

www.ijraset.com

Call: 08813907089 | E-mail ID: ijraset@gmail.com

International Journal for Research in Applied Science & Engineering Technology (IJRASET)
ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.538
Volume 10 Issue VII July 2022- Available at www.ijraset.com

Application Development for AR and VR devices

Roopesh M K
ISE, RVCE, Mysore Rd, RV Vidyaniketan, Post, Bengaluru, Karnataka, India 560059

Abstract: ***Artificial Reality and Virtual Reality have been the latest trends in the market. They are finding applications in almost all the sectors of the society. Augmented Reality uses CV along with tracking of the depth show the content to the user. AR is designed for unrestricted movement while projecting objects that you are looking at and changes the user's physical environment with relevant digital data in real-time. A user can experience Augmented Reality with his mobile or special hardware. Virtual Reality allow users to experience scenarios through simulated counterparts and obtain practical knowledge that would else be difficult to obtain in a real environment. Since the field of VR and AR is ever expanding, it is important to provide a very smooth and innovative experience to the end user. Therefore, application development for VR and AR devices is becoming the latest trend and there is a necessity to keep upgrading the content and experience being provided to the user.***
Keywords: Augmented reality, Virtual Reality

I. INTRODUCTION

Augmented reality and virtual reality are technologies that have been under research for many years. Even then, there are many products that are developed in that area and are made accessible to all the end users. However, due to the society's ever-changing requirements, these technologies have saturated in certain areas. Therefore, it is very important to understand the research evolution that they have had in past years and, to study the current trend to understand the areas and domains in which they would be applied in the upcoming years. Augmented reality is a more recent technology than VR and has an interdisciplinary application framework, in which, studies and learning seem to be the majority field of research. In fact, AR has supporting learning, and memory preservation, as well as on learning motivation. However, VR benefits from better and more precise fields of research areas. AR is still developing in the scientific scenarios. Virtual reality (VR) has recently come to public attention due to advances in latest immersive technology and huge investments by industrial giants like Facebook, Google etc, everyone who are developing VR and augmented reality (AR) products. It is very important to develop applications that provide great user experience to the end user and this work focuses on the same.

II. LITERATURE REVIEW

This paper [1] gives a detailed study about Augmented reality and Virtual reality and gives an insight on which is better to use according to the situation.

This paper [2] describes the trends of how user studies have been incorporated into AR and VR papers published in two major conferences over the past three years. In addition, this paper presents implications on what needs to be considered when planning a user study in the field of AR and VR research.

This paper [3], highlights top technologies for Tourism and Hospitality with regard to AR and VR.

In this paper [4], an insight is provided on the usage on Augmented Reality on humans and how it has changed over years.

This paper [5] provides the details on the evolution AR/VR technology over the past decade.

This paper [6], investigates whether virtual reality (VR) and augmented reality (AR) offers potential for the training of manual skills, such as for assembly tasks, in comparison to conventional media.

The paper [7] investigates the existing integration of innovative augmented reality (AR) technology, which has different application areas.

This paper [8], demonstrates the use of different buttons and knobs of a Cathode Ray Oscilloscope (CRO) using an application Unity 3D which makes it easier for the students to get a better understanding of the CRO and its working.

This paper [9] focuses on virtual and augmented reality applications in science and engineering.

This paper [10] analyses five different areas (Entertainment, Education, Healthcare, Automobile and Aviation) where VR is in function with the present and future development level.

In addition, this paper also presents suggestions for improvements by considering the drawbacks of this technology which could be harmful to users.

©IJRASET: All Rights are Reserved

III. METHODOLOGY

A. Architecture

The System Architecture shown in Fig. 1 below gives us an abstract overview of the entire infrastructure. Various components involved and their interaction to securely transport, process, store and provision sensitive data are shown in the given figure below. Firstly, the application is developed with all the required content being added. After that, the android apk is obtained by building the application with the target platform being set to Android. The application is then run on the VR/AR device.

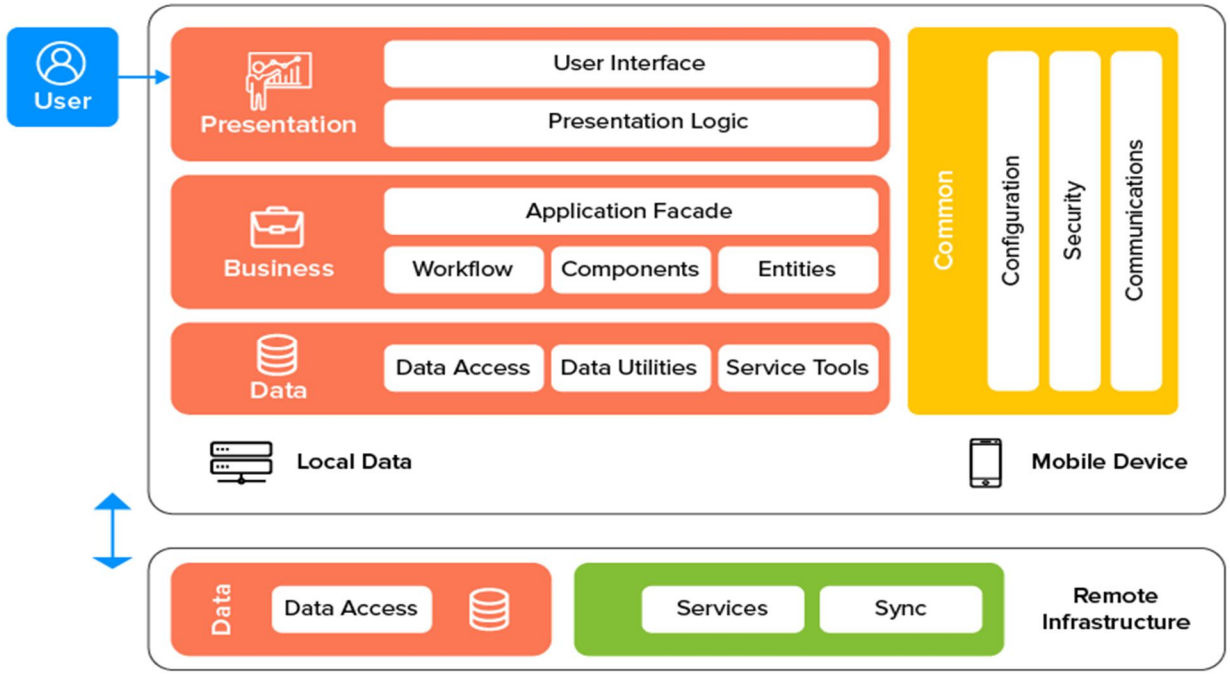


Fig. 1. Architecture diagram for building an android application for AR/VR device

B. Methodology

1) *Installing the Unity game Engine:* Initially, for the creation of the application, we need a suitable game engine. For this purpose, Unity game engine is used. Unity 2020 is used as it is the latest version with support
2) *Writing a C# code to make use of the VR camera:* Once Unity is installed, we need to ensure that a code is written to make use of the camera of the VR device. C# language is used to write this code. All the functionalities of the rendering of scenes are taken care of in this script
3) *Adding required content:* It is important to provide an innovative content to the end user. All the content is added in this step and various aspects like physics functionalities are taken care.
4) *Building the application:* Once the content is added, the application needs to be built. This is done by setting the target platform to Android.
5) *Running the application on VR device:* Once the android application is obtained, it is installed on the VR device. The content is seen and various issues like jitter, latency etc can be checked

The above summary describes the steps involved in the developing an application for AR/VR device.

IV. DATA

A. Techniques Used

For the content recognition, a player known as RVR player is used. Through this, one can clone the same content that is being displayed on the VR device

B. Data

When users view the content, it is important to ensure that the content is smooth and without any issues like judder, latency etc. For this, the content needs to be developed with utmost care and precision.

ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.538
Volume 10 Issue VII July 2022- Available at www.ijraset.com

V. RESULTS



Fig. 2. Sample output of an application having 3D character animation

Unity was chosen to develop the above application. This is because it is open source and is available easily. Also it is compatible with C# which makes it even easier to write a code for any functionalities.

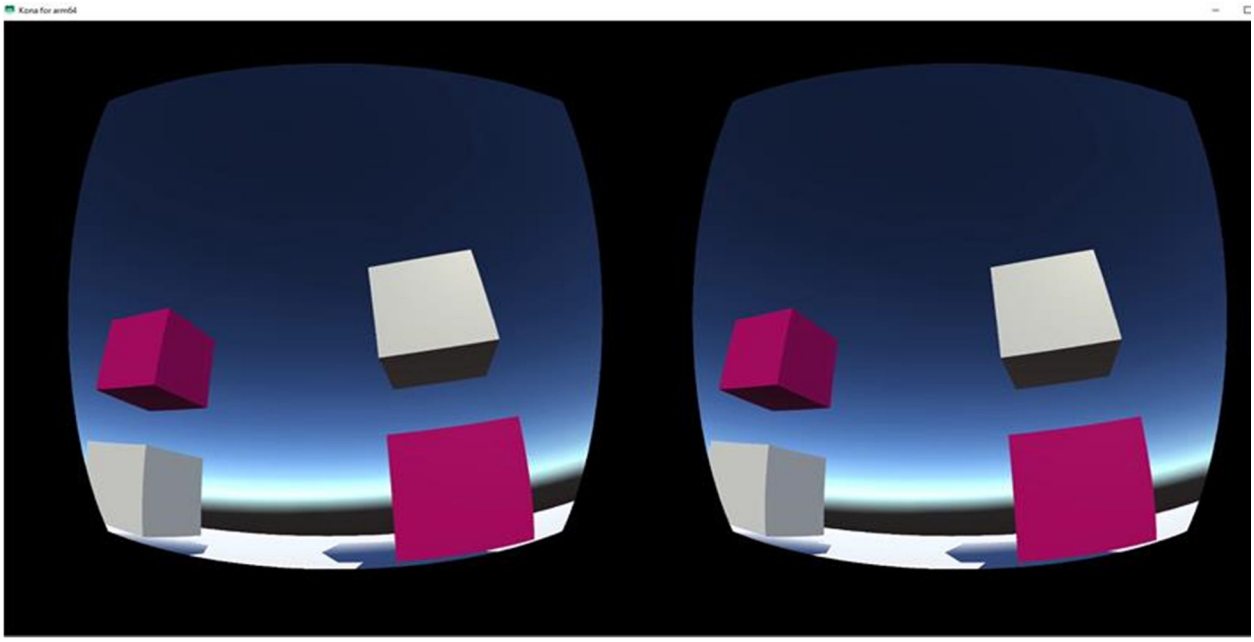


Fig. 3. Sample output of an application with split rendering

VI. FUTURE DISCUSSIONS

In the future, it is important to develop applications for all the commercial headsets like Oculus, Microsoft Holo Lens, Pico etc. For this purpose, OpenXR SDK can be used. OpenXR is a open, royalty-free standard for access to virtual reality and augmented reality platforms and devices. Using this, cross platform applications can be developed thus saving a lot of time and effort.

VII. CONCLUSION

XR is the future of mobile computing. It is a new and growing technology which has the power to completely change the way we view the gaming industry. The VR headsets and AR glasses have great scope in the future and developing applications for that has many wide doors open. It is important to develop the foundational technology required for XR, such as immersive 3D graphics, computer vision, machine learning, intuitive security, and 5G technologies.

VIII. ACKNOWLEDGMENT

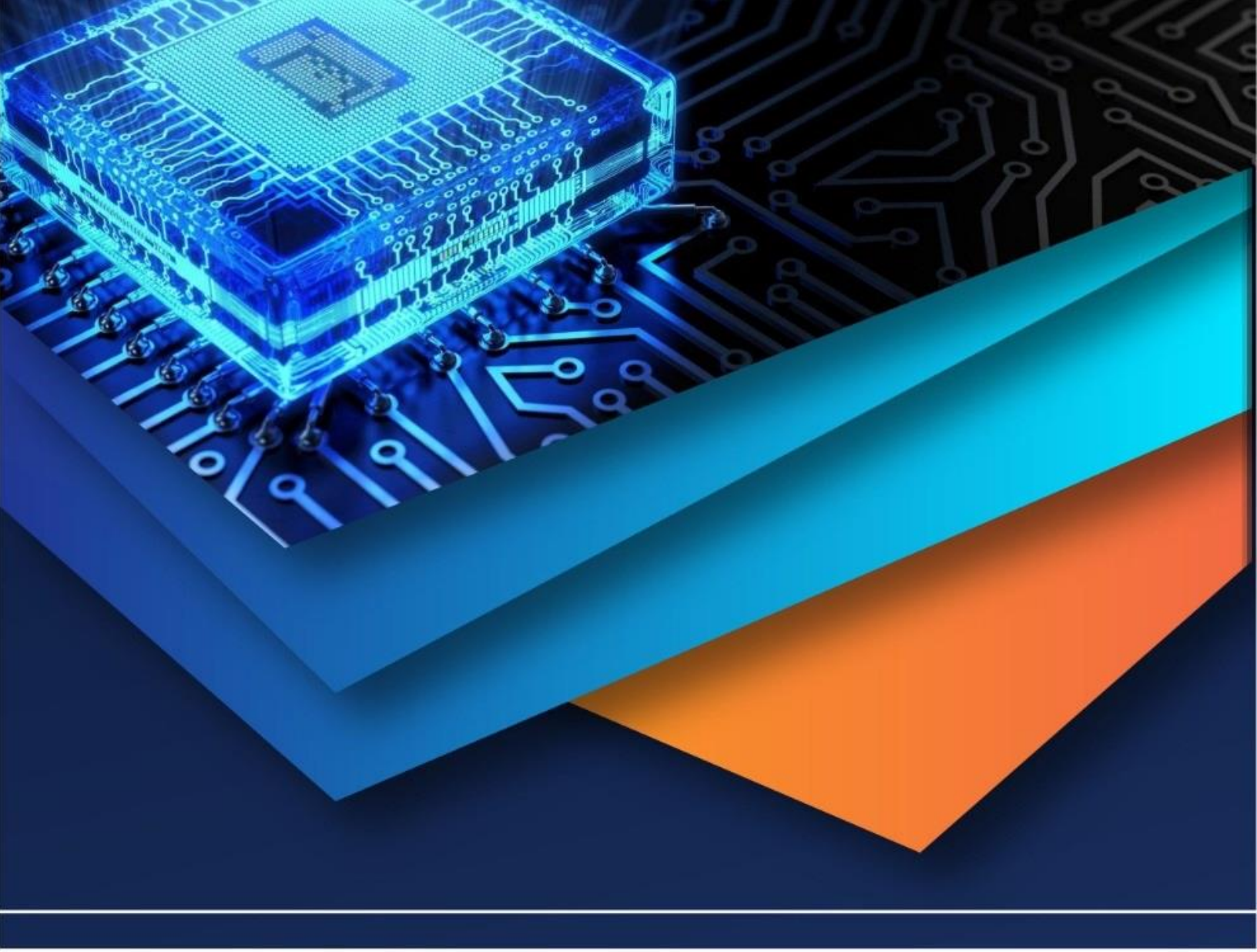
Prof. Sharadadevi Kaganurmath (Assistant Professor) was instrumental in the effective completion of this study, and the author would like to express their gratitude to them.

©IJRASET: All Rights are Reserved

REFERENCES

[1] W. Schoor, S. Masik, J. Tumler, S. Adler, M. Hofmann and E. Trostmann, "A Concept for Applying VR and AR Technologies to Support Efficient 3D Non-contact Model Digitalization," 2009 IEEE Virtual Reality Conference, 2009
[2] S. J. J. Kim, “A User Study Trends in Augmented Reality and Virtual Reality Research: A Qualitative Study with the Past Three Years of the ISMAR and IEEE VR Conference Papers”
[3] Anand Nayyar, Bandana Mahapatra, Dac-Nhuong Le, “Virtual Reality (VR) & Augmented Reality (AR) technologies for tourism and hospitality industry”
[4] J. E. Swan, J. Gabbard, D. Hix, S. Ellis and B. Adelstein, "Tutorial: Conducting human-subject experiments with virtual and augmented reality," IEEE Virtual Reality 2004.
[5] L. Rosenblum, "Virtual and augmented reality 2020," in IEEE Computer Graphics and Applications,
[6] A. C. Boud, D. J. Haniff, C. Baber and S. J. Steiner, "Virtual reality and augmented reality as a training tool for assembly tasks," 1999 IEEE International Conference on Information Visualization
[7] P. Sirohi, A. Agarwal and P. Maheshwari, "A survey on Augmented Virtual Reality: Applications and Future Directions," 2020 Seventh International Conference on Information Technology Trends (ITT), 2020
[8] H. Mishra, A. Kumar, M. Sharma, M. Singh, R. Sharma and A. Ambikapathy, "Application of Augmented Reality in the field of Virtual Labs," 2021 International Conference on Advance Computing and Innovative Technologies in Engineering (ICACITE), 2021
[9] N. Memarsadeghi and A. Varshney, "Virtual and Augmented Reality Applications in Science and Engineering," in Computing in Science & Engineering, vol. 22, no. 3, pp. 4-6, 1 May-June 2020.
[10] W. -u. -R. Butt, S. Idris and M. K. Ahmed, "Study and Analysis of Virtual Reality and its Impact on the Current Era," 2020 Seventh International Conference on Information Technology Trends (ITT), 2020.

©IJRASET: All Rights are Reserved | SJ Impact Factor 7.538 | ISRA Journal Impact Factor 7.894 |



10.22214/IJRASET

45.98

IMPACT FACTOR: 7.129

IMPACT FACTOR: 7.429

INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Call : 08813907089 (24*7 Support on Whatsapp)